GUIDE 3OF
PLANT PATHOLOGY

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Assam Agricultural University, Jorhat, Assam

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Guide book of Plant Pathology: An objective type reference book for competitive exams

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Preface

"Guide Book of Plant Pathology" is an objective type reference book, which is designed for enhancing preparedness of students to appear in various competitive exams with Plant Pathology as a subject. The book is largely the outcome of student guidance programme of Department of Plant Pathology, Assam Agricultural University, Jorhat, for appearing in various competitive examination in the discipline of Plant Pathology. With changing times and up gradation of syllabus, the question patterns of competitive examinations are also changing tremendously. Accordingly, to get success in such exams, a thorough knowledge of the subject as well as a track on question pattern and regular practice of such questions is very essential. Hence, as part of the preparation activity of the department for the students, regular exercise of framing of questions as well as their practice based on lectures provided by faculty members, guest lecturers and revision of books, was given emphasis. Here we have compiled the various questions generated during the exercises, from different books in the form of a guide book, which will be a very valuable resource for mock tests and practice for all current and future students, aspiring to crack various exams in Plant Pathology. Besides, in answer section of the book, the sources of the questions are clearly indicated, so as to enable the students for further reading and clarification.

This guidebook is a collective effort of the entire Department of Plant Pathology, AAU, Jorhat, which has been possible especially due the dedication shown by the faculty members and hard work put by the students, who went the extra mile by joining the department´s competitive exam guidance programme, attending lectures outside their regular classes, completing their assigned tasks and contributing in question framing from various chapters. We are also thankful to our guest lecturers from Division of Plant Pathology, Indian Agricultural Research Institute, New Delhi namely, Dr. Aundy Kumar, Dr. Robin Gogoi and Dr. Parimal Sinha for taking classes on various important topics, from which many questions are being incorporated in this guidebook. We acknowledge the support and guidance received from authority of Assam Agricultural University and also express our gratitude to National Agricultural Higher Education Project (NAHEP) for providing the fund for publication of this guidebook.

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Foreword

I am happy to learn that the Department of Plant Pathology, Assam Agricultural University, Jorhat has compiled an objective type reference book named "Guide Book of Plant Pathology" designed for augmenting preparation of students to appear in various competitive exams in Plant Pathology discipline. Study on various plant pathogenic microorganisms and the diseases they cause, is a fundamental aspect of agricultural sciences considering the huge losses caused by these pathogens in various crops. Many plant pathogens pose a threat to global food security, drawing attention of researchers around the globe. Research and study on Plant Pathogenic microorganisms is a fascinating field of science. However, for students aspiring for higher education in Plant Pathology as well as for positions in academics or research, appearing in competitive examinations has become indispensable. To achieve success in such exams, a thorough knowledge of the subject as well as a regular revision and practice are very essential. Hence, the compiled guide book is a timely step in the right direction and will be a very valuable resource for mock tests and practice for all current and future students, aspiring to crack various exams in Plant Pathology.

I compliment the editors and all contributors for their sincere effort in bringing out this publication.

(Bidyut C. Deka)

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CHAPTER 1
HISTORY OF PLANT PATHOLOGY

1. First authentic records of plant diseases are found in the writings of
   A. Theophrastus B. Leeuwenhoek
   C. Micheli D. Person
2. Binomial system of nomenclature to fungi was given by
   A. Theophrastus B. Leeuwenhoek
   C. Micheli D. Person and Fries
3. The physiological era of Plant Pathology was initiated by De Bary while working with the disease
   A. Late blight of potato B. Coffee rust
   C. Sclerotinia rot of carrots D. Wilt of tomato
4. The first book on Plant Pathology was written by
   A. Kuhn B. Brefeld
   C. Millardet D. Robert Koc
5. The methods of chemical control of plant diseases was initiated by
   A. Millardet B. Prevost
   C. Burril D. Brefeld
6. Phytobacteriology was initially summarized in the book "Bacteria in Relation to Plant Diseases" written by
   A. Smith B. Burill
   C. Braun D. Holmes
7. Transformation of plant cells by the bacterial pathogen *Agrobacterium tumefaciens* was proved by
   A. Smith B. Burill
   C. Braun and Pringle D. Holmes
8. Cross protection was studied in tomato infected with virus
   A. Mc Kinney B. Bawden
   C. Stanley D. Homes
9. Elucidation of rod shaped structure of TMV was done by
   A. Mc Kinney B. Bawden
   C. Stanley D. Rosalind Franklin
10. The first avirulence gene was cloned by Staskawicz from
   A. *Pseudomonas syringe* pv. *glycinea*
   B. *Pseudomonas syringe* pv. *phaseolica*

C. *Pseudomonas syringe* pv. *tomato*
D. *Xanthomonas oryzae* pv. *Oryzae*

11. The first fungal avirulence gene was cloned from *Cladosporium fulvum.* The gene is
A. Avr10 B. Avr7
C. Avr9 D. Avr8

12. The cloning of first resistance gene *HM1* from maize confers resistance to the pathogens
A. Cochliobolus carborum B. Helminthosporium
C. Rhizoctonia D. Alternaria

13. The large gene cluster, hrp region was identified for the first time in *Ralstonia solanacearum* by
A. De wilt B. Staskawicz
C. Johal and Briggs D. Gigsegen

14. The only plant genes encoding resistance to plant viruses are
A. N gene from nicotiana B. Rx gene from potato
C. Both a and b D. None of a and b

15. The first group of organic fungicide discovered was
A. Alkyl diothiacarbamates B. Phenylamides
C. Strobulin D. SBI

16. Walker discovered the role of phenols in protection and defense with the discovery of two phenolic compounds in
A. Catechol and protocatechuic acid in pink tomato bulbs
B. Catechol and protocatechuic acid in white tomato bulbs
C. Flavanoids and salicyclic acid in pink tomato bulbs
D. Tannin and salicyclic acid in pink tomato bulbs

17. The phytoalexin concept was first studied in potato and proposed by
A. Ward B. Stackman
C. Perrin D. Muller and Borger

18. Who coined the term Induced Systemic Resistance
A. Ross B. Van Peer
C. Stakman D. Orton

19. The concept of inoculum potential was consolidated by
A. Waksman B. Klopper
C. Garrett D. Hiltner

20. Rhizospheric organisms were classified as *Harmful* and *Beneficial* ny
A. Waksman B. Dommergues
C. Garrett D. Hiltner

21. Who first reported fire blight of Apple?
A. Smith B. Robert Koch
C. T.J. Burril D. M. W. Beijerinck

22. Who is regarded as the 'Father of microbial Ecology'?
A. M. W. Beijerinck B. Louis Pasteur
C. Antoni van Leewenhock D. Robert Koch
23. Who is the Father of Indian Phytobacteriology?
A. M.C. Srinivasan B. Makanji Kalyanji Patel
C. K.C. Mehta D. M.K. Hingorani
24. Who coined the term 'Rhizosphere'?
A. Ernst Haeckel B. W. J. Dowson
C. M.S. Woronin D. Lorenz Hiltner
25. First person to coin the generic name *Xanthomonas*?
A. W. J. Dowson B. M. W. Beijerinck
C. M.C. Srinivasan D. Ernst Haeckel
26. Robert Koch is credited for establishment of etiology of which bacterium?
A. Streptomyces rimosus *B. Penicillium notatum*
C. Bacillus anthracis D. none of the above
27. Who is regarded as the Father of Modern Bacteriology?
A. Louis Pasteur B. Robert Koch
C. Antoni van Leewenhock D. F. Smith
28. Who coined the term 'Genophore'?
A. G.S. Shekhawat B. Oswald T. Avery
C. Hans Ris D. M. Webb
29. *Streptomyces scabies* is a?
A. Soil inhabitants B. soil borne
C. Soil invaders D. none of the above
30. One gene one enzyme hypothesis given by?
A. L. R. Tulsane and C. Tulsane B. G. Beadle and E. Tatum
C. C.L. Shear and B.D. Dodge D. H.H. Hotson and V.M. Cutter
31. First person to stain the bacteria?
A. Christian gram B. Carl Weigert
C. Joseph W. Kloepper D. Selman Abraham Waksman
32. In which year Dr.Loeffler first succeeded in staining the flagella in different microorganism including bacteria?
A. 1876 B. 1889
C. 1901 D. 1898
33. Who coined the term Plasmid?
A. Oswald T. Avery B. Lederberg
C. Hans Ris D. M. Webb
34. Bacterial conjugation is discovered by?
A. Joshua Lederberg and Edward Tatum
B. Jacob, S. Brenner and F. Cuzin
C. L. R. Tulsane and C. Tulsane

D. W Twort and F. de Herelle

35. Who invented compound microscope?
A. R.Hooke B. Knoll
C. Antoni van Leewenhock D. Z Jensen

36. Who discovered yeast (*Saccharomyces cerevisiae)* was responsible for alcoholic fermentation?
A. M.J. Schleiden B. T Schwann
C. P.A. Micheli D. A.F. Blakeslee

37. Bacteriophage was first described by?
A. Joshua Lederberg and Edward Tatum
B. Jacob, S. Brenner and F. Cuzin
C. L. R. Tulsane and C. Tulsane
D. W Twort and F. de Herelle

38. The fungal cause of Late Blight of Potato was established by?
A. P.A. Micheli B. H.A Ward
C. Brefeld D. Anton Heinrich de Bary

39. Heterothalism was first discovered in *Mucormucedo* by?
A. Hese B. H. Burgeff
C. Blakeslee D. C.H. Blackley

40. Millardet accidental discovery of Bordeaux mixture is related to which disease?
A. Downy mildew of grapes B. Powdery mildew of grapes
C. Anthracnose of grapes D. Blight of grapes

41. " *Nova Plantarum Genera"* was published by-
A. P.A. Michelli B. Thoullier
C. Matheiu Tillet D. CH Persoon

42. Who gave the concept of genus as a taxonomic category above the rank of species and is called the precursor of Modern Botany?
A. Porta B. Malpighi
C. Tournefort D. Leeuwenhoek

43. A theory that the fungi were composed of aggregations of "zoophytes" which separated out when soaked in water was proposed by?
A. F.T.Kutzing B. O'van Muenchhausen
C. L.R.Tulsane D. Cagniard de la Tour

44. Who demonstrated experimentally that the bunt of wheat was contagious and thought that the spores contained a poisonous entity?
A. Matheiu Tillet B. B.Prevost
C. E.M.Fries D. CH Persoon

45. Who gave the first experimental proof that bunt of wheat was caused by a fungus?
A. B. Prevost B. CH Persoon
C. MJ Berkley D. E.M.Fries

46. Who is known as the Linnaeus of Mycology?
A. Linnaeus B. E.M.Fries
C. Anton de Bary D. Oscar Brefeld

47 . Who wrote "*Synopsis Methodica Fungurum"*?
A. C.H. Persoon B. Benedict Prevost
C. E.M.Fries D. Montagne

48. Who wrote "*Systema Mycologicum*"?
A. E.M.Fries B. C.H.Persoon
C. B.Prevost D. M.Tillet

49. Who is called the reconstructor of mycology?
A. Charles Tulasne B. Louis Rene Tulasne
C. Corda D. Anton de Bary

50. Polymorphism in fungi was given by –
A. Fuckel B. Woronin
C. Tulsane brothers D. P.A.Saccardo

51. Who initiated the physiological era in plant pathology?
A. H.M.Ward B. Anton de Bary
C. E.F.Smith D. Antony van Leeuwenhoek

52. Anton de Bary is called the-
A. Father of Plant Pathology B. Founder of Modern Mycology
C. Both (a) and (b) D. Father of Modern Plant Pathology

53. Anton de Bary, initiated the " Physiological Plant Pathology" with the fungus –
A. Phytophthora infestansB. Plasmapora viticola
C. Botrytis cinerea D. Mucor pusulis

54. Heteroecism in rusts especially in *Puccinia graminis triticina* was discovered by-
A. C.J. Alexopoulus B. M.K.Patel
C. P.A.Saccardo D. Anton de Bary

55. The famous massive 25 volume work, "*The Sylloge Fungorum Omnium Hucusque Cognitorum*" was done by-
A. P.A.Saccardo B. P.A.Michelli
C. Anton de Bary D. Tulsane brothers

56. The scientist who wrote the first book on Plant Pathology in 1858, was-
A. Anton de Bary B. Julius Gotthelf Kuhn
C. Pier Antonio Micheli D. E.J.Buttler

57. Germ theory of disease was given by –
A. Robert Koch B. Louis Pasteur
C. J. Von. Liebig D. Brefeld

58. Who developed the pure culture technique for isolation and culturing of fungi?
A. Woronin B. Oscar Brefeld

C. WG Farlow D. R.H.Bifen

59. Who emphasized the role of environment in the epidemiology of coffee rust?
A. W.A. Orton B. Frank
C. H.M.Ward D. W.G.Farlow

60. Who created the fungal group "Fungi Imperfecti"?
A. Fuckel in 1869 B. Oscar Brefeld in 1880
C. P.A.Saccardo D. A.H.R. Buller in 1931

61. Grouping of the living domains into two major empires, namely prokaryotes and the eukaryotes was done by-
A. Linnaeus B. Edouward Chatton
C. Copeland D. Haeckel

62. The Roman emperor Claudius Ceaser was murdered by his wife in 54 A.D. by mixing his food with the decoction of the fungus known as-
A. Claveceps purpurea *B. Aspergillus flavus*
C. Amanita Phalloides *D. Amanita miscaria*

63. The first edition of Bergey's Manual of Determinative bacteriology was published in
A. 1923 B. 1925
C. 1927 D. 1930

64. Who is known as the Father of Plant Pathology?
A. Anton De Bary B. Julius Gotthelf Kuhn
C. Joseph Berkeley D. Elias Magnus Fries

65. Who is the first person to use carbon disulphide for soil fumigation and is aptly called Father of soil fumigation?
A. Oscar Brefeld B. Harry Marshall Ward
C. Albert Bernard Frank D. Arnaud Paul Edmond Thenard

66. Millardet accidentally discovered Bordeaux Mixture in 1885 for control of
A. Powdery Mildew of Grapes
B. Downy Mildew of Grapes
C. Powdery Mildew of Cucurbits
D. Downy Mildew of Cucurbits

67. Burgundy mixture, a substitute for Bordeaux mixture was introduced by _____ in the year _____.
A. Erikson, 1894 B. Woronin, 1878
C. Mason, 1887 D. Jensen, 1887

68. Crown gall bacterium transforms normal plant cells into tumor cells by introducing into them its
A. Cosmid B. Plasmid
C. Enzymes D. Cytoplasma

69. The credit for a detailed study of the late blight fungus, its nomenclature and experimental proof of organisms being plant pathogen goes to the work of
A. Prevost B. Brefeld
C. Anton de bary D. Jones

70. Bary in 1886 reported the role of enzymes and toxins in tissue degradation caused by
A. *Rasltonia solanecearum* B. *Phytopthora infestans*
C. *Sclerotinia sclerotiorum* D. *Tilletia tritici*

71. In 1905, Jones reported the role of _____ in soft rots caused by bacteria.
A. Pectic enzymes B. Cytolytic enzymes
C. Toxins D. None of the above

72. The phenomenon of variability among fungi was first discovered by Erickson in 1894 when he reported
A. Physiologic races in rust fungi B. Physiologic races in smut fungi
C. Physiologic races in powdery mildew fungi
D. Physiologic races of bunt fungi

73. Flor in 1946 advanced the gene for gene concept of disease resistance and susceptibility while working on
A. *Melampsora lini* B. *Fusarium oxysporum*
C. *Sclerotium rolfsii* D. *Puccinia graminis tritici*

74. Phytoalexins as antimicrobial compounds synthesized and accumulating at sites of infection or stress was first defined by A. K. O. Muller and H. Borger
B. E. C. Stakman C. Persoon and Fries
D. Benedict Prevost

75. Biological specificity of disease agents was demonstrated by
A. Louis Pasteur B. T.J Burrill
C. Robert Koch D. Alfred Fischer

76. In 1952, Pontecorvo and Roper discovered parasexuality in
A. *Aspergillus nidulans* B. *Aspergillus niger*
C. *Aspergillus flavus* D. *Aspergillus fumigatus*

77. In 1953, Luthra developed solar heat treatment for
A. Flag smut of wheat B. Wheat loose smut
C. Loose smut of barley D. Loose smut of sorghum

78. The term systemic acquired resistance (SAR) was coined by
A. Ross, 1961 B. Kulka, 1965
C. Garett, 1970 D. Luthra, 1953

79. Founder of vertical and horizontal resistance in crop plants and coined the term "Vertifolia effect"
A. Vanderplank B. Kittleson
C. Biffen D. Flor

80. The term coined by Vanderplank that describes the loss of horizontal resistance during its continuous breeding for vertical resistance in the german potato variety "Vertifolia" with late blight resistance is
A. Vanderplank effect B. Placebo effect
C. Vertifolia effect D. Domino effect

81. Who is considered as the Father of Biological control?
A. Garett B. Sanford and Broadfort
C. Mundkar D. Borlaug

82. First axenic culture of obligate parasite was performed in Puccinia graministritici by
A. Williams *et al*., 1968 B. Waksman, 1966
C. Kittleson, 1952 D. Pontecorvo and Roper, 1952

83. Priestley proposed the term "boom and bust" cycle in the year
A. 1978 B. 1970
C. 1980 D. 1988

84. Pathogenesis Related (PR) proteins were first detected and defined by
A. S. Nagarajan and H. Singh
B. A. D. Cunningham and A.Barclay
C. Van Loon and Van Kammen
D. Van Loon Bakker and Pieterse

85. Who is regarded as the Father of Soil Solarization?
A. Priestley B. Waksman
C. Jacov Katan D. Weindling

86. Who coined the term plasmid?
A. Klement B. Stolp
C. Leaderberg D. Clayton

87. _____ was awarded the Nobel Prize in Physiology of Medicine in recognition for his discovery of antibiotic streptomycin from *Streptomyces griseus.*
A. Woolley *et al*., 1952 B. Selman A. Waksman,1944
C. M.K Hingorani,1952 D. Z. Klement,1964

88. The complex nature of tundu disease of wheat caused by bacterium and a nematode was reported by
A. M.K Hingorani B. E.F Smith
C. H.Stolp D. M.K Patel

89. The pathovar system in the taxonomy of plant pathogenic bacteria was introduced by D.W Dye *et al*. in the year
A. 1980 B. 1981
C. 1979 D. 1970

90. Pholem limited bacteria was observed first from clover and periwinkle plants affected by club disease by
A. Goheen *et al*. B. D. Lafleche and J. M. Bove
C. Hopkins *et al*. D. Hutchins

91. In 1973, the ratoon stunting disease of sugarcane is caused by Rickettsia like bacterium was reported by
A. Hopkins B. Doi and Ishie
C. Davies et al. D. Maramorosch

92. _____, a book written by Surpal during 11th Century in ancient India is the first book exclusively devoted to diseases of plants.
A. Vraksha Ayurveda
B. Atharveda
C. Artha Shastra
D. Shusruta Samhita

93. Who is known as the Reconstructor of Mycology?
A. L. R. Tulasne B. Charles Tulasne
C. Miles Joseph Berkeley D. Anton De Bary

94. Who investigated life cycle of potato late blight, grape mildew, wheat rust and hop mildew and gave the name *Oidium tuckerii* to grape mildew fungus?
A. Heinrich Anton De Bary B. Vonmartius and Morren
C. Julius Gotthelf Kuhn D. Miles Joseph Berkeley

95. The terms symbiosis and teleutospores were coined by
A. Heinrich Anton de Bary
B. Vonmartius and Morren
C. Julius Gotthelf Kuhn
D. Miles Joseph Berkeley

96. Synopsis methodica fungorum was published by Christian Hendrik Persoon for the nomenclature of
A. Uredinales B. Ustilaginales
C. Gasteriomycetes D. All of the above

97. In 1904, Blakeslee founded heterothallism in
A. *Mucor* B. *Rhizopus*
C. *Agaricus* D. *Pezziza*

98. Who is considered as the pioneer in apical meristem culture to eliminate viruses?
A. Teakle B. Kassanis
C. Kausche D. Hutchins

99. Who defined plant diseases as abnormal changes in physiological processes which disturb the normal activity of the plant organ??
A. Julius Kuhn B. H.M Ward
C. E.J Butler D. Wheeler

100. Teakle first reported the transmission bof TMV by the zoospores of
A. *Olpidium brassicae* B. *Phytopthora parasitica*
C. *Sclerotium rolfsii* D. None of the above

101. Hansen and Smith in 1932 demonstrated the origin of physiological races through
A. Karyokinesis B. Heterokaryosis
C. Cytokinesis D. None of the above

102. The book 'The Nature of Plants', was written by
A. Aristotle B. Theophrastus
C. Linneaus D. Democritus

103. _____is the first plant pathogen to be recognized as such and the first pathogen for which a cultural control was recommended by Albertus Magnus
A. Mistletoe B. Loranthus
C. Viscum D. None of the above

104. The germ theory according to which microorganisms were produced from pre existing microorganisms and that most infectious diseases were caused by germs was established by
A.Robert Koch B.J.C Luthra
C.Louis Pasteur D.Anton de Bary

105. The first book on plant pathology by Kuhn was
A. Diseases of Cultivated Crops, Their Causes and Their Control
B. Fungi and Plant Diseases
C. Introduction to Bacterial Diseases of Plants
D. None of the above

106. Who found that the crystalline nature of the virus contains nucleic acid and protein?
A. Stanley B. Bawden and Pirie
C. Ivanowski D. Beijerinck

107. Murray and Stackebrandt suggested _____ designation for the properties of uncultured microorganism.
A. Liberibacter *B. Wolbachia*
C. Carsonella *D. Candidatus*

108. _____ initiated 'Biochemical nature of virus' and was awarded with Nobel Prize in 1935 for crystallizing tobacco mosaic virus.
A. Mckinney B. W.M Stanley
C. Kassanis D. Kausche

109. Who reported the first nematode associated disease in crops?
A. Needham B. Devaine
C. Atkinson D. Hewit

110. Hunger showed that bacterial wilt of tomato was facilitated by
A. Root-knot Nematodes B. Cyst Nematodes
C. Root Lesion Nematodes D. The Burrowing Nematode

111. The first plant disease associated spiroplasmaSpiroplasmacitri was grown by
A. Mckinney B. Davies et al.
C. Kassanis D. Maramorosch

112. Nocard and Roux discovered another agent of diseases caused in animals which was similar to viruses in size but which could be cultured on artificial media.This group was known as
A. Mycoplasma B. Spiroplasma
C. Protozoa D. Fastidious bacteria

113. The first bacterial toxin, tabtoxin was isolated from
A. *Pseudomonas tabaci* B. *Streptomyces griseus*
C. *Erwinia amylovora* D. *Xanthomonas oryzae*

114. In 1876, Koch identified _____*Bacillus anthracis*, as the first bacterium to cause disease in animals and humans.
A. *Bacillus thuringiensis* B. *Bacillus subtilis*
C. *Bacillus megaterium* D. *Bacillus anthracis*

115. The first bacterial toxin,tabtoxin was isolated in pure form by
A. Mckinney B. Davies *et al*.
C. Woolley *et al*. D. Maramorosch

116. Ishie observed that MLOs temporarily disappeared when the plants are treated with _____ antibodies.
A. Tetracycline B. Streptomycin
C. Penicillin D. None of the above

117. Diener and Raymer discovered that potato spindle tuber was caused by viroid in which year?
A. 1981 B. 1971
C. 1982 D. 1972

118. Stahel found that the flagellates causing phloem necrosis are present in the _____ of coffee trees.
A. Pholem vessel B. Xylem vessel
C. Both D. None of the above

119. New genus executed by Donovon for the flagellate protozoan in the non latex bearing host plants is
A. *Pseudomonas* B. *Xanthomonas*
C. *Phytomonas* D. None of the above

120. The causative agent for the cadang-cadang disease in coconut as viroid was confirmed by
A. Needham B. Diener
C. Raymer D. Imperial *et al*.

121. Who reported the associations of root knot nematode with the Fusarium wilt of cotton?
A. Needham B. Hunger
C. Hewit D. Atkinson

122. The double stranded (ds) DNA virus in cauliflower was discovered by
A. Teakle B. Kassanis
C. Shepherd D. Both A & B

123. Puccina path of black stem rust of wheat in India was defined by
A. S. Nagarajan and L. M. Joshi B. Van Loon Bakker and Pierterse
C. S. Nagarajan and H. Singh D. Van Loon and Van Kammen

124. Systemic fungicides were discovered in
A. 1897 B. 1934
C. 1966 D. 1987

125. The first systemic fungicides that were developed in 1966 were
A. Carboxin B. Oxycarboxin
C. Benzimidazoles D. Both A & B

126. In 1632-1723, - - - - - - discovered the bacteria and also saw the yeast under the simple microscope.
A. Leeuwenhoek B. Hooke
C. Micheli D. Van Sterbeeck

127. Who is referred as the reconstructor of Mycology?
A. De Barry B. Fuckel
C. Tulasne Brothers D. L R Tulasne

128. What is the first eukaryotic organism which genome was sequenced?
A. Saccharomyces cerevisiae *B. Compressus parvus*
C. Xylaria hypoxylon *D. Aspergillus nidulans*

129. The structure of plant cell was elucidated by
A. Mandles B. Reese
C. Kirk D. Albersheim

130. The power of bipolar and tetrapolar heterothallism in ensuring out breeding is well known. Heterothallism was discovered by
A. A. F. Blakeslee B. Beadle
C. Kirk D. Waksman

31. _____gave the concept of genus as a taxonomic category above the rank of species and is called the precursor of modern Botany?
A. Leeuwenhoek B. Tournefort
C. Hooke D. Linnaeus

132. 'Plant Pathology' written by–
A. RS Singh B. Agrios
C. VS Singh D. AP Sinha

133. Who discovered the downy mildew for the first time in India?

A. EJ Butler B. JF Dastur

C. B B Mundakur D. KR Kirtikar

134. The Bordeaux mixture was discovered by Millardet at Boardeaux in France in year–

A. 1807 B. 1885

C. 1905 D. 1936

135. Who did most of his work on rust diseases in India

A. R Prasad B. KC Mehta

C. BB Mundakur D. EJ Butler

136. Who discovered the Dual nature of Lichens?

A. Schwendener B. EJ Butler

C. JF Dastur D. KR Kirtikar

137. The germ theory of diseases was established by,

A. Robert Koch B. Louis Pasteur

C. De Bary D. None of them

138. The first antibiotic, reported by---_____ was Penicillin produced by a fungus, *Penicillium notatum*

A. Alexander Fleming B. S. A. Waksman

C. C. Thom D. D Barry

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HISTORY

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2. Ans: D. Persoon and Fries Source: Modern Plant Pathology H. C. Dube, Page No: 1
3. Ans: C. Sclerotinia rot of Carrots Source: Modern Plant Pathology H. C. Dube, Page No: 3
4. Ans: A. Kuhn Source: Modern Plant Pathology H. C. Dube, Page No: 4
5. Ans: B. Prevost in 1805 Source: Modern Plant Pathology H. C. Dube, Page No: 4
6. Ans: A. Smith Source: Modern Plant Pathology H. C. Dube, Page No: 6
7. Ans: C. Braun and Pringle Source: Modern Plant Pathology H. C. Dube, Page No: 6
8. Ans: A. Mc Kinney Source: Modern Plant Pathology H. C. Dube, Page No: 7
9. Ans: D. Rosalind Franklin Source: Modern Plant Pathology H. C. Dube, Page No: 8
10. Ans: A .Pseudomonas *syringae* pv.*glycinea* Source: Modern plant Pathology H. C. Dube, Page No: 12
11. Ans: C. Avr 9 Source: Modern Plant Pathology H. C. Dube, Page No: 12
12. Ans: A.*Cochliobolus carbonum* race 1 Source: Modern Plant Pathology H. C. Dube, Page No: 12
13. Ans: D. Gigsegen Source: Modern Plant Pathology H. C. Dube, Page No: 12
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15. Ans: A. Alkyl dithiocarbamates Source: Modern Plant Pathology H. C. Dube, Page No: 13
16. Ans: A. Catechol & Protocatechuic acid in pink onion bulbs Source: Modern Plant Pathology H. C. Dube, Page No: 14
17. Ans: D. Muller and Borger Source: Modern Plant Pathology H. C. Dube, Page No: 14
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19. Ans: C. Garrett Source: Modern Plant Pathology H. C. Dube, Page No: 16
20. Ans: B. Dommergues Source: Modern Plant Pathology H. C. Dube, Page No: 17
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22. Ans: A. M. W. Beijerinck Source: Plant Bacteriology by K K Mondal, Page No: 6)
23. Ans: B. Makanji Kalyanji Patel Source: Plant Bacteriology by K K Mondal, Page No: 6)
24. Ans: D. Lorenz Hiltner Source: Plant Bacteriology by K K Mondal, Page No: 6)

25. Ans: A.W. J. Dawson Soruce: Plant Bacteriology by K K Mondal; Page No: 8)
26. Ans: C. *Bacillus anthraci* Source: Plant Bacteriology by K K Mondal; Page No: 5)
27. Ans: A. Louis Pasteur Source: Plant Bacteriology by K KMondal; Page No: 4)
28. Ans: C. Hans Ris Source: Plant Bacteriology by K KMondal; Page No: 12)
29. Ans: A. Soil inhabitants Source: Plant Pathology at glance by Utpal Kumar Bhattacharyya; Page No: 95)
30. Ans: B. G. Beadle and E. Tatum Source: An Introduction to Mycology by Aneeja & Mehrotra; Page No: 51)
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32. Ans: B. 1889 Source: Plant Bacteriology by K K Mondal; Page No: 17)
33. Ans: B. Lederberg Source: Plant Bacteriology by K K Mondal; Page No: 87)
34. Ans: A. Joshua Lederberg and Edward Tatum Source: Plant Bacteriology by K K Mondal; Page No: 89)
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37. Ans: D. F.W Twort and F. de Herelle Source: Plant Bacteriology by K K Mondal; Page No: 105)
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41. (Ans: A. P.A. Michelli Source: HC Dube, An Introduction to Fungi, Page No: 3)
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44. (Ans: A. Matheiu Tillet Source: HC Dube, Modern Plant Pathology, Page No: 2)
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57. (Ans: B. Louis Pasteur Source: HC Dube, An Introduction to Fungi, Page No: 7)
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62. (Ans: C. Amanita Phalloides Source: H.C.Dube, A Textbook of Fungi, Bacteria and Viruses, Page No: 8)
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64. (Ans: B. Julius Gotthelf Kuhn Source: Fundamentals of Phytopathology-Alice and Jayalakshmi, Page No:7)
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67. (Ans: C. Masson, 1887 Source:Fundamentals of Phytopathology-Alice and Jayalakshmi, Page No:8)
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71. (Ans: B. Cytolytic enzymes Source: Introduction to Principles of Plant Pathology-R.S Singh; Page No:17)
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98. (Ans: B. Kassanis Source: Fundamentals of Phytopathology-Alice and Jayalakshmi, Page No:15)
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100. (Ans: A. *Olpidium brassicae* Source:Fundamentals of Phytopathology-Alice and Jeyalakshmi, Page No:15)
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CHAPTER 2

INTRODUCTION TO PLANT PATHOLOGY

1. Assertion : Powdery mildews are generally prevalent in dry areas
   Reason : powdery mildew spore germination is inhibited by free water
   A. a & r correct, r explains a B. a & r correct, r doesn't explain a
   C. a is wrong r is correct D. a is correct, r is wrong
2. Potato scab disease is more severe in
   A. Wet soil B. Dry soil
   C. Humid weather D. Dry weather
3. Favorable conditions for club root of crucifers
   A. High moisture throughout the life cycle
   B. High moisture in the early stages
   C. High moisture in the later stages
   D. None of the above
4. Fusarium cotton wilt occurs in _____ soils in India
   A. Alluvial soil B. Laterite soil
   C. Red soil D. Black soil
5. The concept of "saprophytic ability" is given by
   A. Garrett B. Gaumann
   C. Dimond and Horsefall D. Jones
6. Capacity of a lant to invade and grow in its host plant and to reproduce on or in it
   A. Pathogenicity B. Virulence
   C. Aggressiveness D. Infection
7. The period from spore landing until the parasitized tissue produces new spores in known as
   A. Incubation period B. Latent period
   C. Quiescent period D. Both B and C
8. First plant disease regulatory legislation in the world was given by
   A. French government B. US government
   C. German government D. UK government
9. Germination of zoospores of *Phytophthora infestans* is inhibited by
   A. Low atmospheric pressure B. High atmospheric pressure
   C. Low temperature D. High temperature

10. Verticillium wilts are more common in
A. Potassium deficient soil B. Potassium rich soil
C. Nitrogen deficient soil D. Nitrogen rich soil
11. Fusarium wilt of cotton are more common in
A. Potassium deficient soil B. Potassium rich soil
C. Nitrogen deficient soil D. Nitrogen rich soil
12. The term 'inoculum potential' was coined by
A. Garrett B. Van der Plank
C. Horsfall D. Diamond and Horsfall
13. Peptidoglycan in cell wall is pesent in
A. Bacteria B. Archaea
C. Bacteria and archaea D. Fungi
14. Methionine is the amino acid initiating protein synthesis in
A. Bacteria B. Fungi
C. Bacteria and archaea D. Fungi and Archaea
15. Amino acid initiating protein synthesis in bacteria is
A. Formyl methionine B. Methionine
C. Serine D. Histidine
16. Histone proteins are absent in
A. Bacteria B. Archaea
C. Bacteria and Archaea D. Fungi
17. *Pantoea stewartia* p.v. *stewarti* survives in the intestinal tract of
A. *Hylemyo platura* B. *Acalymmavittatum*
C. *Chaetocnama pulicaira* D. *Anguina tritici*
18. *Erwinia tracheiphila* (causing cucmber wilt) lives in the intestine of
A. *Hylemyo platura* B. *Acalymma vittatum*
C. *Chaetocnama pulicaira* D. *Anguina tritici*
19. *Erwinia carotovora* subsp. *atroseptica* lives inside the body of
A. *Hylemyo platura* B. *Acalymma vittatum*
C. *Chaetocnama pulicaira* D. *Anguina tritici*
20. Which of the following is not a phloem colonizing bacteria
A. *Candidatus* Liberobacter B. *Serratia marcescens*
C. Clover club leaf agent D. *Clavibacterxyl*i subsp. *Xyli*
21. Plant diseases and disorders make the plant to-
A. suffer B. kill
C. reduce their ability to survive D. All of the above
22. The term pathology derived from how many greek words-
A. 1 B. 4
C. 3 D. 2

23. Pick the wrong one to the following statement Plant Pathology is to study the-
A. Diseases /disorders caused by biotic and abiotic agents
B. Mechanisms of plant development
C. The interaction between plant and the pathogen in relation to the overall environment
D. Development of suitable management strategy to surmount the diseases and to reduce the loss

24. The outbreak of "Irish Famine" during which year-
A. 1845 B. 1867
C. 1847 D. 1843

25. Coffee Wilt Disease caused by species –
A. *Fusarium oxysporum* *B.* *Fusarium Xylarioides*
C. *Fusarium avenaceum* *D.* *Fusarium acutatum*

26. 'Nova Plantarum genera' was published by whom-
A. Pier Antonio Micheli B. Matheiu Du Tillet
C. Tournefort D. Von martius and Morren

27. 'Nova Plantarum genera' was published in which year-
A. 1729 B. 1725
C. 1724 D. 1726

28. 'Benedict Prevost' discovered the life cycle of –
A. Rust fungus B. Bunt fungus
C. wheat stem rust D. None of the above

29. Bunt fungus was discovered by whom-
A. Anton De Bary B. Pier Antonio Micheli
C. Benedict Prevost D. None of the above

30. Father of Plant Pathology
A. Pier Antonio Micheli B. Anton De Bary
C. Benedict Prevost D. Julius Gotthelf Kuhn

31. Dark Era of Plant Pathology-
A. 18th Century B. 19th century
C. 17th century D. 20th century

32. Plant diseases includes losses by-
A. Droughts B. Nutrient deficiencies
C. Toxicities D. Parasitic microorganisms

33. Pathogenic microorganisms are-
A. Virus B. Bacteria
C. Nematodes D. All of the above

34. Plant Pathology does not try to increase our knowledge about-
A. Plant disease B. Weather
C. Equipments to control disease
D. Develop methods to manage disease

35. Infectious plants disease are –
A. Diseases caused by lack or excess of soil moisture
B. Disease caused by minerals toxicities
C. Disease cause by air pollution
D. Diseases caused by fungi

36. "*Systema Naturae"* published by-
A. Antonius Van Leeuwenhoek B. Carl Linnaeus
C. Charles Darwin D. Louis Pasteur

37. Crown Gall disease first showed by –
A. Koch B. Anton de Bary
C. Smith D. Alfred Fischer

38. The smallest infectious agents that can multiply autonomously in plant cell-
A. Viruses B. Bacteria
C. Prions D. Viroids

39. Role of Primary inoculum-
A. secondary infections B. no infection cased
C. Primary infections D. None of the above

40. The process through which genetic recombination can occur within fungal hrterokaryons-
A. Heterokaryosis B. Parasexualism
C. Vegetative incompatibility D. Heteroploidy

41. Partial or complete loss of virulence in pathogens-
A. Avirulence B. Attenuation
C. Mutation D. None of the above

42. Horizontal Resistance is governed by-
A. Single gene B. Multiple genes
C. Few genes D. None of the above

43. Race-specific and monogenic type of resistance-
A. Horizontal resistance B. Apparent resistance
C. Vertical resistance D. All of the above

44. The ability of plants to produce a good crop even when they are infected with pathogens-
A. Disease escape B. Tolerance to disease
C. Horizontal resistance D. Vertical resistance

45. What is the name of the special hyphal tips through which parasitic fungi absorb nutrients directly from the cytoplasm of the living host?
A. Haustoria B. Mildew
C. Constricting ring D. All of the above

46. What does 'Perfect stage' of a fungus indicate?
A. indicates that it can reproduce asexually
B. indicates that it is perfectly healthy
C. indicates that it is able to form perfect sexual spores
D. All of the above

47. Death angel/death cap (amanita) and Jack O Lantern mushroom are all examples of
A. Poisonous mushrooms B. Edible mushrooms
C. None of the above D. Both (a) and (b)

48. Oyster mushroom is an example of predator fungi that attacks
A. Tapeworms B. Pinworms
C. Platyhelminthes D. Roundworms

49. Columella is a specialized sterile structure found in sporangium of-
A. Ulothrix B. Yeast
C. Spirogyra D. Rhizopus

50. When hyphae of a mycelium grow together and intertwine with one another forming a thick woven tissue, it is called as?
A. Plectenchyma B. Sclerotia
C. Rhizomorph D. All of the above

51. Which of the following is edible fungi?
A. Morchella B. Agaricus
C. Lycoperdon D. All of the above

52. When two mycelia of opposite strains (+) & (-) come near one another, the mycelia produce small outgrowths called as:
A. Progametangia B. Sclerotia
C. Ascus D. Metulae

53. Which of the following is homothallic?
A. Rhizopus nigricans *B. Rhizopus stolonifer*
C. Rhizopus sexualis D. Both A and B

54. Chief enzyme found in yeast cell is:
A. Amylase B. Maltase
C. Zymase D. Ligase

55. What is the name of the chemical present in the lichens that have great medicinal value against various ailments?
A. Lichenin B. Stringent chemicals
C. Usnic acid D. Both A & B

56. An association in which only one of the partners benefits and there is no disadvantage to the other partner is known as:
A. Mutualism B. Commensalism
C. Symbiosis D. Parasitism

57. The AM fungi belongs to phylum
A. Glomeromycota B. Ascomycota
C. Basidiomycota D. None of the above

58. The reserve food in yeast is the form of:
A. Starch B. Cellulose
C. Oils & glycogen D. Protein

59. Yeast belongs to class:
A. Deuteromycetes B. Basidiomycetes
C. Zygomycetes D. Ascomycetes

60. Which Penicillium species used in 'Cheese' making?
A. *Penicillium notatunt* B. *Penicillium roqueforti*
C. *Penicillium diuaricatum* D. *Penicillium crysogemum*

61. Organisms that derive their nutrition from dead organic matter are referred as-
A. Hemibiotroph B. Autotrophs
C. Saprophytes D. None of the above

62. The ability of an otherwise susceptible plant to avoid damaging disease stress because the way it grows is referred as-
A. Disease escape B. Tolerance
C. HR response D. Vertical resistance

63. The time lapsing between inoculation and appearance of symptoms is known as-
A. Incubation period B. Latent period
C. Dormant period D. Acquired time period

64. Disease prevalent in, and confined to a particular area, country or district are referred as-
A. Pandemic B. Endemic
C. Epidemic D. Sporadic

65. Resistance when it is evenly spread against all races or a pathogen is known as
A. Horizontal Resistance B. Vertical Resistance
C. Oligogenic Resistance D. None of the above

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CHAPTER 2
INTRODUCTION AND PRINCIPLE OF PLANT PATHOLOGY

1. Ans: A, Source: HC Dube, Modern Plant Pathology, Page- 34
2. Ans: B, Source: HC Dube, Modern Plant Pathology, Page- 35
3. Ans: B, Source: HC Dube, Modern Plant Pathology, Page- 35
4. Ans: D, Source: HC Dube, Modern Plant Pathology, Page- 36
5. Ans: A, Source: HC Dube, Modern Plant Pathology, Page- 37
6. Ans: C, Source: RS Singh, Introduction to principles of Plant Pathology, Page- 10
7. Ans: D, Source: RS Singh, Introduction to principles of Plant Pathology, age- 12
8. Ans: A, GN Agrios, Plant Pathology, Page- 16
9. Ans: A, Source: HC Dube, Modern Plant Pathology, Page- 34
10. Ans: B, Source: HC Dube, Modern Plant Pathology, Page- 36
11. Ans: A, Source: HC Dube, Modern Plant Pathology, Page- 36
12. Ans: C, Source: Modern Plant Pathology, Page- 36
13. Ans: A, Source: KK Mondal, Plant bacteriology, Page- 2
14. Ans: D, Source: KK Mondal, Plant bacteriology, Page- 2
15. Ans: A, Source: KK Mondal, Plant bacteriology, Page- 2
16. Ans: A, Source: KK Mondal, Plant bacteriology, Page- 2
17. Ans: C, Source: HC Dube, Modern Plant Pathology, Page- 55
18. Ans: B, Source: HC Dube, Modern Plant Pathology, Page- 55
19. Ans: A, Source: HC Dube, Modern Plant Pathology, Page- 55
20. Ans: D, Source: HC Dube, Modern Plant Pathology, Page- 70
21. Ans: (D) All the above, Source: D Alice, C Jeyalakhmi, AS Krishnamoorthy, M Karthikeyan, Fundamentals of Phytopathology, Page- 1
22. Ans: (D) 2, Source: D Alice, C Jeyalakhmi, AS Krishnamoorthy, M Karthikeyan, Fundamentals of Phytopathology, Page- 1
23. Ans: (B) Mechanism of Plant Development, Source: D Alice, C Jeyalakhmi, AS Krishnamoorthy, M Karthikeyan, Fundamentals of Phytopathology, Page- 1
24. Ans: (A) 1845, Source: D Alice, C Jeyalakhmi, AS Krishnamoorthy, M Karthikeyan, Fundamentals of Phytopathology, Page- 2
25. Ans: (B) *Fusarium Xylariodes*, Source: D Alice, C Jeyalakhmi, AS Krishnamoorthy, M Karthikeyan, Fundamentals of Phytopathology, Page-3
26. Ans: (A) Pier Antonio Micheli, Source: D Alice, C Jeyalakhmi, AS Krishnamoorthy, M Karthikeyan, Fundamentals of Phytopathology, Page- 6

27. Ans: (A) 1729, Source: D Alice, C Jeyalakhmi, AS Krishnamoorthy, M Karthikeyan, Fundamentals of Phytopathology, Page- 6
28. Ans: (B) Bunt fungus, Source: D Alice, C Jeyalakhmi, AS Krishnamoorthy, M Karthikeyan, Fundamentals of Phytopathology, Page-6
29. Ans: (C) Benedict Prevost, Source: D Alice, C Jeyalakhmi, AS Krishnamoorthy, M Karthikeyan, Fundamentals of Phytopathology, Page- 6
30. Ans: (B) Anton de Bary, Source: D Alice, C Jeyalakhmi, AS Krishnamoorthy, M Karthikeyan, Fundamentals of Phytopathology, Page- 7
31. Ans: (C) 17th century, Source: D Alice, C Jeyalakhmi, AS Krishnamoorthy, M Karthikeyan, Fundamentals of Phytopathology, Page- 5
32. Ans: (D) Parasitic microorganisms, Source: GN Agrios, Plant Pathology, Page- 4
33. Ans: (D) All of the above, Source: GN Agrios, Plant Pathology, Page- 7
34. Ans: (B)Weather, Source: GN Agrios, Plant Pathology, Page- 5
35. Ans: (D), Diseases caused by fungi, Source: GN Agrios, Plant Pathology, Page- 8
36. Ans: (B) Carl Von Linne, Source: GN Agrios, Plant Pathology, Page- 17
37. Ans: (C) Smith, Source: GN Agrios, Plant Pathology, Page- 24
38. Ans: (D) Viriods, Source: GN Agrios, Plant Pathology, Page- 27
39. Ans: (C) Primary infections, Source: GN Agrios, Plant Pathology, Page- 80
40. Ans: (B) Parasexuality, Source: GN Agrios, Plant Pathology, Page- 132
41. Ans: (B) Attenuation, Source: GN Agrios, Plant Pathology, Page- 133
42. Ans: (B) Multiple genes, Source: GN Agrios, Plant Pathology, Page- 136
43. Ans: (C)Verticle resistance, Source: GN Agrios, Plant Pathology, Page- 136
44. Ans: (B)Tolerance to disease, Source: GN Agrios, Plant Pathology, Page- 139
45. Ans: (A) Haustoria, Source: GN Agrios, Plant Pathology, Page- 14
46. Ans: (C) indicates that it is able to form perfect sexual spores, Source: GN Agrios, Plant Pathology, Page- 439
47. Ans: (A) Poisonous mushrooms
48. Ans: (D) Roundworms
49. Ans: (D) Rhizopus, Source: GN Agrios, Plant Pathology, Page- 14
50. Ans: (A) Plectenchyma
51. Ans: (D) All of the above
52. Ans: (A) Progametangia, Source: GN Agrios, Plant Pathology, Page- 436
53. Ans: (C) *Rhizopus sexualis*, Source: GN Agrios, Plant Pathology, Page- 435
54. Ans: (C) Zymase, Source: GN Agrios, Plant Pathology, Page- 162
55. Ans: (D) Both A & B, Source: HC Dube, An introduction to fungi, Page- 481
56. Ans: (B) Commensalism, Source: HC Dube, An introduction to fungi, Page- 455
57. Ans: (B) Ascomycota, Source: HC Dube, An introduction to fungi, Page- 465
58. Ans: (B) Oils & glycogen, Source: GN Agrios, Plant Pathology, Page- 162
59. Ans: (D) Ascomycetes
60. Ans: (B) *Penicillium roqueforti,* Source: RS Singh, Introduction to principles of Plant Pathology, Page- 3

61. Ans: (C) Saprophytes, Source: RS Singh, Introduction to principles of Plant Pathology, Page- 10
62. Ans: (A) Disease escape, Source: RS Singh, Introduction to principles of Plant Pathology, Page- 11
63. Ans: (A) Incubation period, Source: RS Singh, Introduction to principles of Plant Pathology, Page- 12
64. Ans: (A) Endemic, Source: RS Singh, Introduction to principles of Plant Pathology, Page- 39
65. Ans: (A) Horizontal Resistance, Source: RS Singh, Introduction to principles of Plant Pathology, Page- 11

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CHAPTER 3
PLANT MICROBE INTERACTION

1. Pathogenicity factors and genes used by *Magnaporthe oryzae* for plant infection have given below. Choose the wrong pair.

i)	mpg1 (Hydrophobin)	-	Appressoria formation
ii)	pth 11	-	Initiation of infection peg
iii)	Glycerol	-	Turgor pressure for direct penetration
iv)	PMK 1	-	Increases virulence
v)	G- protein genes	-	Conidia Production

A. i, ii, iv B. ii, iv, v
C. ii, iii, v D. i, iv, v

2. Effector proteins that function as cysteine protease inhibitors were first discovered in…..

i) *Fassalora flora* – Avr 1 *ii)* *Cladosporium fulvum* – Avr 1
iii) *Cladosporium fulvum* – Avr 2 *iv)* *Passalora fulva* – Avr 2
v) *Cladosporium fulva* – Avr 3

A. iii and iv B. i and ii
C. iv and v D. only v

3. Fungal pathogenicity signaling genes are…..

i) Chitin elicitor receptor kinase genes
ii) G- protein coding genes
iii) cAMP dependent protein kinase genes
iv) Elongation factor receptor kinase genes
v) Mitogen activated protein kinase genes

A. i, iii, iv B. i, ii, v
C. ii, iii, iv D. ii, iii, v

4. Triple gene block (TGB) mediates the cell to cell movement virus was not noticed in…..

A. Hibiscus green spot virus B. Tobacco rattle virus
C. Potato virus X D. Lettuce necrotic yellow virus

5. Which of the following statement is correct about EPS 1 of the *Ralstonia solanacearum* causing bacterial wilt of solanaceous plants?

i) EPS 1 is the virulence factor of the disease
ii) EPS 1 is a pathogenicity factor of the disease
iii) EPS 1 is a polymer composed of trimeric repeating unit

iv) EPS component of fire blight bacterium is amylovoran
v) EPS 1 causes wilting by occluding the xylem vessels and rupturing of cells due to high osmotic pressure

A. i, ii, v B. i, ii, iv, v
C. i, iii, iv, v D. ii, iii, v

6. A new class of R gene which acts against majority of the plant viruses…..
A. NBS-LRR B. eIF4E/4G
C. eIF4K/Z D. eIF4F/4H

7. Virulent determinants of *Erwinia amylovora* is…..
A. Lipopolysaccharide B. Amylovoran
C. Pectin methyl esterase and glucanase
D. Catechol and hydroxamate siderophores

8. Resistant genes identified for Fusarium wilt TR-4 infecting bananas…..
A. *RGA2 & Ced9* B. *RPS1 & Ced 9c*
C. *RPW8 & Ced9* D. *RGA1& RGA2*

9. PWL (pathogenicity on weeping lovegrass), a small gene family identified in …..
A. *Magnaporthe grisea* B. *Phytophthora infestans*
C. *Ralstonia solanacearum* D. *Fusarium oxysporum*

10. Which is true statement about the *Ustilagomaydis* pathogen?
i) A tetrapolar mating system is essential for pathogenicity of the fungus.
ii) Haploid sporidia of the fungus can grow as saprophytes in soil and non-pathogenic on plants.
iii) The mating loci a1b1 will mate with a2b20 but not with a2b1 or a1b20.
iv) 'a' locus encodes lipopeptide pheromone (Mf) and pheromone receptor (Pr).
v) 'b' locus has two open reading frames bW and bE.

A. i , iii , v B. i , ii , iv
C. ii, iii, v D. All of the above

11. *Botrytis cinerea* a necrotrophic fungus penetrates the leaf tissue by ……
A. Physical pressure alone
B. Melanin present in germlings of the pathogen helps in appressoria formation
C. Membrane associated protein BcPLS 1
D. The action of cutinase and lipase enzymes

12. Occurrence of cell death during hypersensitive response is due to……
A. Caspase activity B. Proteolytic activity
C. Cellulase activity D. Lipase activity

13. The stability and proper folding of R genes during activation of defense in plants requires……
A. ABC proteins B. Non-structural proteins
C. Chaperone protein complex D. Aromatic amino acids

14. Tentoxin is a ……

A. Cyclic tetrapeptide B. Cyclic pentapeptide
C. Tetrapeptide D. Arginine tripeptide

15. Which of the following produces a detoxification enzyme gene which doesn't follow gene for gene concept?

A. Magnaporthe oryzae *B. Alternaria alternata*
C. Phytophthora infestans *D. Cochliobolus heterostrophus*

16. 'Suppressors' proteins produced by *Mycosphorella* acts upon…… which suppresses the host defence action.

A. Neutralizing hydrogen peroxide
B. Proton pumping activity
C. Suppression of phenyl alanine ammonia lyase activity
D. Reducing the phytoalexin production

17. The first avirulence gene identified was the protein of ……gene from *P. syringae* p.v. *glycinea* which involve in synthesis of syringolides.

A. avr B B. avr A
C. avr D D. avr C

18. Match the correct R gene classes with their examples.

i) Class I – pto ii) Class II – pi-ta
iii) Class III – Xa21 iv) Class IV – cf2, cf9
v) Class V – RPW8

A. i, iii, v B. i, ii, iii
C. ii, iv, v D. All

19. Receptor elicitor-complex is formed at plasma membrane in which of the following?

A. Fungi B. Bacteria
C. Virus D. Phytoplasma

20. Which of the following is the final stage of rapid defense response?

A. Instant loss of membrane permeability
B. Fortification of the cell wall
C. Hypersensitive response
D. Phytoalexin production around dead cell

21. What is the time taken for accumulation of phytoalexin?

A. Minutes B. Seconds
C. Hours D. None

22. Which of the following phytoalexin is produced by potato tuber?

A. Rishitin B. Lubimin
C. Solavetivone D. All the above

23. How many families of PRPs have been officially recognized by Van Loon *et al*., 2006?

A. 12 B. 13
C. 17 D. 15

24. Salicylic acid biosynthesis in plants takes place by which pathway?
A. Isochorismate synthase B. Phenyl propanoid pathway
C. Both A and B D. None of the above
25. Which of the following acts as signaling molecule for ISR (induced systemic resistance)?
A. Salicylic acid B. Jasmonic acid
C. Ethylene D. Both B and C
26. The two pathways of SAR and ISR depend on which regulatory protein?
A. NPR1 B. NPS1
C. PRPs D. None of the above
27. Which of the following defense compounds are produced due to expression of *PDF1.2* gene during SAR?
A. Plant defensins B. Thionins
C. Both A and B D. None of the above
28. Which of the following defense compounds are produced due to expression of *Thi2.1* gene during SAR?
A. Plant defensins B. Thionins
C. Both A and B D. None of the above
29. Which of the following acts as signaling molecule for the production of PIN proteins?
A. Salicylic acid B. Jasmonic acid
C. Ethylene D. Both B and C
30. What is the last step in pin-gene expression?
A. JA production B. Ethylene production
C. SA production D. None of the above
31. Which of the following are defense compounds in plants?
A. PRPs B. Plant defensins and Thionins
C. Thionins D. All the above
32. Who gave the gene for gene hypothesis to explain the specificity of interactions in flax/rust?
A. Flor (1955) B. Biffen's (1905)
C. Van Loon (1997) D. None
33. Non-specific resistance involves which of the following genes?
A. Pathogenicity genes B. Defense genes
C. Both A and B D. None
34. Among the following class of R protein which constitute the largest class?
A. *Cfx* B. *NBS-LRRs*
C. *PWR8* D. *Pto*
35. Which of the following is the first R gene located, isolated and sequenced from maize?
A. *Hm1* B. *Pto*
C. C*f5* D. C*f4*

36. Tabtoxin is produced by which organism?
A. *Pseudomonas syringae* p.v. *tabaci*
B. *Cochliobolus victoriae*
C. *C. carbonum* D. *C. heterosporus*

37. HC toxin is produced by which organism?
A. *Cochliobolus carbonum* B. *Cochliobolus victoriae*
C. *Cochliobolus heterosporus*
D. *Pseudomonas syringae* p.v. *tabaci*

38. T-toxin is produced by which organism?
A. *Cochliobolus heterostrophus* B. *Cochliobolus carbonum*
C. *Cochliobolus victoriae* D. None

39. Many plant R proteins might be activated indirectly by pathogen-encoded effectors, and not by direct recognition. This hypothesis is called…..
A. Gene for gene B. Guard model
C. Decoy model D. None of the above

40. NB-LRR-mediated disease resistance is effective against
A. Biotrophs B. Hemi-biotrophs
C. Necrotrophs D. Both A and B

41. State whether true or false; ETI is an accelerated and amplified PTI response, resulting in disease resistance and, usually, a hypersensitive cell death response (HR) at the infection site
A. True
B. False

42. Some *P syringae* strains make coronatine, a jasmonic acid mimic that…..
A. Suppresses JA mediated defence and induce stomatal opening
B. Suppresses SA mediated defence and induce stomatal opening
C. Suppresses JA mediated defence and induce stomatal closing
D. Suppresses SA mediated defence and induce stomatal closing

43. PTI involves repression of auxin responses, mediated in part by a micro-RNA that is also induced during…..
A. Abscisic-acid-mediated stress responses
B. Gibberellic-acid-mediated stress responses
C. Jasmonic-acid-mediated stress responses
D. Salicylic-acid-mediated stress responses

44. Biotypes of pathogens that vary in their pattern of compatible or incompatible reactions on a set of host plant cultivars are referred to as…..
A. Pathovar B. Cultivar
C. Race D. None of the above

45. A virulence genes lead directly or indirectly to agents, called _____, that initiate the HR in incompatible plants
A. Effectors B. Elicitors
C. Phytoalexins D. PAMPs

46. The first microbial avirulence gene was cloned from
A. Race 6 of *Pseudomonas syringae* p.v. *pisi*
B. Race 2 of *Pseudomonas syringae* p.v. *pisi*
C. Race 6 of *Pseudomonas syringae* p.v. *glycinea*
D. Race 2 of *Pseudomonas syringae* p.v. *glycinea*

47. The first microbial avirulence gene was cloned by…..
A. Jones B. Stackman
C. Walker D. Staskawicz

48. The first microbial avirulence gene, avrA encode a single protein product of…..
A. 100kd B. 200kd
C. 300kd D. 400kd

49. The elicitor-receptor model is given by…..
A. Brown and Harvey B. Gabriel and Rolfe
C. Bawden and Piere D. Black and Brakke

50. State whether true or false-" Resistance to rust in linseed is inherited as a dominant character although in some genes the dominance is incomplete"
A. True B. False

51. The multicellular host and its associated microbiota as a functional entity is called…..
A. Holobiont B. Heterobiont
C. Microbiont D. None of the above

52. Gram-negative bacteria to monitor their own population densities through the production of the signaling molecule…..
A. Dihydroacetone B. PHB
C. N-acyl-l-homoserine lactone (AHL)
D. Erthritol

53. Plant-associated bacteria can engage in direct antagonistic interactions mediated by contact-dependent killing mechanisms via…..
A. Type I secretion system B. Type II secretion system
C. Type III secretion system D. Type IV secretion system

54. Specific bacteria can use hyphae of filamentous eukaryotes as a vector, is called…..
A. Bacterial highway B. Fungal highway
C. Bacterial-fungal highway D. None of the above

55. Degree of synchronization is highest in…..
A. Necrotrophs B. Semi-biotrophs
C. Biotrophs D. Symbionts

56. Protein for protein hypothesis was proposed by…..

A. H.H.Flor B. Vander Plank

C. Sequeira D. Clarke and Knox

57. Which genes code for synthesis of substances involved in the host parasite interaction?

A. Producer genes B. Receptor genes

C. Senor genes D. Integrator

58. Which genes bind agents that induce a specific pattern of activity in the genome?

A. Producer genes B. Receptor genes

C. Sensor genes D. Integrator

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CHAPTER 14
PLANT MICROBE INTERACTION

1. (**Ans: B (ii, iv, v)**, Source: G. N. Agrios, Plant Pathology, Page No. 144,146.)
2. (**Ans: A (iii and iv)**, Source: *Ustilagomaydis* effectors and its impact on virulence, Lanver *et al*. (2017), Nature reviews, Page No. 413.
3. (**Ans: D (ii, iii, v)**, Source: G. N. Agrios, Plant Pathology, Page No. 146.)
4. (**Ans: C (Potato virus X)**, Recent advances in research of plant virus movement mediated by triple gene block, Solovyev *et al*. (2012) Mini Review, *Frontiers in plant science*.)
5. (**Ans: C (i, iii, iv, v)**, Source: G. N. Agrios. Plant Pathology, Page No. 148.)
6. (**Ans: B (eIF4E/4G)**, Eukayotic translation initiation factors shape RNA viruses resistance in plants, Shopan *et al*. (2020), *Horticultural plant journal.*)
7. (**Ans: D (Catechol and hydroxamate siderophores)**, Source: G.N. Agrios. Plant Pathology, Page No. 149.)
8. (Ans: **A (RGA2 & Ced9)**, Source: Transgenic Cavendish banana with resistance to Fusarium wilt tropical race 4 by Dale *et al*. (2017), *Nature communications.*)
9. (**Ans: A (*Magnaporthe grisea*)**, Source: Molecular plant pathology by Dickinson. Page No. 77.)
10. (**Ans: D (All of the above)**, Source: Molecular plant pathology by Dickinson. Page No. 81.)
11. (**Ans: C (Membrane associated protein BcPLS 1)**, Source: Licensed to kill: The lifestyle of a necrotrophic plant pathogen Review, Jan. A. L. VanKan (2006). Trends in plant science)
12. (**Ans: A (Caspase activity)**, Source: Immune receptors and co-receptors in antiviral innate immunity in plants. Gouveia *et al*. (2016). Frontiers in microbiology.)
13. (**Ans: C (Chaperone protein complex)**, Source: Immune receptors and co-receptors in antiviral innate immunity in plants. Gouveia *et al*. (2016). Frontiers in microbiology.)
14. (**Ans: A (Cyclic tetrapeptide)**, Source: Plant pathology, G. N. Agrios. Page No. 191.)

15. (**Ans: D (*Cochliobolus heterostrophus*)**, Source: Plant pathology, G. N. Agrios. Page No. 224.)
16. (**Ans: B (Proton pumping activity)**, Source: Plant pathology, G. N. Agrios. Page No. 203.)
17. (**Ans: C (avr D)**, Source: Plant pathology, G. N. Agrios. Page No. 223.)
18. (**Ans: A (i, iii, v)**, Source: Plant pathology, G. N. Agrios. Page No. 224.)
19. (**Ans: A (Fungi)**, Source: HC Dube: Modern Plant Pathology, page: 202)
20. (**Ans: C (Hypersensitive response)**, Source: HC Dube: Modern Plant Pathology, page: 204)
21. **(Ans: C (Hours)**, Source: HC Dube: Modern Plant Pathology, page: 205)
22. (**Ans: D (All the above)**, Source: HC Dube: Modern Plant Pathology, page: 206)
23. (**Ans: C (17)**, Source: HC Dube: Modern Plant Pathology, page: 208)
24. (**Ans: C (Both A and B)**, Source: HC Dube: Modern Plant Pathology, page: 211)
25. (**Ans: D (Both B and C)**, Source: HC Dube: Modern Plant Pathology, page: 212)
26. (**Ans: A (NPR1)**, Source: HC Dube: Modern Plant Pathology, page: 212)
27. **(Ans: A (Plant defensins)**, Source: HC Dube: Modern Plant Pathology, page: 213)
28. **(Ans: B (Thionins)**, Source: HC Dube: Modern Plant Pathology, page: 213)
29. **(Ans: D (Both B and C)**, Source: HC Dube: Modern Plant Pathology, page: 214)
30. **(Ans: A (JA production)**, Source: HC Dube: Modern Plant Pathology, page: 215)
31. **(Ans: D (All the above)**, Source: HC Dube: Modern Plant Pathology, page: 216)
32. **(Ans: A (Flor (1955))**, Source: HC Dube: Modern Plant Pathology, page: 222)
33. **(Ans: C (Both A and B)**, Source: HC Dube: Modern Plant Pathology, page: 226)
34. **(Ans: B (*NBS-LRRs*)**, Source: HC Dube: Modern Plant Pathology, page: 226)
35. **(Ans: A (*Hm1*)**, Source: G. N. Agrios: Plant Pathology, page: 156)
36. **(Ans: A (*Pseudomonas syringae* p.v. *tabaci*)**, Source: G. N. Agrios: Plant Pathology, page: 191)
37. **(Ans: A (*Cochliobolus carbonum*)**, Source: G. N. Agrios: Plant Pathology, page: 194)
38. **(Ans: A (*Cochliobolus heterosporus*)**, Source: G. N. Agrios: Plant Pathology, page: 194)
39. (**Ans: B (Guard model)**, Source: 'The plant immune system' by Jones and Dangl)
40. (**Ans: D (Both A and B)**, Source: 'The plant immune system' by Jones and Dangl)
41. (**Ans: A (True)**, Source: 'The plant immune system' by Jones and Dangl)

42. (**Ans: B (Suppresses SA mediated defence and induce stomatal opening)**, Source: 'The plant immune system' by Jones and Dangl)
43. (**Ans: A (Abscisic-acid-mediated stress responses)**, Source: 'The plant immune system' by Jones and Dangl)
44. (**Ans: C (Race)**, Source: 'Gene for gene complementarity in plant pathogen interactions' by Keen, page 448)
45. (**Ans: B (Elicitors)**, Source: 'Gene for gene complementarity in plant pathogen interactions' by Keen, page 449)
46. (**Ans: C (Race 6 of *Pseudomonas syringae* p.v. *glycinea*)**, Source: 'Gene for gene complementarity in plant pathogen interactions' by Keen, page 450)
47. (**Ans: D (Staskawicz)**, Source: 'Gene for gene complementarity in plant pathogen interactions' by Keen, page 450)
48. (**Ans: A (100kd)**, Source: 'Gene for gene complementarity in plant pathogen interactions' by Keen, page 450)
49. (**Ans: B (Gabriel and Rolfe)**, Source: 'Gene for gene complementarity in plant pathogen interactions' by Keen, page 451)
50. (**Ans: A (True)**, Source: RS Singh, Introduction to principles of Plant Pathology, Page- 212)
51. (**Ans: A (Holobiont)**, Source: 'Microbial interactions within the plant holobiont' by Hassani *et al.,* 2018, page 1)
52. (**Ans: C (N-acyl-l-homoserine lactone (AHL))**, Source: 'Microbial interactions within the plant holobiont' by Hassani *et al.,* 2018, page 5)
53. (**Ans: D (Type IV secretion system)**, Source: 'Microbial interactions within the plant holobiont' by Hassani *et al.,* 2018, page 6)
54. (**Ans: B (Fungal highway)**, Source: 'Microbial interactions within the plant holobiont' by Hassani *et al.,* 2018, page 5)
55. (**Ans: D (Symbionts)**, Source: RS Singh, Introduction to principles of Plant Pathology, Page- 211)
56. (**Ans: B (Vander Plank)**, Source: RS Singh, Introduction to principles of Plant Pathology, Page- 228)
57. (**Ans: A (Producer gene)**, Source: RS Singh, Introduction to principles of Plant Pathology, Page- 226)
58. (**Ans: C (Sensor genes)**, Source: RS Singh, Introduction to principles of Plant Pathology, Page- 226) -0-

CHAPTER 4
FUNDAMENTALS OF MYCOLOGY

1. The roman emperor Cladius Caesar was murdered by his wife in 54 A.D by mixing a decoction of the mushroom
   A. *Amanita phalloides* *B.* *Aspergillus flavus*
   C. *Aspergillus nidulans* *D.* *Agaricusbisporus*
2. Who made an extensive study of fungi and discovered that spores were the reproductive structures of fungi?
   A. Anton de Bary B. Antonio Micheli
   C. Louis Pasteur D. Pontecorvo and Roper
3. Late blight of potato occurred in which year and in which country
   A. 1842, Ireland B. 1823, Switzerland
   C. 1845, Ireland D. 1850, Ireland
4. Penicillin was discovered by which of the following scientist
   A. Alexander Fleming,1928 B. Louis pastuer,1920
   C. Robert Koch ,1912 D. Antonio Micheli, 1729
5. Which of the following is known as Baker's and Brewer's yeast?
   A. *Saccharomyces paradoxus* *B.* *Saccharomyces uvarum*
   C. *Saccharomyces cerevisiae* *D.* *Aspergillus nidulans*
6. Which of the following are known as Obligate parasites?
   A. Rust B. Powdery mildew and downy mildew
   C. Both A and B D. None
7. The mode of nutrition in fungi is
   A. Heterotrophic and non-absorptive B. Autotrophic and absorptive
   C. Heterotrophic and absorptive D. Ingestion type
8. The cell wall of fungi is made up of which of the following
   A. Polysaccharides B. Nucleo-proteins
   C. Chitin and cellulose D. All of the above
9. One of the important characteristics of basidiomycetes fungi is
   A. Karyochoresis B. Dolipore septum
   C. Both A and B D. None
10. The unseptate hyphae have the nuclei scattered in the cytoplasm. This condition is known as
    A. Holocytic condition B. Coenocytic condition
    C. Non coenocytic condition D. None of the above

11. Chitin is a polymer of which of the following
    A. Polysaccharides B. Polymer of N- acetyl glucosamine units
    C. Beta glucose units D. All of the above
12. The condition in which two nuclei of opposite strains remain as paired but does not fuse with each other is known as
    A. Homokaryon B. Dikaryon
    C. Anamorphic D. Telomorphic
13. Plasmogamy is
    A. Fusion between 2 asexual cells B. Fusion between 2 sexual cells
    C. Fusion between similar cells D. Fusion between 2 dissimilar cells
14. Karyogamy is fusion between
    A. 2 nuclei B. 2 cells
    C. 2 vegetative cells D. None of the above
15. Fusion between gametangia is called
    A. Plasmogamy B. Karyogamy
    C. Gametangiogamy D. None of the above
16. Fusion between 2 similar gametangia results in a zygote, which is called
    A. Zygospore B. Oospore
    C. Zoospore D. None of the above
17. Zygote formed by the fusion between morphologically distinct gametangia is called as
    A. Zygospore B. Oospore
    C. Zoospore D. None of the above
18. Coprophilous fungi grow on which of the following
    A. Lignin B. Dung
    C. Paper D. Grass
19. Founder of modern Mycology and the father of plant pathology is
    A. Louis Pasteur B. de Bary
    C. Antonio Micheli D. E.J Butler
20. Germ theory was given by
    A. Louis Pasteur B. Robert Koch
    C. Anton van leeuwenhoek D. De Bary
21. *Olpidium brassicae* is the vector of virus
    A. Lettuce big vein virus (LBVV) B. Tobacco necrosis virus (TNV)
    C. Tobacco stunt virus (TSV) D. All of the above
22. The phenomenon of heterothallism was discovered in Mucor in 1904 by which of the following scientist
    A. Louis Pasteur B. A.F Blakeslee
    C. Anton van leeuwenhoek D. De Bary

23. Fumaric acid is produced by
A. Rhizopus B. Mucor
C. Aspergillus D. Fusarium
24. The ascogonia are usually globular and bear hair like outgrowth called as
A. Crook cell B. Trichogyne
C. Atrichogyne D. None of the above
25. In dikaryotic cell of the ascogenous hyphae elongates and bends to form a hook or crozier – like cell known as
A. Crook cell B. Trichogyne
C. Atrichogyne D. None of the above
26. The entire body of the fungus is called
A. Plasmodium B. Thallus
C. Rhizobium D. None of the above
27. The ribosomes of all fungi are
A. 80S B. 70S
C. 85S D. 90S
28. Which of the following is known as "Kerosene fungus'?
A. *Scopulariopsis* spp *B.* *Aspergillus* spp.
C. *Amorphotheca resinae* *D.* *Penicillium* spp.
29. The disease caused by Aflatoxins
A. Hepatitis B. Cardiac beri-beri in man
C. Paspalum staggers D. Aflatoxicoses
30. The disease caused by Citreovirdin
A. Hepatitis B. Cardiac beri-beri in man
C. Paspalum staggers D. Aflatoxicoses
31. Aflatoxins are produced by
A. *Penicillium oxalicum* *B.* *Aspergillus niger*
C. *Aspergillus flavus* D. None of the above
32. Agaru perfume is obtained by modulating wood of the tree *Aguilaria agallocha* with the fungus
A. *Fistulina hepatica* *B.* *Epicoccum granulatum*
C. *Serpula lacrymans* *D.* *Chaetomium globosum*
33. Parasexual cycle discovered by Pontecarvo and Roper in 1952 in the fungus
A. *Aspergillus niger* *B.* *Aspergillus nidulans*
C. *Aspergillus flavus* D. None of the above
34. Foot rot of cereals is caused by
A. *Cochliobolus miyabeanus* *B.* *Cochliobolus heterostrophus*
C. *Cochliobolus sativus* *D.* *Cochliobolus victoriae*
35. The term "smut" in German language means
A. Dirty B. Ugly

C. Unattractive D. None of the above

36. ——————————— and ——————————— are absent in smut fungi.
A. Parenthesomes B. Clamp connection
C. Both (A) and (B) D. None of the above

37. The smut fungi have a uniform life cycle comprising
A. A saprobic, yeast-like haplophase
B. A parasitic dikaryophase
C. Diploid phase D. All of the above

38. *Entorrhizomycetes* is represented by order
A. Entorrhizales *B. Ustilaginales*
C. Urocystidales *D. Tilletiales*

39. The promycelium, which bears the basidiospores can be called as
A. Hypobasidium B. Probasidium
C. Epibasidium D. None of the above

40. The process of plasmogamy in fungi is referred as
A. Diploidization B. Dikaryotization
C. Gonotoconts D. Syncaryon

41. The shape of oogonium is
A. Round B. Elongated
C. Globose D. Square

42. The blast disease of rice is caused by
A. Magnaporthe grisea *B. Helminthosporium oryzae*
C. Giberella fujikuroi *D. Xanthomonas oryzae*

43. Which of the following rice disease is known "**Rice fever disease**"?
A. Bacterial leaf blight B. Blast disease
C. Brown leaf spot D. Bakane disease

44. Rust of pea is caused by
A. Uromyces appendiculatus *B. Uromyces fabae*
C. Uromyces ciceris
D. Gymnosporangium juniper-virginianae

45. Cedar-Apple rust is caused by
A. Uromyces appendiculatus *B. Uromyces fabae*
C. Uromyces ciceris
D. Gymnosporangium juniper-virginianae

46. Small hair like growth called mastigonemes is found in?
A. Tinsel typer flagella B. whiplash type flagella
C. Both a and b D. Not found in flagella

47. Example of systemic fungicide?

A. Mancozeb B. Carbendazim
C. Copper oxychloride D. Dinocap

48. A special spores in which karyogamy and meiosis occurs called?

A. Teliospore B. Aeciospores
C. Uredospore D. Basidiospore

49. In Basidiomycota, club shaped structure bearing basidiospore on pointed projection called

A. Basidium B. Sterigmata
C. Parenthesome D. Promycelium

50. In Black stem rust of wheat, which spore is called repeating spore?

A. Teliospore B. Aeciospores
C. Uredospore D. Basidiospore

51. The anthracnose fungus belongs to genus?

A. Aspergillus *B. Colletotrichum*
C. Fusarium *D. Alternaria*

52. The conidia of genus which have both transverse as well as longitudinal septa?

A) *Aspergillus* B) *Colletotrichum*
C) *Fusarium* D) *Alternaria*

53. Dry Spores is formed in which genus?

A) *Rhizopus* B) *Mucor*
C) *Pilobolus* D) None of the above

54. In oomycetes the life cycle is?

A) Haploid B) Haploid- Diploid
C) Diploid D) Asexual

55. Type of ascocarp where hymenium layer is absent?

A) Perithecium B) Cleistothecium
C) Apothecium D) None of the above

56. Shot –gun fungus is referred to which genus of fungus?

A) *Rhizopus* B) *Mucor*
C) *Pilobolus* D) None of the above

57. Fungus known as death cap?

A) *Conocybe filaris* B) *Amanita phalloides*
C) *Galerina marginata* D) *Cortinarius species*

58. Scientific name of "Button Mushroom"?

A. Agaricus bisporus *B. Agaricus campestris*
C. Agaricus arvensis *D. Agaricus augustus*

59. In case of rust, no. of basidiospore on germination of teliospore are?

A) 2 B) 4
C) 8 D None of the above

60. In ascus formation, no. of nuclei in final division?

A) 2 B) 4
C) 8 D 16

61. 75% of all fungi belong to which pylum?

A. Basidiomycota B. Deuteromycota
C. Mastigomycota D. Ascomycota

62. Brown rust of wheat is caused by?

A. Puccinia recondita *B. Puccinia graminis tritici*
C. Puccinia striiformis *D. Puccinia malvacearum*

63. Aeciospores of black rust of wheat are produced on?

A. Wheat B. Barberry
C. Dandelion D. Crabgrass

64. Uredospores are?

A. Triple celled B. Bi-celled
C. Single celled D. Tetra celled

65. Sterile hymenium layer which originate from the base of the cavity are known as?

A. Trichogyne B. Rhizoids
C. Periphyses D. Paraphyses

66. In fungi, nuclear membrane does not disappear but constricts like a dumbbell during neuclear division. This phenomenon is called,

A) Meiosis B) Karyogamy
C) Karyochoresis D) Parasexuality

67. In parasexuality, genetic recombination occurs by,

A) Meiosis B) Mitotic crossing over
C) Karyogamy D) None of the above

68. Aplanospores are mostly formed in

A) Aquatic fungi B) Terrestrial fungi
C) Amphibious fungi D) None of the above

69. The flagellum of fungi has a typical

A) 9+2 Structure B) 9+3 structure
C) 9+1 structure D) 9+4 structure

70. The germinating teliospore is called

A) Epibasidium B) Hypobasidium
C) Basidiospores D) Basidial apparatus

71. Parenthesome is found in

A) Ascomycota B) Basidiomycota
C) Zygomycota D) None of the above

72. Uredospores in *Puccinia graminis* are

A) Oval with four equatorial germ pores

B) Round with 7-10 scattered germ pores
C) Round with 6-10 scattered germ pores
D) Oval with 4 scattered germ pores

73. Physiological races is given by,
A) Erikson B) Stakman and Levine
C) K.C. Mehta D) None of the above

74. Loose smut of wheat is
A) Internally seed borne B) Soil borne
C) Externally seed borne D) None of the above

75. Imperfect fungi multiply only by,
A) Conidia B) Ascospores
C) Basidiospores D) Teliospores

76. Dimorphism is observed in the order
A) Agaricales B) Uriedinales
C) Pezizales D) Saprolegniales

77. Plasmodiophora brassicae is
A) Saprophyte B) Facultative
C) Obligate D) None of the above

78. The ergot alkaloids is
A) Lysergic acid diethylamide B) Morphine
C) Atropine D) Quinine

79. Turkey X disease is caused due to the mycotoxin
A) ochratoxin B) Aflatoxin
C) Vomitoxin D) None of the above

80. Fused conidiophores in Ascomycetes are called
A) Synnema B) Coremium
C) Sporodochium D) Sporangia

81. The hair like outgrowth in ascogonia is called
A) Ascogenous hyphae B) Trichogyne
C) epiplasm D) None of the above

82. Storage fungi
A) Penicillium B) Phytophthora
C) Alternaria D) Aspergillus

83. The antibiotic griseofulvin is produced by
A) *Penicillium notatum* B) *Penicillium griseofulvum*
C) *P. roqueforti* D) *P. camemberti*

84. The most common type of life cycle found in majority of fungi and ascomycetes is-
A) Asexual cycle B) Haploid cycle

C) Haploid cycle with restricted dikaryon
D) Dikaryotic cycle

85. Haploid-diploid cycle, a characteristic of algae, occurs only in which of the two groups of fungi?
A) Blastocladiales and Saccharomyces cerevisiae
B) Rhizophydiales and Spizellomycetales
C) Blastocladiales and Rhizophydiales
D) None of the above

86. In which of the fungus, parasexuality was demonstrated?
A) Aspergillus and Penicillium B) Schizosaccharomyces
C) Oomyctes and Hyphochytriomycetes
D) Allomyces

87. Choose the correct statement with reference to the characteristics of the phylum Basidiomycota.
A) It produces basidiospores.
B) Formation of clamp connections on the dikaryotic phase.
C) The presence of the dolipore septa
D) All of the above

88. The order Erysiphales comes under which phylum?
A) Basidiomycota B) Ascomycota
C) Chytridiomycota D) Zygomycota

89. Which spore is a club and results from the fusion of two nuclei from different strains of the same fungi?
A) Ascospore B) Basidiospore
C) Blastospore D) Conidiospore

90. Basidiospores have a minute projection near the point of attachment to the sterigma is known as –
A) Promycelium B) Sterigmata
C) Clamp connection D) Hilar appendix

91. Which fungal genus is commonly known as 'shot-gun fungus or hat thrower'?
A) Aspergillus B) Copropus
C) Pilobolus D) Botrytis

92. Circadian rhythmic phenomenon is found in –
A) Phytophthora B) Pilobolus
C) Cercospora D) Coprinus

93. Dimorphism or diplanetism is a characteristic feature of –
A) Mucor B) Saprolegnia
C) Aspergillus D) Alternaria

94. Choose the correct statement with reference to the characteristics features of Oomycota?
i) Diploid somatic phase \

ii) Laterally biflagellate zoospores with one tinsel type flagellum.
iii) Mycolaminarin as storage product
iv) Cell wall made of glucan-cellulose.

A. i and ii are correct. B. ii and iii correct.
C. Only iii is correct. D. i, ii, iii and iv are correct.

95. Tetrapolar heterothallism is mostly seen in which phylum of the fungus?

A) Ascomycota B) Basidiomycota
C) Oomycota D) Zygomycota

96. The flask shaped asexual fruiting body of Ascomycotina fungi is known as-

A) Acervulus B) Pycnidia
C) Sporodochia D) Synnema

97. Which of the 3 classes of the subphylum Agaricomycotina are included under the phylum Basidiomycota?

A. Agaricomycetes, Dacrymycetes, Tremellomycetes.
B. Agaricomycetes, Dacrymycetes, Pucciniomycetes.
C. Agaricomycetes, Tremellomycetes, Ustilaginomycetes.
D. Exobasidiomycetes, Agaricomycetes, Dacrymycetes.

98. Which subphylum is regarded as the crown group of fungi?

A. Pezizomycotina B. Agaricomycotina
C. Pucciniomycotina D. Ustilaginomycotina

99. Pocket plum disease of plum fruits is caused by which species under the genus Taphrina?

A. Taphrina deformans *B. Taphrina pruni*
C. Taphrina epiphylla D. None of the above

100. Choose the correct statement with reference to the characteristics of the phylum Chytridiomycota?

i) They are the smallest, simplest and most primitive fungi.
ii) Production of motile zoospores having a single posterior whiplash flagellum.
iii) The coenocytic thallus, which may be an oval multinucleate cell or a small elongated hypha
iv) The Laterally biflagellate zoospores with one tinsel type flagellum.

A. i and ii are correct. B. ii and iii are correct
C. i, ii and iii are correct. D. All the statements are correct.

101. Two allele or bipolar heterothallism is found in?

A. Mucorales (Mucor, Rhizopus, Phycomyces)
B. Ascomycota (Neurospora, Ascobolous)
C. Both Mucorales and Ascomycota
D. None of the above.

102. White blisters and downy mildew diseases are caused by which order of the fungus?

A. Pythiales B. Saprolegniales
C. Peronosporales D. Phallales.

103.Which is the second largest rust genus with 800 species?

A. Uromyces B. Melampsora

C. Puccinia D. Gymnosporangium

104. Who is regarded as the father of Indian mycology?

A) E.F. smith B) J.F. Dastur

C) B.B. Mundkur D) E.J. Butler

105. Parasexuality was first discovered by

A) Pontecarvo B) Erikson

C) De Bary D) Robert Koch

106. Which one of the following is referred to as water moulds?

A) Oomycetes B) Zygomycetes

C) Ascomycetes D) basidiomycetes

107.A motile asexual spore that uses a flagellum for locomotion is termed

A) Ospores B) Zygospores

C) Zoospores D) Sporangiospores

108. Dolipore Septum is found in

A) Ascomycetes B) Zygomycetes

C) Basidiomycetes D) Deuteromycetes

109. Basidiospores are

A) Diploid B) Polyploid

C) Haploid D) None of the above

110. Parasexual phenomenon was discovered in which of the following

A) Aspergillus niger B) A. nidulans

C) A. glauces D) A. fumigates

111. which one of the following types of reproduction is found in Chytridiomycetes?

A) Sexual B) Asexual

C) Both A and B D) Parasexual

112. Chlamydospores are produced always by

A) Primary mycelium B) Secondary mycelium

C) Tertiary mycelium D) None of the above

113. Puccinia graministritici produces the following spores form on *Barberry vulgaris*

A) Pycnia + Aecia B) Only aecia

C) Only pycnia D) Uredial + Telial

114. The fungus responsible for ergotism belongs to which of the following fungal divisions?

A) Ascomycota B) Basidiomycota

C) Deuteromycota D) Zygomycota

115. which of the following fungi is known as" weed of the laboratory"

A) Aspergillus B) Nurospora

C) Both (a) and (b) D) None of the above

116. Cleistothecium containing several asci bearing definite appendages with coiled tips is characteristics of genus

A) Uncinula B) Erysiphe
C) Sphaerotheca D) Phyllactinia

117.The number of ascospore produced in a typical asci are

A) 4 B) 8
C) innumerable D) 12

118.Rice blast pathogen perfect stage is

A) *Pyriculariaoryzae* B) *Magnaporthe grisea*
C) *Helminthosporiumoryzae* D) *Rhizoctonia solani*

119. The stem fungus *Puccinia graminis tritici* enters through

A) Stomata B) Lenticles
C) Trichomes D) Hydathodes

120.Sterile threads arises at the base of the perithecium, upward direction between asci

A) Periphysis B) Paraphysis
C) Periphysoid D) None of the above

121.The sexual spore of *Pythium aphanidermatum* is

A) Zoospore B) Zygospore
C) Oospore D) Ascospore

122.The principal method of ontrolling plant disease are

A) Avoidance B) Exclusion
C) Eradication D) All the above

123. Which one of the following is most deadliest mushroom

A) *Amanita muscaria* *B)* *Agaricusbisporus*
C) *Pleurotus spp.* *D)* *Lentinula edodes*

124. Who is known as the father of Tropical plant Pathology

A) *NA Cobb* *B)* *Anton de Bary*
C) *HM Ward* *D)* *E M Fries*

125. The first complete genome sequencing of a plant pathogenic fungus is

A. *Magnaporthe grisea* B. *Neurospora crassa*
C. *Phytophthora infestans* D. *Puccinia graminis*

126. Who is a Great grandfather of Phytopathology

A. Pier Antonio Micheli B. Matheiu Du Tillet
C. E M Fries D. Leeuwenhoek

127. Who coined the term “Vertifolia effect”

A. J. C. Luthra B. Pontecorvo
C. Vander Plank D. Von Schmeling

128. Lichen is an association between

A. Fungus and roots of higher plants
B. Fungus and algae

C. Bacteria and Fungus
D. None of the above

129. Mode of entry of the fungus *Ustilago tritici*
A. Roots Hair B. Stigma
C. Epidermis D. Stigma and young ovary walls

130. Small fragment of the hypha detached from the parent mycelium to grow into new thallus, the small fragment are called
A. Oidia or Arthrospores B. Conidiospores
C. Sporangiophore D. Sporangia

131. Spitzenkorper is found in
A. Oomycetes B. Zygomycetes
C. Phycomycetes D. Septed Fungi

132. The rust genera which lacks the uredinial state are called as
A. Demicyclic B. Microcyclic
C. Nuclear Cycle D. Macrocyclic

133. What is the causal agents of orange or brown rust of wheat, which is quite common on wheat in India
A. *Puccinia recondita* B. *Puccinia striiformis*
C. *Puccinia graminis* D. *Puccinia glumarum*

134. Which one the following is not true about *Gymnosporangium juniper-virginianae*
A. Primary host is juniper, alternate host is apple
B. Uredospores are not produced
C. Teliospores germinate without resting period
D. None

135. Which one of the following is most deadly mushroom
A. *Amanita muscaria* B. *Agaricus bisporus*
C. *Pleurotus* spp. D. *Lentinula edodes*

136. Who is known as the father of Tropical plant Pathology
A. NA Cobb B. Anton de Bary
C. HM Ward D. E M Fries

137. The first book on plant pathology was written by
A. Anton de Bary B. RS Singh
C. E J Butler D. JG Kuhn

138. Any compound produced by a microorganism which is toxic to the plant is called?
A. Phytotoxin B. Vivotoxin
C. Pathotoxin D. Tabtoxin

139. Which of the following is used by fungi to absorb nutrients from cells of plants hosts?
A. Appressorium B. Haustorium
C. Rhizomorph D. Infection peg

140. The time gap between infection and the first reproduction of the pathogen in the host is called?
A. Local infection B. Systemic infection
C. Colonization D. Fructification

141. Single celled, thick walled resting spores are called?
A. Conidia B. Spore
C. Chlamydospore D. Sclerotia

142. Heterothallism was discovered by-
A. A.F. Blackslee B. P.A. Micheli
C. Anton De Bary D. Persoon

143. Dutch elm disease are transmitted by-
A. Scolytid beetles B. Stainer bug
C. Nematode D. Elm Bark beetle

144. Ergot by *Claviceps* produces
A. Ergotoxin toxic to human and other animals
B. Alkaloids that are used as medicine
C. Hallucinogenic drug LSD
D. All of the above

145. Biosynthetic pathway that is present in Oomycetes is?
A. Glucose B. Fructose
C. Lysine D. Glycogen

146. The sterols that are present in Oomycetes is?
A. Ergosterol B. Fucosterol
C. Oligosterol D. None of the above

147. Which of the following are known as water molds?
A. Leptomitales B. Saprolegniales
C. Rhipidales D. None of the above

148. *Sclerospora graminicola* (green ear of Bajra) in India was reported by?
A. Mundukar BB B. Butler EJ
C. Ward HM D. None of the above

149. Pataulin- secondary metabolite is produced by which type of organism?
A. *Penicillium chrysogenum* *B.* *Penicillium ochraceus*
C. *Penicillium expansum* D. None of the above

150. Cephalosporin - secondary metabolite is produced by which type of organism?
A. *Acremoium chrysogenum* *B.* *Penicillium ochraceus*
C. *Penicillium expansum* D. None of the above

151. Kojic acid - secondary metabolite is produced by which type of organism?
A. *Acremoiumchrysogenum* *B.* *Penicillium ochraceus*
C. *Aspergillus flavus* D. None of the above

152. Parasexual genetic recombination in *D.discoideum* was discovered by?
A. Pontecorvo and Roper B. Sinha and Ashworth

C. Ainsworth and Bisby D. None of the above

153. Ovulariopsis is an anamorph of?
A. Leveilulla B. Phyllactinia
C. Podosphora D. None of the above

154. Oidiopsis is an anamorph of?
A. Leveilulla B. Phyllactinia
C. Podosphora D. None of the above

155. Oidium is an anamorph of?
A. Leveilulla B. Phyllactinia
C. Podosphora D. None of the above

156. ——————————is known as candle snuff fungus?
A. *X. hypoxylon* B. *X. polymorpha*
C. *X. digitata* D. None of the above

157. Most of the fungi have a filamentous vegetative body called as
A. Hyphae B. Mycelium
C. Flagella D. Plasmodium

158. Some of the spores can swim by means of flagella known as
A. Oospores B. Zoospores
C. Meiospores D. Zygospore

159. Examples of hemibiotrophs are
A. Venturia inequalis B. Powdery mildew
C. Downy mildew D. All of the above

160. ——————————is known as dead mans finger fungus?
A. *X. hypoxylon* B. *X. polymorpha*
C. *X. digitata* D. None of the above

161. Who discovered heterothallism in mucors?
A. Pontecorvo and Roper B. AF Blackslee
C. De Bary D. None of the above

162. The book Systema mycologicum was written by?
A. Linnaeus B. EM Fries
C. Tulsane LR D. None of the above

163. Linneaus of mycology is called by whom?
A. Linnaeus B. EM Fries
C. Tulsane LR D. None of the above

164. Fungi imperfecti the group was created by?
A. Linnaeus B. EM Fries
C. Fuckel D. None of the above

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CHAPTER 4
FUNDAMENTALS OF MYCOLOGY

1. (Ans: A, *Amanita phalloides;* Source: A textbook of fungi, bacteria and virus by H.C Dube pg.no 8)
2. (Ans: B, Antonio Micheli; Source: A textbook of fungi, bacteria and virus by H.C Dube pg.no 8)
3. (Ans: C, 1845, Ireland; Source: A textbook of fungi, bacteria and virus by H.C Dube pg.no 8)
4. (Ans: A, Alexander Fleming, 1928; Source: A textbook of fungi, bacteria and virus by H.C Dube pg.no 9)
5. (Ans: C, *Saccharomyces cerevisiae*; Source: A textbook of fungi, bacteria and virus by H.C Dube pg.no 9)
6. (Ans: C, Both A and B; Source: A textbook of fungi, bacteria and virus by H.C Dube pg.no 11)
7. (Ans: C, Heterotrophic and absorptive; Source: A textbook of fungi, bacteria and virus by H.C Dube pg.no 10)
8. (Ans: C, Chitin and Cellulose; Source: A textbook of fungi, bacteria and virus by H.C Dube pg.no 10)
9. (Ans: B, Dolipore septum; Source: A textbook of fungi, bacteria and virus by H.C Dube pg.no 14)
10. (Ans: B, Coenocytic condition; Source: A textbook of fungi, bacteria and virus by H.C Dube pg.no 14)
11. (Ans: B, Polymer of N-acetyl glucosamine units; Source: A textbook of fungi, bacteria and virus by H.C Dube pg.no 15)
12. (Ans: B, Dikaryon; Source: A textbook of fungi, bacteria and virus by H.C Dube pg.no 16)
13. (Ans: B, Fusion between 2 sexual cells; Source: A textbook of fungi, bacteria and virus by H.C Dube pg.no 20)
14. (Ans: A, 2 nuclei; Source: A textbook of fungi, bacteria and virus by H.C Dube pg.no 20)
15. (Ans: C, Gametangiogamy; Source: A textbook of fungi, bacteria and virus by H.C Dube pg.no 21)
16. (Ans: A, Zygospore; Source: A textbook of fungi, bacteria and virus by H.C Dube pg.no 21)
17. (Ans: B, Oospore; Source: A textbook of fungi, bacteria and virus by H.C Dube pg.no 21)

18. (Ans: B, Dung; Source: A textbook of fungi, bacteria and virus by H.C Dube pg.no 23)
19. (Ans: B, Debary; Source: A textbook of fungi, bacteria and virus by H.C Dube pg.no 25)
20. (Ans: A, Louis Pasteur; Source: A textbook of fungi, bacteria and virus by H.C Dube pg.no 26)
21. (Ans: D, All of the above; Source: A textbook of fungi, bacteria and virus by H.C Dube pg.no 27)
22. (Ans: B, A.F. Blakeslee; Source: A textbook of fungi, bacteria and virus by H.C Dube pg.no 32)
23. (Ans: A, Rhizopus; Source: A textbook of fungi, bacteria and virus by H.C Dube pg.no 34)
24. (Ans: B, Trichogyne; Source: A textbook of fungi, bacteria and virus by H.C Dube pg.no 42)
25. (Ans: A, Crook cell; Source: A textbook of fungi, bacteria and virus by H.C Dube pg.no 43)
26. (Ans: B, Thallus; Source: Fundamentals of Phytopathology by D. Alice, C. Jeyalakshmi, A.S. Krishnamoorthy and M. Karthikeyan, Page: 61)
27. (Ans: A, 80s Source: Fundamentals of Phytopathology by D. Alice, C. Jeyalakshmi, A.S. Krishnamoorthy and M. Karthikeyan, Page: 63)
28. (Ans: C, *Amorphotheca resina*e; Source: An Introduction to Mycology by Aneja and Mehrotra, Page: 619)
29. (Ans: D, Aflatoxicoses; Source: An Introduction to Mycology by Aneja and Mehrotra, Page: 623)
30. (Ans: B, Cardiac Beri-beri Man; Source: An Introduction to Mycology by Aneja and Mehrotra, Page: 623)
31. (Ans: C, *Aspergillus flavus*; Source: An Introduction to Mycology by Aneja and Mehrotra, Page: 623)
32. (Ans: B, *Epicoccum granulatum*; Source: An Introduction to Mycology by Aneja and Mehrotra, Page: 617)
33. (Ans: B, *Aspergillus nidulans*; Source: An Introduction to Mycology by Aneja and Mehrotra, Page: 580)
34. (Ans: D, *Cochliobolus victoriae*; Source: An Introduction to Mycology by Aneja and Mehrotra, Page: 282)
35. (Ans: A, Dirty; Source: Modern Plant Pathology by H.C Dube, Page: 491)
36. (Ans: C, Both A and B; Source: Modern Plant Pathology by H.C Dube, Page: 492)
37. (Ans: D, All of the above; Source: Modern Plant Pathology by H.C Dube, Page: 492)
38. (Ans: A, Entorrhizales; Source: Modern Plant Pathology by H.C Dube, Page: 493)

39. (Ans: C, Epibasidium; Source: Modern Plant Pathology by H.C Dube, Page: 496)
40. (Ans: B, Dikaryotization; Source: Fundamentals of Phytopathology by D. Alice, C. Jeyalakshmi, A.S. Krishnamoorthy and M. Karthikeyan, Page: 79)
41. (Ans: C, Globose; Source: Fundamentals of Phytopathology by D. Alice, C. Jeyalakshmi, A.S. Krishnamoorthy and M. Karthikeyan, Page: 83)
42. (Ans: A, *Magnaporthe grisea*; Source:Modern Plant Pathology by H.C Dube, Page: 298)
43. (Ans: B, Blast disease; Source: Modern Plant Pathology by H.C Dube, Page:298)
44. (Ans: B, *Uromyces fabae*; Source: Modern Plant Pathology by H.C Dube, Page:537)
45. (Ans: D, *Gymnosporangium juniperi-virginianae*; Source:Modern Plant Pathology by H.C Dube, Page:537)
46. (Ans: A, Tinsel type flagella (Fungi, Bacteria and viruses by H. C Dube; page 20)
47. (Ans: B, Carbendazim (Fungicide and their application, IASRI, e-course)
48. (Ans: A, Teliospores (Fungi, Bacteria and viruses by H. C Dube; page 71)
49. (Ans: B, Sterigmata (Fungi, Bacteria and viruses by H. C Dube; page 70)
50. (Ans: C, Uredospore (Fungi, Bacteria and viruses by H. C Dube; page 79)
51. (Ans: B, Colletotrichum (Fungi, Bacteria and viruses by H. C Dube; page 111)
52. (Ans: D, *Alternaria* (Fungi, Bacteria and viruses by H. C Dube; page 109)
53. (Ans: A, *Rhizopus* (Fungi, Bacteria and viruses by H. C Dube; page 35)
54. (Ans: C, Diploid (Fungi, Bacteria and viruses by H. C Dube; page 17)
55. (Ans: B, Cleistothecium (Fungi, Bacteria and viruses by H. C Dube; page 46)
56. (Ans: C, *Pilobolus* (Fungi, Bacteria and viruses by H. C Dube; page 36)
57. (Ans: B, *Amanita phalloides* (Fungi, Bacteria and viruses by H. C Dube; page 8)
58. (Ans: A, *Agaricus bisporus*
59. (Ans: B, 4 (Fungi, Bacteria and viruses by H. C Dube; page 81)
60. (Ans: C, 8 (Fungi, Bacteria and viruses by H. C Dube; page 45)
61. (Ans: D, Ascomycota (An Introduction to Mycology by Aneeja&Mehrotra; Page 158)
62. (Ans: A, *Puccinia recondita* (Fungi, Bacteria and viruses by H. C Dube; page 77)
63. (Ans: B, Barbery (Fungi, Bacteria and viruses by H. C Dube; page 81)
64. (Ans: C, Single celled (Fungi, Bacteria and viruses by H. C Dube; page 81)
65. (Ans: D, Paraphyses (Fungi, Bacteria and viruses by H. C Dube; page 77)
66. Ans: C, Karyochoresis; source- A text book of fungi, bacteria and viruses ,pg;15)
67. Ans: B, Mitotic crossing over; source- A text book of fungi, bacteria and viruses ,pg;17)
68. Ans: B, Terrestrial fungi; source- A text book of fungi, bacteria and viruses, pg;19)
69. Ans: A, 9+2 structure; source- A text book of fungi, bacteria and viruses, pg;19)
70. Ans: B, Hypobasidium; source- A text book of fungi, bacteria and viruses, pg;74)
71. Ans: B, Basidiomycota; source- A text book of fungi, bacteria and viruses, pg;72)
72. Ans: A, Oval with four equatorial germ spore; source- A text book of fungi, bacteria and viruses ,pg;83)

73. Ans : B, Stakman and Levine; source- A text book of fungi, bacteria and viruses ,pg;85)
74. Ans: A, Internally seed borne; source- A text book of fungi, bacteria and viruses ,pg;89)
75. Ans: A, Conidia; source- A text book of fungi, bacteria and viruses ,pg;108)
76. Ans: D, Saprolegniales; source- A text book of fungi, bacteria and viruses ,pg;119)
77. Ans: C, Obligate; source- Plant pathology by G N agrios, pg; 405)
78. Ans: A, Lysergic acid diethylamide; source- Plant pathology by G N agrios ,pg;37)
79. Ans : B, Aflatoxin; source- Plant pathology by G N agrios ,pg;41)
80. Ans: A, Synnema; source- A text book of fungi, bacteria and viruses, pg; 42)
81. Ans: B, Trichogyne; source- A text book of fungi, bacteria and viruses ,pg;42)
82. Ans: D, *Aspergillus*; source- A text book of fungi, bacteria and viruses ,pg;56)
83. Ans: B, *Penicillium griseofulvum*; source- A text book of fungi, bacteria and viruses ,pg;59)
84. (Ans: B, Haploid cycle; Source: Book: HC Dube, An Introduction to Fungi, page: 39)
85. (Ans: A, Blastocladiales and *S. cerevisiae*; Source: Book: HC Dube, An Introduction to Fungi, page: 41)
86. (Ans: A, *Aspergillus* and *Penicillium*; Source: Book: HC Dube, An Introduction to Fungi, page: 41)
87. (Ans: D, All of the above; Source: Book: A textbook of fungi, bacteria and viruses, page: 70)
88. (Ans: B, Ascomycota; Source: Book: A textbook of fungi, bacteria and viruses, page: 52)
89. (Ans: B, Basidiospore; Source: Book: HC Dube,A textbook of fungi, bacteria and viruses, page: 73)
90. (Ans: D, Hilar appendix; Source: Book: H.C. Dube, An Introduction to fungi, page: 280)
91. (Ans: C, *Pilobolus*; Source: Book: HC Dube,A textbook of fungi, bacteria and viruses, page: 36)
92. (Ans: B, *Pilobolus*; Source: Book: HC Dube, A textbook of fungi, bacteria and viruses, page: 36)
93. (Ans: B, *Saprolegnia*; Source: Book: HC Dube,A textbook of fungi, bacteria and viruses, page: 36)
94. (Ans: D, i, ii, iii, iv are correct; Source: Book: HC Dube, An Introduction to Fungi, page: 406)
95. (Ans: B, Basidiomycota; Source: Book: HC Dube, A textbook of fungi,bacteria and viruses, page: 142)
96. (Ans: B, Pycnidia; Source: Book: HC Dube, An Introduction to Fungi, page: 271)

97. (Ans: A, Agaricomycetes, Dacrymycetes, Tremellomycetes; Source: Book: HC Dube, An Introduction to Fungi, page: 293)
98. (Ans: A, Pezizomycotina; Source: Book: HC Dube, An Introduction to Fungi, p age: 177)
99. (Ans: B, *Taphrina pruni*; Source: Book: HC Dube, An Introduction to Fungi, page: 161)
100. (Ans: C, i, ii, iii are correct; Source: Book: HC Dube, An Introduction to Fungi, page: 57)
101. (Ans: C, Both Mucorales and Ascomycota; Source: Book: HC Dube, A textbook of Fungi, Bacteria and Viruses, page: 141)
102. (Ans: C, Peronosporales; Source: Book: HC Dube, A textbook of Fungi, Bacteria and Viruses, page: 133)
103. (Ans: A, *Uromyces;* Source: Book: HC Dube, An Introduction to fungi, Page: 381)
104. (Ans: D, E.J.Butler; Source: principles of plant pathology-R.S. Singh, Page no: 28)
105. (Ans: A, Pontecorvo; Source: Fungi bacteria & viruses-H.C. Dube, Page no: 9)
106. (Ans: A, Oomycetes; Source: G.N Agrios, Page no: 391)
107. (Ans: C, Zoospores; Source: G.N Agrios, Page no: 390)
108. (Ans: C, Basidiomycetes; Source: Fungi bacteria and virus- H.C. Dube, Page no: 70)
109. (Ans: C, Haploid; Source: Fungi bacteria and virus- H.C. Dube, Page no: 71)
110. (Ans: B, *A. nidulans*; Source: Fungi bacteria and virus- H.C. Dube, Page no: 143)
111. (Ans: C, Both A and B; Source: Fungi bacteria and virus- H.C. Dube, Page no: 29)
112. (Ans: B, Secondary mycelium; Source: principles of plant pathology-R.S. Singh, Page no: 37)
113. (Ans: A, Pycnia + Aecia; Source: G.N Agrios, Page no: 570)
114. (Ans: A, Ascomycota; Source: Fungi bacteria and virus- H.C. Dube, Page no: 55)
115. (Ans: C, *Aspergillus*; Source: Fungi bacteria and virus- H.C. Dube, Page no: 55)
116. (Ans: A, *Uncinula*; Source: Fungi bacteria and virus- H.C. Dube, Page no: 54)
117. (Ans: B, 8; Source: Fungi bacteria and virus- H.C. Dube, Page no: 45)
118. (Ans: B, *Magnaporthe grisea*; Source: Plant Pathology, Satvinder Kaur Mann, Prem Lal Kashyap, Santosh Singh Kang, Page: 6)
119. Ans: A, Stomata; Source: A text book on Fungal, Bacteria and viruses- H.C Dube, Page no: 77
120. Ans: C, Paraphysis; Source: A text book on Fungal, Bacteria and viruses- H.C Dube, Page no: 47
121. Ans: C, Oospore; Source: A text book on Fungal, Bacteria and viruses- H.C Dube, Page no: 126
122. Ans: D, All the above; Source: principles of plant pathology-R.S. Singh, Page no: 303
123. Ans: A, *Amanita muscarina;* An introduction to Mycology, K.R. Aneja and R. S. Mehrotra, Page: 378)

124. Ans: C, H.M.Ward; Source: Plant Pathology, Satvinder Kaur Mann, Prem Lal Kashyap, Santosh Singh
125. Ans: A, *Magnaporthe grisea;* Source: Plant Pathology, Satvinder Kaur Mann, Prem Lal Kashyap, Santosh Singh Kang, Page: 6)
126. (Ans: B, Matheiu Du Tillet; Source: Fundamentals of Plant Pathology, D. Alice, C. Jeyalakshmi, Page: 3)
127. (Ans: C, Vanderplank; Source: Fundamentals of Plant Pathology, D. Alice, C. Jeyalakshmi, Page: 11)
128. (Ans: B, Fungus and Algae; Source: Fundamentals of Plant Pathology, D. Alice, C. Jeyalakshmi, Page: 31)
129. (Ans: D, Stigma and young ovary walls; Source: Fundamentals of Plant Pathology, D. Alice, C. Jeyalakshmi, Page: 46)
130. (Ans: A, Oidia and Arthrospores; Fundamentals of Plant Pathology, D. Alice, C. Jeyalakshmi, Page: 71)
131. (Ans: D, Septed fungi; Source: An introduction to Mycology, K.R. Aneja and R. S. Mehrotra, Page: 18)
132. (Ans: A, Demicyclic; Source: An introduction to Mycology, K.R. Aneja and R. S. Mehrotra, Page: 310)
133. (Ans: A, *Puccinia recondita*; Source: An introduction to Mycology, K.R. Aneja and R. S. Mehrotra, Page: 318)
134. (Ans: D, None; Source: An introduction to Mycology, K.R. Aneja and R. S. Mehrotra, Page: 323)
135. (Ans: A, *Amanita muscarina*; Source: An introduction to Mycology, K.R. Aneja and R. S. Mehrotra, Page: 378)
136. (Ans: C, HM. Ward; Source: Plant Pathology, Satvinder Kaur Mann, Prem Lal Kashyap, Santosh Singh Kang, Page: 3)
137. (Ans: D, Kuhn; Source: Fundamentals of Plant Pathology, D. Alice, C. Jeyalakshmi, Page: 7)
138. (Ans: A, Phytotoxin; Source: Fundamentals of Plant Pathology, D. Alice, C. Jeyalakshmi, Page: 39)
139. (Ans: B, Haustorium; Source: Fundamentals of Plant Pathology, D. Alice, C. Jeyalakshmi, Page: 45)
140. (Ans: D, Fruitification; Source: Fundamentals of Plant Pathology, D. Alice, C. Jeyalakshmi, Page: 49)
141. (Ans: C, Chlamydospores; Source: Fundamentals of Plant Pathology, D. Alice, C. Jeyalakshmi, Page: 73)
142. (Ans: A, A.F.Blakeslee; Source: Fundamentals of Plant Pathology, D. Alice, C. Jeyalakshmi, Page: 119)
143. (Ans: D, Elm Bark Beetle; Source: Fundamentals of Plant Pathology, D. Alice, C. Jeyalakshmi, Page:55)

144. (Ans: D, All of the above; Source: An introduction to Mycology, K.R. Aneja and R. S. Mehrotra, Page: 2)
145. (Ans: C, Lysine; Source: Introduction toFungi HC Dube pg.no- 406)
146. (Ans: B, Fucosterol; Source: Introduction toFungi HC Dube pg.no- 406)
147. (Ans: B, Saprolegniales; Source: Introduction toFungi HC Dube pg.no- 409)
148. (Ans: B, Butler E.J; Source: Introduction toFungi HC Dube pg.no- 423)
149. (Ans: C, *Penicillum expansum*; Source: Introduction toFungi HC Dube pg.no- 512)
150. (Ans: A, *Acremonium chrysogenum*; Source: Introduction toFungi HC Dube pg.no- 512)
151. (Ans: C, *Aspergillus flavus*; Source: Introduction toFungi HC Dube pg.no- 512)
152. (Ans: B, Sinha and Ainsworth; Source: Introduction toFungi HC Dube pg.no- 441)
153. (Ans: B, *Phyllactinia*; Source: Introduction toFungi HC Dube pg.no- 219)
154. (Ans: A, *Leveilulla*; Source: Introduction to Fungi HC Dube pg.no- 219)
155. (Ans: C, *Podospora*; Source: Introduction to Fungi HC Dube pg.no- 219)
156. (Ans: A, *X. hypoxylon*; Source: Introduction to Fungi HC Dube pg.no- 239)
157. (Ans: B, Mycelium; Source: G.N Agrios, pg.no- 388)
158. (Ans: B, Zoospores; Source: G.N Agrios, pg.no- 388)
159. (Ans: A, *Venturia inaequalis*; Source: G.N Agrios, pg.no- 388)
160. (Ans: B, *X. polymorpha*; Source: Introduction toFungi HC Dube pg.no- 239)
161. (Ans: B, A.F.Blakeslee; Source: Introduction toFungi HC Dube pg.no- 10)
162. (Ans: B, E.M.Fries; Source: Introduction toFungi HC Dube pg.no- 13)
163. (Ans: B, E.M.Fries; Source: Introduction toFungi HC Dube pg.no- 13)
164. (Ans: C, Fuckel; Source: Introduction toFungi HC Dube pg.no- 406)

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CHAPTER 5
BASIC BACTERIOLOGY

1. Which of the following is the first bacterial disease?
   A. Moko wilt of banana B. Black rot of cabbage
   C. Fire blight of apple D. None of the above.
2. Number of chromosomes present in bacteria is:
   A. 1 B. >1
   C. <1 D. 2
3. What is the shape of *Micrococcus*?
   A. Spherical B. Oval
   C. Coccoid D. All of the above
4. In which year did the 2nd edition of *The Systematics* was published?
   A. 1996 B. 2000
   C. 2004 D. 1990
5. Who is known as the Father of Modern Bacteriology?
   A. Antony Van Leeuwenhoek B. Louis Pasteur
   C. Hook D. None of the above
6. In which year Antony Van Leeuwenhoek invented the simple microscope?
   A. 1820 B. 1667
   C. 1910 D. 1676
7. The spherical bacterium is known as:
   A. Bacillus B. Coccus
   C. Spirillum D. Vibrio
8. The cell wall is surrounded, in some bacteria, by a polysaccharide in the form of a definite layer called:
   A. Capsule B. Flagella
   C. Pili D. None of the above
9. Diauxic growth in bacteria occurs when bacterium is provided with two substrates
   A. Glucose B. Sucrose
   C. Both (A) and (B) D. None of the above
10. The elicitor of *Ralstoniasolanacearum* is
   A. Harpin B. PopA1
   C. HarpinS D. Both (A) and (C)

11. The elicitor of *Erwiniaamylovora* is

A. Harpin B. PopA1
C. HarpinS D. Both (A) and (C)

12. The elicitor of *Pseudomonas syringae* is

A. Harpin B. PopA1
C. HarpinS D. Both (A) and (C)

13. Avr gene of *Xanthomonascampestris*pv. phaseoli is:

A. *AvrXp1* *B.* *avrB5*
C. Both (A) and (B) *D.* None of the above

14. Photolithotrophs are genereally

A. Auxotrophic B. Heterotrophic
C. Chemotrophic D. Organotrophic

15. *Ralstonia* belongs to the family

A. *Burkholderiacea* *B.* *Comamonadaceae*
C. *Xanthomonadaceae* *D.* *Pseudomonadaceae*

16. The first edition of *Bergeys's Manual of Determinative Bacteriology* was published in:

A. 1923 B. 1901
C. 1885 D. 1675

17. Spirochaetes causes diseases in humans are:

A. Jaundice B. Syphilis
C. Malaria D. Both (A) and (B)

18. *Penicillin* was discovered by

A. Antony Van Leeuwenhoek B. Louis Pasteur
C. Robert Koch D. Alexander Fleming

19. Who was the originator of *Bergeys's Manual of Determinative Bacteriology* in 1923?

A. David, H. Bergey B. Hooke
C. Robert Koch D. Louis Pasteur

20. The Gummosis of sugarcane is caused by

A. *Xanthomonasaxonopodis*pv. *vasculorum*
B. *Xanthomonascitri*
C. *Ralstoniasolanacearum*
D. *Bacillus* spp.

21. Which of the following is highest percentage in cytoplasmic membrane of bacteria?

A) Lipid B) Carbohydrates
C) Protein D) Sterols

22. Thickness of bilayers of phospholipid in cytoplasmic membrane?

A) 1-2nm B) 2-4nm

C) 3-4 nm D) 4 nm

23. Thickness of murein in gram negative bacteria?
A) 15-25% B) 20-25%
C) 25-35% D) 35%

24. Bacterial plasmid consist of?
A) dsRNA B)ssRNA
C) ssDNA D) dsDNA

25. Total number of flagellar rings in gram positive bacteria?
A) 1 B) 2
C) 3 D) 4

26. Organ of attachment for bacterial genophore during replication?
A) Plasmid B) Mesosomes
C) flagella D) fimbriae

27. Anaerobic endospore forming bacteria?
A) Bacillus B) Clostridium
C) Clavibacter D) None of the above

28. Type of flagella in *Agrobacterium*?
A) Monotrichous B) Amphitrichous
C) Sub polar D) Peritrichous

29. The genus Erwinia belongs to the family?
A) Enterobacterioceae B) Xanthomonaceae
C) Pseudomonadaceae D) Staphylococcaceae

30. Which ring is referred to as 'rotor' in flagella?
A) L ring B) P ring
C) S ring D) M ring

31. The phenomenon called "Tumbling" is observed in which kind of flagella?
A) Monotrichous B) Amphitrichous
C) Sub polar D) Peritrichous

32. The genera "*Erwina*" belongs to which order?
A)Clostridiales B) Haloanaerobiales
C) Enterobacteriales D) None of the above

33. The bacterial pathogen which enter the host through lenticels?
A) *Xanthomonasoryzae*B) *Streptomyces scabies*
C) *Clavibactertritici* D) *Erwinia spp.*

34. Bacteria which uses inorganic carbon as a source of energy?
A) Phototroph B) Heterotroph
C) Photoorganotroph D) Lithotrophs

35. Plasmid responsible for bacteriocin production?
A) F -Plasmids B) col-plasmid
C) Penicillinase D) Cryptic-plasmid

36. Secretion system for which direct contact of bacterium to host cell?
A) Type I Secretion system B) Type II Secretion system
C) Type III Secretion System D) Type IV Secretion system

37. Invirion assembly which structural unit is assembled first?
A) Head B) Tail
C) Collar D) Base Plate

38. The outermost covering of endospore is called?
A) Spore coat B) Outer membrane
C) Exosporium D) none of the above

39. Dipicolinic acid and Ca+ ion which attribute heat resistance in endospore is present in?
A) Spore coat B) Outer membrane
C) Exosporium D) Sporecore

40. Which murein subunits is present maximum in cortex of endospore?
A) NAM B) NAG
C) NAM & NAG D) none of the above

41. Which of the following bacterial diseases enters the plants through hydathodes
A. Xanthomonascampestrispvoryzicola
B. Erwiniaamylovora
C. Streptomyces scabies
D. Xanthomonasoryzaepvoryzae

42. Which of the following bacterial diseases enters the plants through necterthodes
A. *Xanthomonascampestris*pv*oryzicola*
B. *Erwiniaamylovora*
C. *Streptomyces scabies*
D. *Xanthomonasoryzae*pv*oryzae*

43. Which of the following bacterial diseases enters the plants through stomata
A. *Xanthomonascampestris*pv*oryzicola*
B. *Erwiniaamylovora*
C. *Streptomyces scabies*
D. *Xanthomonasoryzae*pv*oryzae*

44. Vascular wilt of cucurbits caused by Erwiniatracheiphila enters into cucurbits through wounds created by
A. *Chaetonemapulicaria* *B.* *C. denticulate*
C. *Diabroticavittata* D. None of the above

45. *Erwiniaamylovora* is transmitted by
A. Leaf miner B. Bees and wasps
C. Flee beetle D. Fruit fly

46. *Xanthomonascitri* is transmitted by
A. Leaf miner B. Bees and wasps
C. Flee beetle D. Fruit fly

47. Which of the following bacterial disease is seed transmitted

A. *X. campestrispvmalvacearum* B. *X. citri*

C. *Erwiniaamylovora* D. *X. oryzaepvoryzae*

48. Example of transient visitors

A. *X. campestrispvcampestris* B. *Pantoea*

C. *Erwinia* D. *Bacillus*

49. Bacterial ooze comes out of stomata in the morning hours and lesions remain restricted in rows by veins is a symptom of

A. Leaf speck B. Wilt

C. Leaf streak D. Gummosis

50. Older leaves near ground levels show V-shaped water soaked lesions appear from margin to inward later turn yellow and gradually becomes necrotic and dry is a symptom of

A. Scab B. Black rot or black vein

C. Canker D. Blotch

51. Orange red discolouration of the vascular bundle containing water conducting tissues (xylem) at the basal nodes of the stalk is a symptom of

A. Ratoon stunting of sugarcane B. Gummosis of cherris

C. Bacterial fruit blotch D. Bacterial canker

52. Which of the following diseases survives in soil

A. *Ralstonia* B. *X campestris*pv*malvacearum*

C. *X campestris*pv*campestris* D. *Pantoeastewartii*

53. Parasitic activity of Trichodermaviride was first reported by Weindling in 1932 against

A. *Ralstoniasolanacearum* B. *Rhizoctoniasolani*

C. *Xanthomonasoryzaepvoryzae* D. *Botrytis cineraria*

54. Plasmid of which of the following produces bacteriocinAgrocin 84

A. A. radiobacter B. A. tumefaciens

C. B. subtilis D. Pseudomonas

55. Flooding of fields is to control

A. Fusarium wilt B. Leaf spot

C. Scab D. Blotch

56. Bacterial blight of pea is transmitted by

A. Aerosols B. Sprinkler irrigation

C. Aerial strands D. Both b & c

57. Bacterial blight of mulberry caused by *P.syringae*pv*mori* is transmitted by

A. Aerosols B. Sprinkler irrigation

C. Aerial strands D. Both b & c

58. Plant pathogenic bacterial genera Erwinia was established by
A. Migula,1894 B. Dowson, 1939
C. Davis et al., 1984 D. Winslow et al., 1917

59. Plant pathogenic bacterial genera *Pseudomonas* was established by
A. Migula,1894 B. Dowson, 1939
C. Davis et al., 1984 D. Winslow et al., 1917

60. Plant pathogenic bacterial genera *Xanthomonas* was established by
A. Migula,1894 B. Dowson, 1939
C. Davis et al., 1984 D. Winslow et al., 1917

61. Plant pathogenic bacterial genera *Clavibacter*was established by
A. Migula,1894 B. Dowson, 1939
C. Davis et al., 1984 D. Winslow et al., 1917

62. Bacterial blight of cotton was first reported in
A. India B. USA
C. Hawaii D. Brazil

63. Bacterial blight of cotton was first reported in India in the state of
A. Karnataka B. Tamil Nadu
C. Kerala D. Andhra Pradesh

64. Citrus canker first originated in which country
A. India B. USA
C. Hawaii D. Brazil

65. Bacterial blight of rice is caused by
A. X. oryzaepvoryzae *B. X. oryzaepvoryzicola*
C. X. campestrispvcampestris *D. X. citri*

66. Corn flee beetle transmits
A. Xanthomonascitri *B. Erwiniaamylovora*
C. Pantoeastewartii *D. Clavibactertritici*

67. Bacterial blight of soybean is transmitted by
A. Rainsplashes *B. Aerosol*
C. Irrigation *D. Nematode*

68. Bcterialetiology of a plant disease was first reported by,
A. Robert koch B. Woronin
C. T.J.Burril D. E.F Smith

69. First bacterial plant pathogen, which was sequenced by A.J. Simpson was
A. Xylellafastidiosa
B. Haemophilus influenza
C. Ralstoniasolanacearum
*D. Xanthomonasaxonopodis*pv. *citri*

70. The technique of gram staining was developed in the year
A. 1885 B. 1884
C. 1887 D. 1889

71. Phytopathogenic bacteria are
A. Mostly gram negative B. Noncapsulated
C. Non- spore former D. All of the above
72. The cytoplasmic membrane of bacteria contains
A. 50% protein,25% lipids, 25% carbohydrates
B. 75 % protein, 50% lipids , 25% carbohydrates
C. 25% protein, 50% lipids, 25% carbohydrates
D. None of the above
73. The cell wall of bacteria consists of
A. Cellulose B. Chitin
C. Murein D. â- glucan
74. The site of respiration in bacteria is
A. Mesosomes B. Ribosomes
C. Plasmid D. All of the above
75. Bacterium with several flagella at one polae end is called
A. Monotrichous B. Amphitrichous
C. Cephalotrichous D. Lophotrichous
76. Flagellin is an incomplete protein containing
A. 14 amino acids B. 15 amino acids
C. 16 amino acids D. 17 amino acids
77. The flagellar antigen is called
A. F antigen B. H antigen
C. B antigen D. L antigen
78. Aerotaxis is the movement of bacteria in response to the
A. Molecular oxygen as stimuli B. Water as stimuli
C. Light D. None of the above
79. *Xanthomonasoryzae*pv. *oryzae* enters the host through
A. Hydathodes B. Trichomes
C. Root hairs D. Lenticels
80. Corn flee beetle is a carrier of
A. *Pseudomonas syringae*pv. *glycinea* *B.* *Erwiniaamylovora*
C. *Pantoeastewartii* *D.* *Pseudomonas avenae*
81. Ralstoniasolanacearum survives in
A. Soil B. Seed
C. Weeds D. Insect vector
82. Bacteria which uses inorganic compounds as source of energy is called
A. Phototrophs B. Lithotrophs
C. Chemoautotrophs D. Photoorganotroph
83. Bacteria which flourish at moderate temperature
A. Psychrophiles B. Mesophiles
C. Thermophiles D. None of the above

84. Organisms that do not require O2 for growth and are inhibited are called
A. Obligate aerobes B. Facultative aerobecs
C. Obligate anaerobes D. Facultative anaerobes
85. The term plasmid was coined by
A. Lederberg B. H.Stolp
C. E.F. Smith D. None of the above
86. Bdellovibrio parasitizes
A. Virus B. Fungi
C. Bacteria D. Phytoplasma
87. tra- genes containing plasmid is called
A. Fertility plasmid B. Col-plasmid
C. Cryptic plasmid D. Virulence plasmid
88. Photosynthetic bacteria contain chlorophyll in –
A. Cytoplasm B. thylakoid membrane
C. Both a and b D. None of the above
89. Archaebacteria contains ———— in their cell wall
A. Polysaccharide B. Pseudopeptidoglycan
C. Protein D. All the above
90. Size of a bacteria
A. 0.2-1.5µmX3.0-5.0µm B. 0.5-2.0µmX3.0-5.0µm
C. 0.1-1µmX1-2µm D. 0.5-1.0µmX1.0-2.0 µm
91. Polar head of phospholipids present in cytoplasmic membrane of bacteria are pointed towards——— side of surface
A. Outer B. Inner
C. Middle D. None of the above
92. Site of oxidative phosphorylation in prokaryotes is –
a. Cytoplasmic membrane c. mitochondria
b. Golgi bodies d. ribozyme
93. Bacterial DNA is ———— type
a. Closed
b. circularc.covalentd.all the above
94. Filament in bactertial flagella constitutes of –
a. Nonproteinaceous core c. proteinaceoussubfibrils
b. Flagellind.all the above
95. Tumbling is seen in case of ———— flagellation
a.lophotrichous c. monotrichous
b. peritrichous d. none of the above
96. Mode of action of penicillin-
a. Murein breakage c. Binding to 50S ribozyme
b. Affects 30S ribozyme d. Inhibits RNA polymerase enzyme

97. Tetracyclines inhibits binding of –
   a. Aminoacyltransferase to 30S ribozyme
   b. Inhibits binding of RNA Polymerase to cell
   c. Aminoacyltransferase to 50S ribozyme
   d. None of the above

98. The number of ring present in gram positive bacterial flagella is/are-
   a) 1 ring b) 2 rings
   c) 3 rings d) 4 rings

99. The size of Bacteria ranges generally from-
   a) 2.5-4.2 micrometer in diameter to 3.0-5.0 micrometer in length.
   b) 0.2-1.5 micrometer in diameter to 5.5-7.2 micrometer in length.
   c) 2.5-4.2 micrometer in diameter to 5.5-7.2 micrometer in length.
   d) 0.2-1.5 micrometer in diameter to 3.0-5.0 micrometer in length.

100. In Gram negative bacteria, total number of ring present is –
   a) One b) Two
   c) Three d) Four

101. Gram negative bacterial cell wall is lacking in –
   a) Techoic acid b) Butaric acid
   c) Muramic acid d) Lipid protein

102. Gram negative Bacteria are under division –
   a) Tenericutes b) Firmicutes
   c) Mollicutes d) Gracilicutes

103. The cell wall of some bacteria is surrounded by a polysaccharide in the form of a thick definite layer, this is known as –
   a) Capsule b) Capsid
   c) Slime Layer d) Cell layer

104. In electron microphotograph, the cell wall of gram negative bacteria appears as –
   a) Homogenous layer b) Bi layered
   c) Tri partile d) Tetra layered

105. In general, gram positive bacteria contain mucopeptide of –
   a) 3-12% b) 20%
   c) 35% d) 85%

106. The budding bacterial genus is –
   a) Caulobacter b) Vibrio
   c) Rhodomicrobium d) Sarcina

107. The pilli are present in most of the –
   a) Gram positive bacteria b) Gram negative bacteria
   c) Phytoplasmas d) RLO

108. The bacterial flagella are –
   a) 40 Angstrom in diameter
   b) 60 Angstrom in diameter

c) 120-150 Angstrom in diameter
d) 90-110 Angstrom in diameter

109. The helical or spiral bacteria (Spirochaetes) move by contraction of –
a) Flagella b) Crista
c) Stalk d) Pilli

110. Cysts are formed in the bacterial genus –
a) Bacillus b) Clostridium
c) Azotobacter d) Sarcina

111. Bacteria with bunches of flagella at both end of the cell are called –
a) Peritrichous b) Amphitrichous
c) Lophotrichous d) Monotrichous

112. Ring rot(wilt)of potato is caused by –
a) Burkholderiagladicola b) Pseudomonas syringaepv. syringae
c) Ralstoniasolanacearum d) Pecobacteriumcarotovorapv.carotovora

113. Conjugation in bacteria was discovered by whom?
a) Lederburg and Tatum b) Hayes
c) Woolman d) Avery, Macleod and McCarty

114. Causal organism of Pierce's disease of grapevine?
a) Clavibacterxyli b) Xylellafastidiosa
c) Rathayibactertritici d) Pectobacteriumcarotovorapv.atroseptica

115. Plasmid which can be transferred from one bacterial cell to another by a conjugative process are called as
a) F – factor b) R – factor
c) Alternate plasmid d) None of the above

116. The transfer of a naked fragment of DNA between bacteria is called
a) Conjugation b) Transformation
c) Transduction d) none of the above

117. Which of the following bacteriophages has a lysogenic life cycle?
a) Lambda b) T3
c) T7 d) Coliphasefd

118. The flagella having lateral filaments perpendicular to the main axis are termed as
a) Whiplash flagella b) tinsel flagella
c) Feathery flagella d) Locomotary flagella

119. MLO and Spiroplasma are mostly
a) Xylem inhibiting b) Phloem inhibiting
c) Both (a) & (b) d) Stomata inhibiting

120. The bacterial cell wall is made up of
a) Chitin b) Mucopeptide
c) fatty acid d) Cellulose

121. N-Acetyglucosaminoacid and N-acetyl muramic acid in the peptidoglycan unit is linked by

a) â 1, 4-glycosidic bond b) Interpeptide linkage
c) Phosphate bond d) S-H bond

122. Bergeys manual of determinative bacteriology is published in

a) 4 volumes b) 11 sections
c) 2 volumes d) 3 volumes

123. Which one is a host specific toxin

a) tabtoxin b) fusaric acid
c) Pyricularin d) victorin

124. The vegetative stages of most types of bacteria reproduce by

a) Fission b) Segmentation
c) Spore formation d) None of the above

125. Bacteriophage is actually a

a) Virus b) Bacteria
c) Bdellovibrio d) None of the above

126. *Erwiniaamylovora* bacteria causing fire blight of Apple and Pear is also transmitted by

a) Ants b) Flies
c) Bees d) All of the above

127. The number of chromosomes present in bacteria is :

a) 1 b) >1
c) <1 d) 2

128.The spherical bacterium is known as

a) Bacillus b) Coccus
c) Spirillum d) Vibrio

129. The elicitors of Erwiniaamylovora is

a) Harpin b) PopA1
c) Harpins d) Both A & C

130. Wart disease of patato caused by *Synchytriumendobioticum*

a) Endemic b) Epidemic
c) Pandemic c) Sporadic

131.Who is regarded as father of plant bacteriology in India

A. M. K. Mitra B. E.J. Butler
C. K.C. Mehta D. B.B. Mundkur

132. Who first discovered bacteria?

A. Antonie van Leeuwenhoek B. Louis Pasteur
C. E. F. Smith D. Robert Koch

133. Angular leaf spot or Black arm of cotton is caused by

A. *Xanthomonas* B. *Pseudomonas*

C. *Erwinia* D. *Clavibacter*

134. Flagella are present on all sides of the cell is called-
A. Peritrichous B. Monotrichus
C. Amphitrichus D. Lophotrichus

135. Which one of the following genera causes most of the wilt diseases in Vegetables?
A. *Agrobacterium* B. *Ralstonia*
C. *Xanthomonas* D. None of the above

136. The Bacterium causing citrus canker enters the plants through
A. Stomata B. Hydathode
C. Lenticel D. Natural opening or Wounds

137. Which one of the following cannot be cultured in vitro?
A. Plant Pathogenic Bacteria B. Spiroplasma
C. Fungi D. Phytoplasma

138. F plasmid is transmitted from one bacterial cell to another through
A. Transformation B. Conjugation
C. Transduction D. All of the above

139. Pili present in bacteria help in
A. Transformation B. Conjugation
C. Transduction D. All of the above

140. In which year first bacterial disease "Fire Blight" was described by T. J Burrill
A. 1888 B. 1885
C. 1882 D. 1878

141. The endospores forming bacterial genus is
A. *Pseudomonas* B. *Bacillus*
C. *Erwinia* D. *Rhizobium*

142. The size of the flagellin molecule is-
A. 10 Å in diameter B. 30 Å in diameter
C. 40 Å in diameter D. 80 Å in diameter

143. The stalked bacterial genus is-
A. *Bacillus* B. *Sarcina*
C. *Spirillum* D. *Caulobacter*

144. Mucopeptide is a polymer made up of alternating units of-
A. NAG and NAM B. Manose and Galactose
C. Glucose and Galactose D. Mucopeptide

145. The symbiont bacterial genus is-
A. *Rhizobium* B. *Pseudomonas*
C. *Erwinia* D. *Bacillus*

146. Chemically capsule and slime layer are made up of-
A. Proteins molecules B. Fat

C. Polysaccharide of Glucose D. Essential amino acids

147. In general gram positive bacteria contain mucopeptide of-
A. 3-12% B. 20%
C. 35% D. 85%

148. In general gram negative bacteria contain mucopeptide of-
A. 3-12% B. 20%
C. 35% D. 85%

149. Bacterial flagella are lacking of-
A. Protein B. Mucopeptide
C. 9+ 2 Structure D. Filament

150. The cell wall of bacteria contains
A. Peptidoglycan B. Chitin
C. Cellulose D. All of these

151. Pseudomurein is present in-
A. Bacteria B. Archaeabacteria
C. Fungi D. Algae

152. Histone proteins are present in-
A. Bacteria B. Archaea
C. Eukaryote D. None

153. Who is regarded as the father of bacteriological techniques?
A. Robert Koch B. E F Smith
C. T J Burril D. M S Woronin

154. Who is the founder of phytobacterilogy in India?
A. M K Patel B. M K Hingorani
C. E J Butler D. E F Smith

155. What is the shape of the bacteria *Hyphomicrobium* ?
A. Bifidoform B. Star shaped
C. Bat shaped D. Fusiform

156. Plant pathogenic bacteria are mostly-
A. Gram negative in reaction B. Non capsulated
C. Non-spore former D. All of these

157. Which of the following protein is present in flagella?
A. Pilin B. Flagellin
C. Prolin D. None

158. In case of Gram positive bacteria, the cytoplasmic membrane contains-
A. Lipoteichoic acid B. Glycolipid
C. Phosphatidyl glycolipid D. All of these

159. Murein, unique to bacterial cell wall is composed of-
A. N-acetyle glucosamine B. N-acetyl muramic acid
C. Both a) and b) D. None

160. Xanthomonas is a type of bacteria-

A. Monotrichous B. Amphitrichous

C. Lophotrichous D. Peritrichous

161. Select the bacteria that have peritrichous type of flagella

A. *Erwinia* B. *Xanthomonas*

C. *Spirillum* D. *Agrobacterium*

162. Select the rings present in the basal body of gram negative bacteria

A. L and P B. S and M

C. L, P, S and M D. None

163. The mode of entry of *Xanthomonasoryzae*pv. *oryzae* into the host cell -

A. Stomata B. Lenticels

C. Hydathodes D. Both A and C

164. The mode of survival of *Pantoeastewartii* is–

A. Corn flee beetle B. Crop debris

C. Seed D. Soil

165. Which of the following instrument is used to measure the growth of bacteria?

A. Anemometer B. Barometer

C. Haemocytometer D. Calorimeter

166. In which phase of bacterial growth curve, growth rate is equal to the death rate

A. Lag phase B. Log phase

C. Stationary phase D. Death phase

167. Penicillinase plasmid imparts resistance to penicillin, present in which of the following bacteria?

A. *Agrobacterium tumefaciens* B. *Xanthomonasoryzae*

C. *Staphylococcus aureus* D. *Erwiniaamylovora*

168. Select the following viruses that produces exospores:

A. *Rhodomicrobium* B. *Methylococcus*

C. *Methylobacter* D. All of these

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CHAPTER 5
BASIC BACTERIOLOGY

1. (Ans: C, Fire blight of Apple Source: Modern Plant Pathology by H.C. Dube, Page: 46)
2. (Ans: A, 1 Source: Plant Bacteriology by K.K. Mondal, Page: 2)
3. (Ans: D, All of the above Source: Plant Bacteriology by K.K. Mondal, Page: 31)
4. (Ans: B, 2000 Source: Modern Plant Pathology by H.C Dube, Page: 48)
5. (Ans: B, Louis Pasteur Source: Fundamentals of Plant Bacteriology by Jayashree Jayaraman and Jeevan Prakash Verma, Page: 8
6. (Ans: D, 1676 Source: A text book of Fungi, Bacteria and Viruses by H.C. Dube, Page: 162)
7. (Ans: B, Coccus Source: A text book of Fungi, Bacteria and Viruses by H.C. Dube, Page: 163)
8. (Ans: A, Capsule Source: A text book of Fungi, Bacteria and Viruses by H.C. Dube, Page: 167)
9. (Ans: C, Both a and b Source: Fundamentals of Plant Bacteriology by Jayashree Jayaraman and Jeevan Prakash Verma, Page: 90)
10. (Ans: B, PoP A1 Source: Fundamentals of Plant Bacteriology by Jayashree Jayaraman and Jeevan Prakash Verma, Page: 104)
11. (Ans: A, Harpin Source: Fundamentals of Plant Bacteriology by Jayashree Jayaraman and Jeevan Prakash Verma, Page: 104)
12. (Ans: C, harpins Source: Fundamentals of Plant Bacteriology by Jayashree Jayaraman and Jeevan Prakash Verma, Page: 104)
13. (Ans: C, both a and b Source: Fundamentals of Plant Bacteriology by Jayashree Jayaraman and Jeevan Prakash Verma, Page: 106)
14. (Ans: A, auxotrophic Source: Fundamentals of Plant Bacteriology by Jayashree Jayaraman and Jeevan Prakash Verma, Page: 45)
15. (Ans: A: burkholderiaceae Source: Modern Plant Pathology by H.C Dube, Page: 49)
16. (Ans: A, 1923 Source: Modern Plant Pathology by H.C Dube, Page: 47)
17. (Ans: D, both a and b Source: A text book of Fungi, Bacteria and Viruses by H.C. Dube, Page: 166)
18. (Ans: D, Alexander fleming Source: A text book of Fungi, Bacteria and Viruses by H.C. Dube, Page: 175)
19. (Ans: A, david H Bergey Source: A text book of Fungi, Bacteria and Viruses by H.C. Dube, Page: 187)

20. (Ans: A, X axonopodis pv malvacearum Source: Plant Bacteriology by K.K. Mondal, Page: 78)
21. Ans C, Protein (Plant Bacteriology by K K Mondal; Page 44)
22. Ans B, 2-4nm (Plant Bacteriology by K K Mondal; Page 45)
23. Ans B, 20-25% (Plant Bacteriology by K KMondal; Page 46)
24. Ans B, ssRNA (Plant Bacteriology by K KMondal; Page 88)
25. Ans B, 2 (Plant Bacteriology by K K Mondal; Page 46)
26. Ans B, Mesosomes (Plant Bacteriology by K K Mondal; Page 49)
27. Ans B, Clostridium (Plant Bacteriology by K K Mondal; Page 51)
28. Ans C, Sub polar (Plant Bacteriology by K K Mondal; Page 55)
29. Ans A, Enterobacterioceae (Plant Bacteriology by K K Mondal; Page 56)
30. Ans C, S Ring (Plant Bacteriology by K K Mondal; Page 56)
31. Ans D, Peritrichous flagella (Plant Bacteriology by K K Mondal; Page 56)
32. Ans C, Enterobacteriales (Plant Bacteriology by K K Mondal; Page 65)
33. Ans B, *Streptomyces scabies* (Plant Bacteriology by K K Mondal; Page 71)
34. Ans D, Lithotrophs (Plant Bacteriology by K K Mondal; Page 83)
35. Ans B, col-plasmid (Plant Bacteriology by K K Mondal; Page 88)
36. Ans C, Type III Secretion System (Plant Bacteriology by K K Mondal; Page 97)
37. Ans D, Base Plate (Plant Bacteriology by K K Mondal; Page 107)
38. Ans C, Exosporium (Plant Bacteriology by K K Mondal; Page 111)
39. Ans D, Sporecore (Plant Bacteriology by K KMondal; Page 112)
40. Ans A, NAM (Plant Bacteriology by K KMondal; Page 112)
41. Ans : D Xoo (Plant bacteriology by KK Mondal, Page : 71)
42. Ans : B Erwinia amylovora (Plant bacteriology by KK Mondal, Page : 71)
43. Ans : A X. Campestris pv. oryzicola (Plant bacteriology by KK Mondal, Page : 71)
44. Ans: C Diabrotica vittata (Plant bacteriology by KK Mondal, Page : 71)
45. Ans: B Bees and wasps (Plant bacteriology by KK Mondal, Page : 73)
46. Ans: A Leaf miner (Plant bacteriology by KK Mondal, Page : 73)
47. Ans: A Xcm (Plant bacteriology by KK Mondal, Page : 73)
48. Ans: A X campestris pv. campestris (Plant bacteriology by KK Mondal, Page : 72)
49. Ans: C Leaf Streak (Plant bacteriology by KK Mondal, Page :37)
50. Ans: B black rot/black vein (Plant bacteriology by KK Mondal, Page :38)
51. Ans: A ratoon stunting of sugarcane (Plant bacteriology by KK Mondal, Page :40)
52. Ans: A Ralstonia (Plant bacteriology by KK Mondal, Page :77)
53. Ans: B Rhizoctonia solani (Principles of plant pathology, Page: 330)
54. Ans: A A. radiobacter (Principles of plant pathology, Page: 332)
55. Ans: A Fusarium wilt (Modern plant pathology, pg 155)
56. Ans: D Both b and c (Plant bacteriology by KK Mondal, Page :78)
57. Ans: C Aerial strands (Plant bacteriology by KK Mondal, Page :78)

58. Ans: D Winslow,1917 (The Bacteria by JP Verma, page: 207)
59. Ans: A Migula,1894 (The Bacteria by JP Verma, page: 207)
60. Ans: B Dowson,1939 (The Bacteria by JP Verma, page: 207)
61. Ans: B Dowson 1939 (The Bacteria by JP Verma, page: 207)
62. Ans: B USA (The Bacteria by JP Verma, page: 220)
63. Ans: B Tamil Nadu (The Bacteria by JP Verma, page: 220)
64. Ans: A India (The Bacteria by JP Verma, page: 228)
65. Ans: A Xoo (Plant bacteriology by KK Mondal, Page :73)
66. Ans: C Pantoea stewartii (Plant bacteriology by KK Mondal, Page: 73)
67. Ans: B Aerosol (Plant bacteriology by KK Mondal, Page: 73)
68. Ans: C Burill (Source: Plant Bacteriology, pg: 5)
69. Ans: A Xylella fastidiosa (Source : Plant Bacteriology, pg : 13)
70. Ans: B 1884 (Source : Plant Bacteriology, pg : 16)
71. Ans: D All the above (Source: Plant Bacteriology, pg: 32)
72. Ans: A 50 p,25 l, 25 c (Source : Plant Bacteriology, pg : 45)
73. Ans: C Murein (Source : Plant Bacteriology, pg : 46)
74. Ans: A mesosomes (Source : Plant Bacteriology, pg : 48)
75. Ans: C Cephalotrichous (Source : Plant Bacteriology, pg : 56)
76. Ans: A 14 amino acid (Source: Plant Bacteriology, pg : 56)
77. Ans: B H antigen (Source : Plant Bacteriology, pg : 56)
78. Ans: A molecular O as stimuli (Source : Plant Bacteriology, pg : 58)
79. Ans: A Hydathodes (Source : Plant Bacteriology, pg : 71)
80. Ans: C Pantoea stewartii (Source : Plant Bacteriology, pg : 75)
81. Ans: A soil (Source : Plant Bacteriology, pg : 77)
82. Ans: B lithotrophs (Source : Plant Bacteriology, pg : 83)
83. Ans: B mesophiles (Source : Plant Bacteriology, pg : 83)
84. Ans: C obligate anaerobes (Source : Plant Bacteriology, pg : 83)
85. Ans: A Lederberg (Source : Plant Bacteriology, pg : 87)
86. Ans: C bacteria (Source : Plant Bacteriology, pg : 103)
87. Ans: A fertility (Source : Plant Bacteriology, pg : 88) Fertility
88. Ans: C both a and b (Plant Bacteriology -KK Mondal , Chp 1, Introduction, Pg. No. 1)
89. Ans – D all the above (Plant Bacteriology -KK Mondal , Chp 1, Introduction, Pg. No. 1)
90. Ans- A 0.2-1.5µmX3.0-5.0µm
(Plant Bacteriology -KK Mondal , Chp 1, Introduction, Pg. No. 3)
91. Ans – A outer (Plant Bacteriology -KK Mondal , Chp 6, Structure of bacteria, Pg. No. 45)
92. Ans – A cytoplasmic membrane (Plant Bacteriology -KK Mondal , Chp 6, Structure of bacteria, Pg. No. 45)

93. Ans – D All of the above (Plant Bacteriology -KK Mondal , Chp 6, Structure of bacteria, Pg. No. 2)
94. Ans – D All of the above (Plant Bacteriology -KK Mondal , Chp 7, Flagellar arrangement,structure and movement in bacteria, Pg. No. 56)
95. Ans – B peritrichous (Plant Bacteriology -KK Mondal , Chp 7, Flagellar arrangement,structure and movement in bacteria, Pg. No. 57)
96. Ans – A murein breakage (Plant Bacteriology -KK Mondal , Chp 11, Antibiotics and their mode of action, Pg. No. 84)
97. Ans - A Aminoacetyl transferase to 30S ribozyme
(Plant Bacteriology -KK Mondal , Chp 11, Antibiotics and their mode of action, Pg. No. 85)
98. (Ans: b, 2 Source: Book: Kalyan K. Mondal, Plant Bacteriology, Page: 46)
99. (Ans : d, 0.2-1.5,3-5
Source: Book : Kalyan K. Mondal, Plant Bacteriology, Page: 3)
100. (Ans : d, 4 Source: Book : Kalyan K. Mondal, Plant Bacteriology, Page: 46)
101. (Ans: a, techoic acid Source: Book: Kalyan K. Mondal, Plant Bacteriology, Page: 46)
102. (Ans: d, gracilicutes Source: Book: HC, Dube, A Textbook of Fungi, Bacteria and Viruses, Page: 186)
103. (Ans: a, capsule Source: Book: Kalyan .K.Mondal, Plant Bacteriology, Page : 48)
104. (Ans: c, 3-layered Source: Book: HC, Dube, A Textbook of Fungi, Bacteria and Viruses, Page: 174)
105. (Ans: d, 85 Source: Book : HC, Dube, A Textbook of Fungi, Bacteria and Viruses, Page: 174)
106. (Ans: c, Rhadomicrobium Source: Book: HC, Dube, A Textbook of Fungi, Bacteria and Viruses, Page: 165)
107. (Ans: b, G-ve bacteria Source: Book: H.C.Dube, A textbook of Fungi, Bacteria and Viruses, page :170)
108. (Ans: c, Dubey,1968 Source: Book: Kalyan.K.Mondal, Plant Bacteriology)
109. (Ans: b, crista Source: Book: HC Dube, A textbook of Fungi, Bacteria and Viruses, Page: 166)
110. (Ans: c, azotobacter Source: Book: HC Dube, A textbook of Fungi, Bacteria and Viruses, Page: 166)
111. (Ans: c, amphitrichous Source: Book : HC Dube, A textbook of Fungi, Bacteria and Viruses, Page: 169)
112. (Ans: c, R. solanacearum Source: Book: HC Dube, A textbook of Fungi, Bacteria and Viruses, Page: 217)
113. (Ans: a, lederburg and tatum Source: Book: HC Dube, A textbook of Fungi, Bacteria and Viruses, Page: 205)

114. (Ans: b, xylella fastidiosa Source: Book: HC Dube, A textbook of Fungi, Bacteria and Viruses, Page: 218)
115. (Ans: A, F Factor Source: Fungi bacteria and virus- H.C. Dube, Page no: 208)
116. (Ans: B, transformation Source: Fungi bacteria and virus- H.C. Dube, Page no: 201)
117. (Ans: A, lamda Source: Fungi bacteria and virus- H.C. Dube, Page no: 213)
118. (Ans: B, tinsel flagella Source: Fungi bacteria and virus- H.C. Dube, Page no: 170)
119. (Ans: B, phloem Source: principles of plant pathology-R.S. Singh, Page no: 25)
120. (Ans: B, mucopeptide Source: Fungi bacteria and virus- H.C. Dube, Page no: 167)
121. (Ans: A, B 1,4 Glucosidic linkage Source: Fungi bacteria and virus- H.C. Dube, Page no: 172)
122. (Ans: A, K.K. Mondal Source: Fungi bacteria and virus- H.C. Dube, Page no: 187)
123. (Ans: D, victorin Source: principles of plant pathology, Page no: 154)
124. (Ans: A, Fission Source: Fungi bacteria and virus- H.C. Dube, Page no: 196)
125. (Ans: A, virus Source: Fungi bacteria and virus- H.C. Dube, Page no: 229)
126. (Ans: d, bees Source: principles of plant pathology-R.S. Singh, Page no: 78)
127. (Ans: A, 1 Source: Plant Bacteriology by K.K Mondal, Page no: 2)
128. (Ans: B, coccus Source: A text book on Fungal, Bacteria and viruses- H.C Dube, Page no: 163)
129. (Ans: A, harpin Source: fundamentals of Plant bacteriology by Jayashree and Jayaraman and J.P. Verma, Page no: 104)
130. (Ans: A, edndemic Source: principles of plant pathology-R.S. Singh, Page no: 40)
131. (Ans: A, MK Mitra Source: Fundamentals of Plant Pathology, D. Alice, C. Jeyalakshmi, Page:13)
132. (Ans: A, A.V. Luewonhoek Source: Fundamentals of Plant Bacteriology, Jayashree Jayaraman and J.P Verma, Page: 3)
133. (Ans: A, Xanthomonas Source: Fundamentals of Plant Bacteriology, Jayashree Jayaraman and J.P Verma, Page: 18)
134. (Ans: A, Peritrichous Source: Fundamentals of Plant Bacteriology, Jayashree Jayaraman and J.P Verma, Page: 63)
135. (Ans: B, Ralstonia Source: Fundamentals of Plant Bacteriology, Jayashree Jayaraman and J.P Verma, Page: 59)
136. (Ans: D, Natural openings Source: Fundamentals of Plant Bacteriology, Jayashree Jayaraman and J.P Verma, Page: 32)
137. (Ans: D, phytoplasma Source: Fundamentals of Plant Bacteriology, Jayashree Jayaraman and J.P Verma, Page: 53)
138. (Ans: B, conjugation Source: Fungi, Bacteria and viruses, H. C. Dube, Page: 208)
139. (Ans: B, conjugation Source: Fungi, Bacteria and viruses, H. C. Dube, Page: 207)
140. (Ans: D, 1878 Source: Fungi, Bacteria and viruses, H. C. Dube, Page: 217)
141. (Ans: B, Bacillus Source: Fungi, Bacteria and viruses, H. C. Dube, Page: 182)
142. (Ans: C, 40A Source: Fungi, Bacteria and viruses, H. C. Dube, Page: 168)
143. (Ans: D, Caulobacter Source: Fungi, Bacteria and viruses, H. C. Dube, Page: 182)

144. (Ans: D, NAG and NAM Source: Fungi, Bacteria and viruses, H. C. Dube, Page: 172)
145. (Ans: A, Rhizobium Source: Fungi, Bacteria and viruses, H. C. Dube, Page: 162)
146. (Ans: C, polysaccharide Source: Fungi, Bacteria and viruses, H. C. Dube, Page: 171)
147. (Ans: D, 85 Source: Fungi, Bacteria and viruses, H. C. Dube, Page: 172)
148. (Ans: A, 3-12 Source: Fungi, Bacteria and viruses, H. C. Dube, Page: 172)
149. (Ans: C, (9+2) Source: Fungi, Bacteria and viruses, H. C. Dube, Page: 168)
150. (Ans: A, peptidoglycan Sources: K K Mondal, Plant Bacteriology, Page no: 45)
151. (Ans: B, archaebacteria Sources: K K Mondal, Plant Bacteriology, Page no: 2)
152. (Ans: B, archaebacteria Sources: K K Mondal, Plant Bacteriology, Page no: 2)
153. (Ans: A, Robert Koch Sources: K K Mondal, Plant Bacteriology, Page no: 5)
154. (Ans: A, MK Patel Sources: K K Mondal, Plant Bacteriology, Page no: 6)
155. (Ans: C, bat shaped Sources: K K Mondal, Plant Bacteriology, Page no: 32)
156. (Ans: D, all of these Sources: K K Mondal, Plant Bacteriology, Page no: 32)
157. (Ans: B, flagellin Sources: K K Mondal, Plant Bacteriology, Page no: 44)
158. (Ans: D, all of these Sources: K K Mondal, Plant Bacteriology, Page no: 45)
159. (Ans: C, both b and c Sources: K K Mondal, Plant Bacteriology, Page no: 46)
160. (Ans: A, monotrichous Sources: K K Mondal, Plant Bacteriology, Page no: 55)
161. (Ans: A, erwinia Sources: K K Mondal, Plant Bacteriology, Page no: 55)
162. (Ans: C, L,P,S and M Sources: K K Mondal, Plant Bacteriology, Page no: 57)
163. (Ans: D, Both a and c Sources: K K Mondal, Plant Bacteriology, Page no: 71)
164. (Ans: A, corn flea bettle Sources: K K Mondal, Plant Bacteriology, Page no: 77)
165. (Ans: C, haemocytometer Sources: K K Mondal, Plant Bacteriology, Page no: 79)
166. (Ans: C, stationary phase Sources: K K Mondal, Plant Bacteriology, Page no: 81)
167. (Ans: C, staphylococcus aureus Sources: K K Mondal, Plant Bacteriology, Page no: 88)
168. (Ans: D, all of these Source: K K Mondal, Plant Bacteriology, Page no: 110)

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CHAPTER 6
PLANT VIROLOGY

1. Which of the following does not belong to Closteroviridae
   A) Closterovirus B) Bymovirus
   C) Ampelovirus D) Both (A) and (C)
2. Which of the following is true about Tomato leaf curl virus?
   A) It is transmitted by whiteflies B) It is a single-stranded DNA virus
   C) It has a bipartite genome D) All of the above
3. Which of the following does not belong to Rhabdoviridae
   A) Cytorhabdo virus B) Nucleorhabdo virus
   C) Fiji virus D) Both (A) and (B)
4. Which one of the following is true about Cauliflower mosaic virus?
   A) It is a double stranded DNA B) Its genome is a isometric particle
   C) Both (A) and (B) D) None of the above
5. Latent period is present in
   A) Non persistent B) Persistent
   C) Semi-persisatent D) Both (A) and (C)
6. Retention of virus through moulting is present in
   A) Non persistent B) Semi-persistent
   C) Persistent D) Both (a) and (b)
7. Which of the following is persistent virus?
   A) Potato leaf roll virus B) Citrus tristeza virus
   C) Soybean mosaic virus D) Both (a) and (b)
8. Who is the Father of Virology?
   A) Adolf Mayer B) M.W Beijerinck
   C) T.O Deiner D) W.M Stanley
9. Electron Microscope was invented by
   A) M.Knoll & E. Ruska B) Dmitri Ivanowaski
   C) Adolf Mayer D) B. Kassanis
10. Who demonstrated that Tobacco Mosaic Virus is sap transmissible?
    A) M.W Beijerinck B) T.O Deiner
    C) W.M Stanley D) Adolf Mayer
11. Who demonstrated that the causal agent of tobacco mosaic could pass through bacterial filter?
    A) T.O Deiner B) W.M Stanley
    C) Adolf Mayer D) Dimitri Ivanowski

12. Who proved that viruses can be crystalized?
    A) T.O Deiner B) W.M Stanley
    C) Adolf Mayer D) Dimitri Ivanowski
13. Satellite virus was discovered by
    A) M.Knoll & E. Ruska B) Dmitri Ivanowaski
    C) Adolf Mayer D) B. Kassanis
14. Virus can be inactivated by
    A) Heat B) Antibiotics
    C) Insecticides D) All of the above
15. The complete virus particle is known as
    A) Viroid B) Virusoid
    C) Virion D) Nucleoprotein
16. Virus groups having a single molecular species is referred to as
    A) Unipartite B) Monopartite
    C) Nanopartite D) Unopartite
17. Which of the following is/are ssDNA virus?
    A) Maize Streak virus B) Tomato leaf curl virus
    C) Banana bunchy top virus D) All of the above
18. Which of the following is/are dsRNA virus?
    A) Wound tumor virus B) Rice dwarf virus
    C) Rice ragged stunt virus D) All of the above
19. Which of the following is/are dsDNA virus?
    A) Cauliflower mosaic virus B) Dahlia mosaic virus
    C) Rice tungro bacilliform virus D) All of the above
20. Which of the following is/are ss(-)negative sense RNA virus
    A) Potato yellow dwarf virus B) Tomato spotted wilt virus
    C) Rice stripe virus D) All of the above
21. How much percentage does the nucleic acid make up of the virus?
    A) 60-95% B) 45-50%
    C) 5-40% D) 1-2%
22. Higher nucleic acid percentages are found in which shape of virus?
    A) Elongated viruses B) Spherical viruses
    C) Cylindrical viruses D) Flexuous thread viruses
23. Pinwheel like inclusion bodies is induced by which group of viruses?
    A) Tobamovirus B) Closterovirus
    C) Begomovirus D) Potyvirus
24. The protein subunit of tobacco mosaic virus (TMV) consists of …….. amino acids.
    A) 100 B) 250
    C) 150 D) 158

25. Of the nearly 1000 described plant viruses, about 800 contain ……., but 50 contain …….. , ……. Contain dsDNA and about …… contain ssDNA.
A) ssRNA, dsRNA, 40, 110 B) dsRNA, ssRNA, 110, 40
C) ssRNA, dsRNA, 60, 200 D) ssRNA, dsRNA, 120, 50

26. Which protein of TMV makes up the coat protein of the virus?
A) 126K B) 183K
C) 17.6K D) 30K

27. Common types of plant symptoms caused by systemic virus infections are?
A) Mosaics B) Ring spots
C) Both a and b D) None of the above

28. Which is the only means of tree to tree spread of virus in orchards?
A) Dodder transmission B) Natural root grafts
C) Budding D) Fungal transmission

29. Stylet-borne viruses are said to be transmitted in …… manner?
A) Non-persistent B) Semi-persistent
C) Circulative D) Propagative

30. Which nematode transmits nepoviruses?
A) Longidorus B) Trichodorus
C) Xiphinema D) Both a and c

31. …… virus having 2 ssRNAs is transmitted by nematodes.
A) Barley stripe mosaic virus B) Tobacco mosaic virus
C) Tobacco rattle virus D) Potato mop top virus

32. Cowpea mosaic virus is transmitted by ……?
A) Aphids B) Nematodes
C) Pollen D) Chrysomelid beetles

33. Tospo virus is ……..?
A) Membranous circular particle B) Bacilliform particle
C) Thin flexuous multipartite D) Isometric particle

34. Maize streak virus is ……
A) (+)ssDNA B) (-)ssDNA
C) dsDNA D) (+)ssRNA

35. …….. is applied as a spray or injected into the plant which reduces viral disease symptoms directly and may even eliminate the virus in the plant.
A) Streptomycin B) Ribavirin
C) Actinomycin D) Ampicillin

36. The term …….. means ‘thread-like viruses’.
A) Bunyavirus B) Macluravirus
C) Closterovirus D) Crinivirus

37. Rice tungro spherical virus belongs to the group of ……..?
A) Corona virus B) Bymovirus
C) Rymovirus D) Waikavirus
38. Rhizomania disease of cucurbits is caused by which group of viruses?
A) Furovirus B) Macluravirus
C) Hordeivirus D) Pecluvirus
39. …… is an isometric virus having 3+ssRNAs.
A) Bromovirus B) Cucumovirus
C) Alfamovirus D) All of the above
40. Which of the following diseases are caused by viroids?
A) Citrus exocortis B) Potato spindle tuber
C) Cadang cadang D) All of the above
41. Who coined the term 'virus'?
A) Meyer B) B.Ivanovsky
C) Beijerinck D) Hashimoto
42. Who discovered that TMV contained RNA?
A) Chester B) B.Bawden
C) C.Pirie D) Both b and c
43. Who demonstrated that virus could be eradicated from an infected plant?
A) Fukushi B) Kassanis
C) Franklin D) Nixon
44. Who demonstrated transvorial transmission of Rice dwarf virus?
A) Tsugita B) Hashimoto
C) Koken D) Fukushi
45. Who discovered the full structure of virus?
A) Mukker B) Rosalind Franklin
C) W.M. Stanley D) Robley Williams
46. Who discovered satellite RNA is plant viruses?
A) Davis B) Worley
C) Kaper*et al*. D) Goodman
47. The first enzyme discovered in virus was
A) Neuraminidase B) Endopeptidase
C) NTPase D) None of the above
48. The statement " Virus is a virus" is given by,
A) Bawden B) W.M.S tanley
C) Twort D) Andre Lwoff
49. The infectious part of the virus is
A) Envelope B) Nucleoid
C) Capsid D) Spike protein

50. Total numbers of capsomeres present in the capsid of Adenovirus is
A) 251 B) 252
C) 253 D) 254
51. The term Bacteriophage was coined by
A) d' Herelle B) Safferman
C) Twort D) None of the above
52. Who proved that the nucleic acid of TMV is RNA
A) Safferman and Morris B) Fraenkel- Conrat
C) Gierer and Schramm D) None of the above
53. The weight of the nucleic acid ranges from
A) 2-5 x 106 Daltons B) 1-3 x 106 Daltons
C) 7-9x 106 Daltons D) 11-13 x 106 Daltons
54. Viruses which depend on helper virus are called
A) Sattellite virus B) TMV
C) Potato X virus D) None of the above
55. In leaf parenchyma cells the virus moves approx.
A) 2 mm B) 4 mm
C) 1 mm D) 1.5 mm
56. Viruses which infect host without showing any symptoms is called
A) Latent virus B) Local lesions
C) Symptomless carrier D) None of the above
57. The insect order ,which is the vector of most of the viruses is
A) Lepidoptera B) Homoptera
C) Coleoptera D) Diptera
58. Grapevine fan leaf virus is transmitted by
A) Xiphinema index B) Longidorus
C) Paralongidorus D) Trichodorus
59. Antibody producing hybrid cells are called
A) Hybridomas B) Antiserum
C) Polyclonal antibodies D) None of the above
60. ds DNA containing virus is
A) Cauliflower mosaic virus B) Potato yellow dwarf virus
C) Rice ragged stunt virus D) TMV
61. Circulative viruses which can multiply in their respective vectors are called
A) Semi persistent virus B) Propagative virus
C) Non persistent virus D) None of the above
62. Prunus necrotic ring spot virus is transmitted by
A) Plant sap B) Leaf hopper
C) Pollen D) white fly

63. TMV was caused not by microorganism, but by a 'contagious living fluid' that called a virus was concluded by

A) Holmes B) Adolph Mayer
C) Beijerinck D) None of the above

64. Virus are described as-

1) "A virus is an infectious agent which could be transmitted by grafting yet is not to be retained by a bacteria- proof filter.
2) An agent is said to be a virus which do not transmissible cause disease in at least one host.
3) A sub-microscopic entity showing absolute obligate relationship with living cells and ability to cause specific disease.
4) A sub-microscopic obligate parasite consisting of nucleic acid and protein.

A)Both 1 & 2 B) B
C) 3&4 D) 1& 2

65. Plant viruses have been classified into-

A) 19 families& 80 groups B) 19 families & 81 groups
C) 18 families & 82 groups D) 18 families & 81 groups

66. Viruses which borne on stylet of their vectors-

A) Non -circulative non-persistent transmission
B) Non- circulative semi-persistent transmission
C) Persistent circulative non-propagative transmission
D) Persistent circulative-propagative transmission

67. An example of stylet- borne transmission in virus-vector-

A) Potyvirus B) Beet yellows virus
C) Tomato spotted wilt virus D) Citrus tristeza virus

68. Retention time of stylet-borne transmission-

A) 10-100 hours B) 4-10 hours
C) More than 100 hours D) 12 hours

69. Retention time of semi-persistent transmission-

A) 10-100 hours B) 4-10 hours
C) More than 100 hours D) 12 hours

70. Retention time of persistent type of transmission-

A) 10-100 hours B) 4-10 hours
C) More than 100 hours D) 2 hours

71. Latent period of persistent type of transmission

A) 4 hours B) 10 hours
C) 8 hours D) 12 hours or more

72. Example of semi-persistent or stylet borne transmission-

A) Bean yellow mosaic virus B) Citrus tristeza virus
C) Cauliflower mosaic virus D) Potato leaf roll virus

73. Example of Persistent type of transmission
A) Bean yellow mosaic virus B) Citrus tristeza virus
C) Cauliflower mosaic virus D) Potato leaf roll virus

74. Example of aphid transmitted viruses-
A) Bean yellow mosaic virus B) Citrus tristeza virus
C) Cauliflower mosaic virus D) All of the above

75. Rice dwarf virus is transmitted by-
A) *Nephotettix cinctiticeps* B) *B.Circulifer tenellus*
C) *Aphis gossypii* D) *Myzus persicae*

76. Largest groups insect vector are-
A) Aphids B) Leaf hopper
C) White flies D) Mealy bugs

77. Example of polyphagous aphids-
A) *Aphis gossypii* B) *Myzus persicae*
C) *Hyperomyzus latucae* D) All of the above

78. Whiteflies belong to which family-
A) Coccoidae B) Cicadellidae
C) Aleurodidae D) Delphacidae

79. Insect where all three types of virus-vector relationship (Stylet borne, circulative & propagative is observed-
A) Leaf hopper B) Whiteflies
C) Mites D) Aphids

80. Typically polyphagous whitefly-
A) *Bemisia tabacci* B) *Trialeurodes vaporarium*
C) *Trialeurodes abutiloneus* D) None of the above

81. Of the whitefly transmitted virus species 90% belongs to genus-
A) Crinivirus B) Ipomovirus
C) Begomovirus D) Closterovirus

82. Most NEPO viruses are-
A) Seed borne B) Vector transmitted
C) Soil borne D) None of the above

83. It is the minimum total time a vector needs to acquire a virus and inoculate it to a virus-free plant.
A) Retention period B) Latent period
C) Acquisition access period D) Transmission threshold period

84. Appearance of virus symptoms on a germinating seedling is a full proof evidence for the presence of _____ in the seed.
A) Viroid B) Bacteria
C) Virus D) Prions

85. Indicator plant of Cowpea mosaic virus-
A) *Vigna sinensis* B) *Phaseolus vulgaris*
C) *Avena fatua* D) *Chenopodium amaranticolor*

86. Baltimore classification was proposed in the year-
A) 1981 B) 1971
C) 1972 D) 1977

87. TMV comes under which group of virus
A) Tobamoviruses B) Tobraviruses
C) Pecluviruses D) Furoviruses

88. The entire genome of TMV consist of _____ nucleotides
A) 6350 B) 5400
C) 6400 D) 6800

89. Good diagnostic hosts with N gene for TMV-
A) *Datura stramonium* B) *Nicotiana glutinosa*
C) *Nicotiana tabacum* D) All of the above

90. TMV RNA has ___ORF (open reading frames)-
A) 1 B) 4
C) 7 D) 5

91. R gene for Potato virus X-
A) Rx B) Ry
C) Tm1 D) Tm2

92. The source plant of R gene Tm1 & Tm2 of TMV is
A) *Brassica napus* B) *Nicotiana tabacum*
C) *Lycopersicon esculentum* D) *Phaseolus vulgaris*

93. Cross protection described by-
A) Mckinney B) Holmes
C) W M Stanley D) I.A. Hoggan

94. Which tulip variety is susceptible to 'Tulipomania' caused by Tulip Breaking virus
A) Flax leaved tulip B) Tulipa pink impression
C) Semper augustus tulip D) Tulipa little beauty

95. Symptomless expression of disease caused by …… virus and transmitted only through pollen and seed
A) Cryptovirus B) Benyvirus
C) Furovirus D) Umbravirus

96. Necrotic island cells symptom on potato tubers caused by ……..
A) PVY B) PVX
C) PVA D) Both A and B

97. Groundnut rosette disease is caused by ……
A) Umbravirus B) Luteovirus
C) Umbravirus and cryptovirus D) Umbravirus and Luteovirus

98. The situation when a virus replicate initially on infected cell but cannot move to adjacent cell termed as ……

A) Sublocal infection B) Subliminal infection
C) Sublethel infection D) Lethal infection

99. …… inclusion body produced by ORF VI of caulimo virus helps in virus synthesis and assembly

A) Electron lucent B) Pinwheel
C) Electron dense D) Cylindrical

100. Symptomless infection

A) Coconut cadang cadang viroid B) Apple scar skin viroid
C) Hop stunt viroid D) Hop latent hop latent viroid

101. Citrus exocortis viroid concentration is high in

A) Nucleus B) Nucleoli
C) Nucleoplasm D) Chloroplast

102. How many structural domain present in *Pospiviridae* rod shaped viroid family

A) 6 B) 5
C) 3 D) 7

103. Large satellite RNAs (B type) associated with ……..

A) Nepovirus B) Tobamovirus
C) Luteovirus D) Carmovirus

104. An enzyme helps viral gene to bind with retinoblastoma proteins which directs the cell into S phase for their replication

A) RNA replicase B) Reverse Transcriptase
C) DNA polymerase D) DNA replicase

105. Type of virus encoded proteinases produced by *Caulimoviridae*

A) Cysteine B) Aspartate
C) Serine and cysteine D) Cysteine and aspartate

106. Triple gene block observed in which virus group helps virus movement in plant cell

A) Potexvirus B) Poty virus
C) Hordeivirus D) Both A and C

107. Range of point mutation for RNA viruses estimated approximately ……. per nucleotide per round of replication

A) 10-3 to 10-4 B) 10-11
C) 10-12 to 10-13 D) 10-2

108. Yellow leaf curl of tomato caused by ……

A) Tomato yellow leaf curl virus (TYLCV)
B) Tomato yellow leaf curl sardiana virus (TYLCSV)
C) Tomato yellow leaf curl sudan virus (TYLCSDV)
D) All the above

109. Tomato yellow leaf curl Malaga virus is a recombination between
A) TYLCV & TYLCSDV B) TYLCV & TYLCSV
C) TYLCSV & TYLCSDV D) TYLCV & GRV

110. Rhabdovirus envelope contains……. Proteins
A) 2 types of glycoproteins B) Matrix and coat proteins
C) Matrix and glycoproteins D) Coat protein and movement protein

111. Find the wrong match
A) Phytoreovirus – 12 particles B) Rice dwarf virus – 7 particles
C) Rice ragged stunt virus – 6 particles
D) Rice tungro virus – 5 particles

112. Functional introns found in
A) Rice tungro spherical virus B) Rice tungro bacilliform virus
C) Rice dwarf virus D) Rice ragged stunt virus

113. Atleast 80-90% of virus uncoating during their entry in plants occurs in …..
A) Cell wall B) Cytoplasm
C) Epidermis D) Nucleus

114. Who discovered dsDNA CaMV?
A) Goodman *et al*. (1977) B) Shepherd *et al*. (1968)
C) Shepherd *et al*. (1958) D) None of the above

115. Who discovered ssDNA virus- Geminivirus?
A) Goodman *et al*. (1977) B) Shepherd *et al*. (1968)
C) Shepherd *et al*. (1958) D) None of the above

116. Amongst the following which virus has split genome?
A) BMV B) TRV
C) TSWV D) All the above

117. Which of the following virus belongs to family *Bromoviridae*?
A) Ilarvirus B) Alfamovirus
C) Cucumovirus D) All of the above

118. Which of the following virus belongs to family *Closteroviridae*?
A) Closterovirus B) Ampelovirus
C) Both A and B D) None

119. Which of the following virus belongs to family *Comoviridae*?
A) Comovirus B) Fabavirus
C) Nepovirus D) All the above

120. Which of the following virus belongs to family *Flexiviridae*?
A) Potexvirus B) Carlavirus
C) Both A and B D) None of the above

121. Which of the following virus belongs to family *Luteoviridae*?
A) Luteovirus B) Polerovirus
C) Both A and B D) None of the above

122. Which of the following virus belongs to family *Potyviridae*?
A) Potyvirus B) Ipomovirus
C) Bymovirus D) All the above
123. Which of the following family is the largest single group of plant virus?
A) *Potyviridae* B) *Luteoviridae*
C) *Flexiviridae* D) *Bromoviridae*
124. *Rice Tungro spherical virus* belongs to which family?
A) *Sesquiviridae* B) *Tombusviridae*
C) *Flexiviridae* D) *Bromoviridae*
125. TNV belongs to which family?
A) *Tombusviridae* B) *Sesquiviridae*
C) *Flexiviridae* D) *Bromoviridae*
126. Which of the following family belongs to single stranded, negative sense, enveloped RNA virus?
A) *Rhabdoviridae* B) *Bunyaviridae*
C) Both A and B D) None of the above
127. Which of the following family belongs to double stranded RNA virus?
A) *Reoviridae* B) *Partitiviridae*
C) Both A and B D) None of the above
128. Which of the following family belongs to single stranded DNA virus?
A) *Geminiviridae* B) *Nanoviridae*
C) Both A and B D) None of the above
129. Who first observed the Tobacco necrosis satellite virus (TNSV)?
A) Holmes (1927) B) Bawden and Pirie (1928)
C) Bawden and Pirie (1938) D) None
130. Viroids were discovered by
A) Bawden and Pirie (1938) B) T.O Diener (1971)
C) T.O Diener (1961) D) Gross *et al*. (1978)
131. What is the molecular weight of viroids?
A) 100,00- 140,000 Daltons) B) 100,00- 120,000 Daltons
C) 100,00- 160,000 Daltons D) 100,00- 150,000 Daltons
132. Which of the following families belongs to viroids?
A) Pospiviroidae B) Avsunviroidae
C) Both A and B D) None
133. Which of the following host enzyme are used for viroid replication?
A) RNA polymerase II B) RNAse
C) RNA ligase D) All the above
134. Prions were discovered by
A) Bawden and Pirie (1938) B) T.O Diener (1971)
C) Prusiner (1982) D) None

135. Victorin or HV toxin is produced by which organism?
A) *Cochliobolus victoriae* B) *C. carbonum*
C) *C. heterosporus* D) None

136. Tentoxin is produced by which organism?
A) *Alternaria alternate* B) *Cochliobolus victoriae*
C) *C. carbonum* D) *C. heterosporus*

137. Inclusion bodies are produced by
A) Virus B) Protozoa
C) Bacteria D) Fungi

138. Size of tobacco necrosis satellite virus is
A) 15 nm B) 16 nm
C) 17 nm D) 18 nm

139. Size of wound tumor virus is
A) 55nm B) 60nm
C) 65nm D) 70nm

140. The genome of tobacco rattle virus is split into
A) 2 B) 3
C) 4 D) 5 parts

141. Per cent of protein in virus
A) 50 % B) 69 %
C) 60 to 95% D) 80 %

142. Satellite RNAs are.....to the RNA of the virus
A) Not related B) Partially related
C) Related D) Option A and B

143. The infectivity of viruses is strictly the property of.....
A) Protein B) The nucleic acid
C) Both D) None

144. The first intact virions appear in plant cells approximately.....hours of inoculation
A) 8 B) 9
C) 10 D) 11

145. Luteoviruses codes for.....proteins
A) 4 B) 5
C) 6 D) 7

146. Raspberry Ring spot virus is transmitted by
A) *Longidorus* B) *Xiphenema*
C) Both D) None

147. Cucumovirus is transmitted by aphids in.....manner
A) Persistant B) Semi persistant
C) Non persistant D) None

148. Ilarvirus codes for ..... proteins
A) 3 B) 4
C) 5 D) 6

149. Most widespread virus disease of stone fruit trees is.....
A) Prunus Necrotic Ring Spot B) Cacao swollen shoot virus
C) Both D) None

150. Wound tumor virus falls in
A) Bromoviridae B) Rhabhdoviridae
C) Reoviridae D) None

151. Tomato spotted wilt virus infects
A) Monocots B) Dicots
C) Both D) None

152. Tomato spotted wilt virus is transmitted by
A) Nematode B) Thrips
C) Fungi D) None

153. Which of the tenuivirus is not passed transovarially to 30 to 100% of the vector progeny?
A) Rice hoja blanca virus B) Rice grassy stunt virus
C) Rice stripe virus D) Maize stripe virus

154. Banana streak virus is transmitted by
A) Aphid B) Whitefly
C) Mealy bugs D) Mechanically

155. Tomato pseudo-curly top virus is transmitted by
A) Aphid B) Whitefly
C) Treehopper D) Leafhopper

156. Coconut foliar decay virus is transmitted by
A) *Myndus taffini* B) Treehopper
C) Aphid D) Whitefly

157. Banana bunchy top virus is transmitted by
A) *Myndus traffini* B) *Pentalonia nigrinervosa*
C) Both D) None

158. Tomato mottle virus is a ..... geminivirus
A) Monopartite B) Bipartite
C) Multipartite D) None

159. Which of the following virus belong to Circoviridae
A) Banana bunchy top virus B) Coconut foliar decay virus
C) Faba bean yellow necrotic viru D) All

160. African cassava mosaic virus is transmitted by
A) Aphids B) Whitefly
C) Treehopper D) Planthopper

161. *Circulifera tenellus* is a vector for
A) African cassava mosaic virus B) Beet curly top virus
C) Cucumber mosaic virus D) Mungbean yellow mosaic virus
162. Which of the virus is transmitted by sap in field condition?
A) Potato virus X B) Tobacco mosaic virus
C) Cucumber mosaic virus D) All
163. Days taken for a systemic infection to develop is
A) 5-6 B) 7-8
C) 9-13 D) 10-14
164. Cauliflower mosaic virus is a
A) dsRNA B) ssRNA
C) dsDNA D) ssDNA
165. Lettuce big vein virus is transmitted by
A) Aphid B) Fungus
C) Nematode D) Mechanically
166. Rice ragged stunt virus is a
A) dsRNA B) dsDNA
C) ssRNA D) ssDNA
167. Local lesions appear within
A) 2 days B) 3-7days
C) 4-5days D) 5-6 days
168. Stylet borne transmission is also known as
A) Persistant B) Semi persistant
C) Non persistant D) None
169. Peach mosaic virus is transmitted by
A) Aphids B) Mites
C) Leafhopper D) Planthoppers
170. TMV contains
A) 95 % protein and 5 % RNA B) 95 % protein and 5 % DNA
C) 5 % protein and 95 % RNA D) 5% protein and 95 % DNA
171. The first virus to be shown that plants infected with it contained a specific antigen is
A) TMV B) CMV
C) ChiVMV D) None
172. Virus is transmitted by
A) Seed B) Mechanically
C) Pollen D) All
173. Select the incorrect pair
A) Twort and d'Herelle – Bacteriophages
B) B Goldstein – Distinguished two types of cell inclusion

C) Hoggan – First report of *Myzuspersicae* as a vector
D) F.O. Holmes- Grouped viruses into persistent and non-persistent

174. Select the incorrect pair
A) Relationship between rice dwarf disease and leaf hoppers – Hashimoto
B) Rice dwrf passes through 7 generations of leaf hoppers – T. Fukushi
C) Nematode as vector of viruses – McKinney
D) Fungi as vector of viruses – Grogan

175. a) The time for which an initially virus free vector feeds on a virus source
b) The time for which an initially virus free vector is allowed access to a virus source
c) The time for which a virus carrying vector feeds on a virus free plant
d) The time for which a virus carrying vector is allowed access to a virus-free-plant Match the following
1. Acquisition access period
2. Acquisition feeding period
3. Inoculation access period
4. Inoculation feeding period

A) 1-b, 2-a, 3-c, 4-d B) 1-d, 2- a, 3- d, 4- c
C) 1 b, 2- c, 3- d, 4- a D) 1-b, 2-a, 3- d, 4-c

176. The thermal inactivation point of non-persistent viruses is
A) 60°C B) 69°C
C) 70°C D) 65°C

177. Majority of the stylet borne viruses are transmitted by
A) Whitefly B) Thrips
C) Aphid D) Leaf hopper

178. Which one of the following is not a semi-persistent plant virus
A) Bean yellow mosaic virus B) Cauliflower mosaic virus
C) Soybean mosaic virus D) Cowpea mosaic virus

179. All species of nematodes known to transmit viruses belongs to the order
A) Tylenchida B) Dorylaimida
C) Aphelenchida D) Rhabditida

180. NEPO (Nematode transmitted polyhedral) viruses are transmitted by
A) Longidorus B) Xiphinema
C) Both A and B D) Paralongidorus

181. NEPO virus group includes
A) Tomato black ring virus B) Grape vine fan leaf virus
C) Tobacco ring spot virus D) Cherry leaf roll virus

182. *Synchytrium endobioticum* transmits
A) Potato virus X B) Potato virus Y
C) Potato mop top virus D) Tobacco necrosis virus

183. Intumescence or blister formation due to increase in intercellular water, as in leaves is known as

A) Osmosis B) Odema
C) Accumulation D) Inclusion

184. Select the incorrect statement about whitefly

A) They belong to the order Hemiptera and are important pests
B) Presently three whitefly species viz., Bemisia tabaci, Trialeurodes vaporariorum and T abutiloneus are known to be vectors of viruses
C) They take in viruses through sucking through stylet from phloem

185. Females are more efficient than males in transmission and there is a transovarial passage of the virus

a) Feeds only on the phloem
b) Main method of spread is by wind
c) Eats the parenchyma tissue between vascular bundles leaving holes in the leaf
d) The three types of virus-vector relationship i.e., stylet borne, circulative and propagative have been observed

Match the following

1 Thrips
2 Beetle
3 Mites
4 Leaf hopper

A) 1-a, 2-b,3-c,4-d
B) 1-a, 2-c,3-b,4-d
C) 1-a, 2-b,3-d,4-c
D) 1-a, 2-c,3-d,4-b

186. The first successful experiment done to proof that several viruses that cause diseases multiply in their insect-vector was done by

A) Black & Brakke (1952)
B) Watson and Robert (1939)
C) Kennedy *et al*. (1962)
D) Bauer (1904)

187. Who first showed that grapevine fan leaf virus is transmitted by dagger nematode, *Xiphinema index*

A) Hewitt et al., (1958)
B) Bennett (1940)
C) Black & Brakke (1952)
D) Bauer (1904)

188. The thermal inactivation point of NEPO viruses lies between
A) 45-50 °C B) 55-70 °C
C) 75-90 °C D) 95-100 °C

189. Select the incorrect pair based on predators used for vector control
A) Aphid – *Hippomania convergens, Chrysoparu filabris, Coccinella septumpunctata*
B) Whitefly – *Delphastus pusillus, Macrolophus cologinosus*
C) Hoppers – *Cryptolaemus montrouzieri*
D) Mealy bug – *Chrysoperla carnea*
E) Both C and D

190. Find the incorrect pair
A) Thermal Inactivation Point (TIP): The temperature at which a virus is rendered inactive when kept for 10 minutes.
B) Dilution End Point (DEP): The maximum dilution in multiples of 10, beyond which infectivity is lost.
C) Longevity or ageing in vitro end-point: The period for which the virus preparation remains active in the laboratory at about 20°C.
D) Horizontal resistance: A high level of host resistance but one that may be circumvented by the pathogen and is therefore often race or strain specific.

191. Stanley on crystalline chemical molecule of TMV won Nobel Prize in the year
A) 1943 B) 1944
C) 1945 D) 1946

192. Size of TMV
A) 240nm B) 200nm
C) 180nm D) 280nm

193. Thermal inactivation point of CMV is_____ and Dilution End Point (DEP) is_____
A) 65 °C, 1:1000 B) 75 °C, 1:1000
C) 60 °C, 1:10000 D) 70 °C, 1:10000

194. Virus is a-
A) Nucleoprotein B) Nucleoside
C) Nucleotide D) None

195. Total number of viruses known till date exceeds-
A) 2000 B) 3000
C) 1000 D) 5000

196. Genetic material of a virus consists of-
A) DNA or RNA B) RNA only
C) DNA only D) All of them

197. Rhabdoviruses are -
A) Bacilliform B) Cylindrical rod
C) Short D) All of them

198. Split genome consists of
A) Two or more distinct nucleic acid strands encapsidated in different particles
B) Only one type of nucleic acid is present
C) Only proteins are found
D) None

199. Lipoprotein envelops are present in –
A) Retrovirus B) Rhabdovirus
C) Bacteriophages D) All of them

200. Weight of 12 component wound tumor virus is-
A) 15×106 daltons B) 11×106 daltons
C) 16×106 daltons D) None

201. Thymine is also known as –
A) Uracil B) Methyl uracil
C) Pyrimidine D) None

202. The role of viral protein coat is-
A) Protective sheath B) Vector transmissibility
C) Increase in infectivity of nucleic acid
D) All of these

203. The enzyme that synthesizes RNA from a DNA is –
A) RNAase B) RNA transcriptase
C) RNA polymerase D) None

204. Viruses enter cells by means of-
A) Wounds B) By vectors
C) By infected pollen grains D) All of them

205. The first intact virions appear in plant cells approximately after inoculation of –
A) 10 hr B) 12 hr
C) 15 hr D) 11 hr

206. After infection in host cells viruses multiply in –
A) Parenchyma cells B) Plasmodesmata
C) Mitochondria D) All of them

207. Respiration of plants immediately after infection by a virus is-
A) Decreases B) Increases
C) No change D) None

208. Most common and economically important means of virus transmission is-
A) Pollen B) Seed
C) Insect D) All of them

209. Viruses that persist in vector for 1 to 4 days are generally known as-
A) Propagative virus B) Non-propagative
C) Semi-persistent D) None

210. Viruses transmitted by insects with chewing mouthparts are called-

A) Non-propagative B) Propagative

C) Circulative D) Non-circulative

211. Insect vectors that acquire and inoculate the virus after short feeding periods of a few seconds to a few minutes are called

A) Non-persistent B) Semi-persistent

C) Persistent D) None

212. Circulative viruses that multiply in their respective vectors are known as-

A) Non-propagative B) Propagative

C) Semi-propagative D) None

213. Nepo viruses are transmitted by –

A) Fungi B) Nematodes

C) Bacteria D) Aphids

214. Tobacco rattle and pea early browning viruses are transmitted by-

A) Trichodorus B) Paratrichodorus

C) Both D) None

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VIROLOGY

1. Ans: B, Bymovirus (Source: The elements of Plant Virology by Kolte and Tewari, Page No-131)
2. Ans: D, All of the above (Source: The elements of Plant Virology by Kolte and Tewari, Page No-134)
3. Ans: C, Fijivirus (Source: The elements of Plant Virology by Kolte and Tewari, Page No-133)
4. Ans: C, Both A and B (Source: The elements of Plant Virology by Kolte and Tewari, Page No-134)
5. Ans: B, Persistent (Source: The elements of Plant Virology by Kolte and Tewari, Page No-51)
6. Ans: C, Persistent (Source: The elements of Plant Virology by Kolte and Tewari, Page No-51)
7. Ans: D, Both A and B (Source: The elements of Plant Virology by Kolte and Tewari, Page No-51)
8. Ans: B, M.W. Beijerink (Source: The elements of Plant Virology by Kolte and Tewari, Page No-27)
9. Ans: A, M. Knoll & E. Ruska (Source: The elements of Plant Virology by Kolte and Tewari, Page No-27)
10. Ans: D, Adolf Mayer (Source: The elements of Plant Virology by Kolte and Tewari, Page No-27)
11. Ans: D, D. Ivanowaski (Source: The elements of Plant Virology by Kolte and Tewari, Page No-27)
12. Ans: B, W. M. Stanley (Source: The elements of Plant Virology by Kolte and Tewari, Page No-27)
13. Ans: D, Kassanis (Source: The elements of Plant Virology by Kolte and Tewari, Page No-27)
14. Ans: A, Heat (Source: The elements of Plant Virology by Kolte and Tewari, Page No-204)
15. Ans: C, Virion (Source: The elements of Plant Virology by Kolte and Tewari, Page No-111)
16. Ans: B, Monopartite (Source: The elements of Plant Virology by Kolte and Tewari, Page No-112)
17. Ans: D, All of the above (Source: The elements of Plant Virology by Kolte and Tewari, Page No-133)
18. (Ans: D, All of the above (Source: The elements of Plant Virology by Kolte and Tewari, Page No-133)
19. (Ans: D, All of the above (Source: The elements of Plant Virology by Kolte and Tewari, Page No-132)

20. Ans: D, All of the above (Source: The elements of Plant Virology by Kolte and Tewari, Page No-133)
21. Ans- c. 5-40% (page- 729, G.N. Agrios 5th edition)
22. Ans- b. Spherical viruses (page- 729, G.N. Agrios 5th edition)
23. Ans- d. Potyvirus (page- 727, G.N. Agrios 5th edition)
24. And- d. 158 (page- 730, G.N. Agrios 5th edition)
25. Ans- a. ssRNA, dsRNA, 40, 110(page- 731, G.N. Agrios 5th edition)
26. Ans c. 17.6K (page- 732, G.N. Agrios 5th edition)
27. Ans. c. Both a and b (page- 737, G.N. Agrios 5th edition)
28. Ans- b. Natural root grafts (page- 739, G.N. Agrios 5th edition)
29. Ans- a. Non-persistent (page- 742, G.N. Agrios 5th edition)
30. Ans- d. Both a and c (page- 742, G.N. Agrios 5th edition)
31. Ans- c. Tobacco rattle virus (page- 749, G.N. Agrios 5th edition)
32. Ans- d. Chrysomelid beetles (page- 750, G.N. Agrios 5th edition)
33. Ans- a. Membranous circular particle (page 750, G.N. Agrios 5th edition)
34. Ans- a. (+)ssDNA (page 751, G.N. Agrios 5th edition)
35. Ans- b. Ribavirin (page- 756, G.N. Agrios 5th edition)
36. Ans- c. Closterovirus (page- 774, G.N. Agrios 5th edition)
37. Ans- d.Waikavirus (page- 779, G.N. Agrios 5th edition)
38. Ans. a.Furovirus (Page- 761, G.N. Agrios 5th edition)
39. Ans. d. All of the above (page- 750, G.N. Agrios 5th edition)
40. Ans- d. All of the above(page 821, G.N. Agrios 5th edition)
41. Ans. c. Beijerinck (page- 2, Plant viruses, diseases and their management, K.K. Biswas)
42. Ans. d. Both b and c (page- 4, Plant viruses, diseases and their management, K.K. Biswas)
43. Ans. b.Kassanis (page- 5, Plant viruses, diseases and their management, K.K. Biswas)
44. Ans. d. Fukushi (page- 4, Plant viruses, diseases and their management, K.K. Biswas)
45. Ans. b. Rosalind Franklin (Page- 4, Plant viruses, diseases and their management, K.K. Biswas)
46. Ans. c. Kaper *et al* (page- 6, Plant viruses, diseases and their management, K.K. Biswas)
47. Ans: A. Neuraminidase (Source : Plant Bacteriology, pg : 235)
48. Ans: D. Andre.L. Woff (Source : Plant Bacteriology, pg : 231)
49. Ans: B. Nucleoid (Source : Plant Bacteriology, pg : 233)
50. Ans: B. 252 (Source : Plant Bacteriology, pg : 234)
51. Ans: A. d'Herelle (Source : Plant Bacteriology, pg : 240)
52. Ans: C. Gierer & Schramm (Source : Plant Bacteriology, pg : 242)

53. Ans: B. 1-3 X 106 Daltons (Source : Plant pathology by G.N Agrios, pg: 730)
54. Ans: A. Satellite viruses (Source : Plant pathology by G.N Agrios, pg: 731)
55. Ans: C. 1mm (Source : Plant pathology by G.N Agrios, pg: 733)
56. Ans: A. Latent virus (Source : Plant pathology by G.N Agrios, pg: 737)
57. Ans: B. Homoptera (Source : Plant pathology by G.N Agrios, pg: 741)
58. Ans: A. Xiphinema index (Source : Plant pathology by G.N Agrios, pg: 742)
59. Ans: A. Hybridomas (Source : Plant pathology by G.N Agrios, pg: 744)
60. Ans: A. Cauliflower mosaic virus (Source : Plant pathology by G.N Agrios, pg: 750)
61. Ans: B. Propagative virus (Source : Plant pathology by G.N Agrios, pg: 742)
62. Ans: C. Pollen (Source : Plant pathology by G.N Agrios, pg: 741)
63. Ans: C Beijerinck (p no.-25)

(SOURCE-THE ELEMENTS OF PLANT VIROLOGY BY S.J. KOLTE & A.K. TEWARI)

64. Answer-c) 1,3&4 (page no.-6)
65. Answer- b) 19 families & 81 groups (page no.-122)
66. Answer- a)Non- circulative non-persistent transmission (page no.-48)
67. Answer -a)Potyvirus(p no. 51)
68. Answer- b) 4-10 hours(p no. 51)
69. Answer-a) 10-100 hours(p no. 51)
70. Answer- c) More than 100 hours(p no. 51)
71. Answer- d) 12 hours or more(p no. 51)
72. Answer- c) Cauliflower mosaic virus(p no. 51)
73. Answer-b) Citrus tristeza virus
74. Answer-d) All of the above(p no. 51)
75. Answer- a)*Nephotettix cinctiticeps*(p no.-51)
76. Answer- a) Aphids(p no.-52)
77. Answer- b) *Myzus persicae*(p no.-54)
78. Answer- c) Aleurodidae(p no.-52)
79. Answer- a) Leaf hopper(p no.-54)
80. Answer -a*) Bemisia tabacci*(p no.-55)
81. Answer- c)Begomovirus(p no.-55)
82. Answer- a) seed borne (p no.-45)
83. Answer- d) Transmission threshold period(p no.-48)
84. Answer- c) Virus (p no.-278)
85. Answer- d*) Chenopoduim amaranticolor*
86. Answer- b) 1971 (p no.-129)
87. Answer- a) Tobamoviruses (p no.-137)
88. Answer- c) 6400 (p no.-137)

89. Answer -All of the above (p no.-137)
90. Answer- b) 4 (P no.-137)
91. Answer- a) Rx (p no.-210)
92. Answer- c) *Lycopersicon esculentum*(p no.-210)
93. Answer-a)Mckinney(p no.-18)
94. **Ans: C**, Semper Augustus Tulip (Source: Comparative plant virology, Roger Hull, Page No. 5)
95. **Ans: A**, Cryptovirus (Source: Comparative plant virology, Roger Hull, Page No. 29)
96. **Ans: B**, PVX (Source: Comparative plant virology, Roger Hull, Page No. 32)
97. **Ans: D**, Umbravirus & Luteovirus (Source: Comparative plant virology, Roger Hull, Page No. 27)
98. **Ans: B**, Subliminal infection (Source: Comparative plant virology, Roger hull, Page No. 40)
99. **Ans: C**, Electron dense (Source: Comparative plant virology, Roger Hull, Page No. 35)
100. **Ans: D**, Hop Latent viriod (Source: Comparative plant virology, Roger Hull, Page No. 44)
101. **Ans: C**, Nucleoplasm (Source: Comparative plant virology, Roger Hull, Page No. 45)
102. **Ans: B**, 5 (Source: Comparative plant virology, Roger Hull, Page No. 47)
103. **Ans: A**, Nepovirus (Source: Comparative plant virology, Roger Hull, Page No. 53)
104. **Ans: D**, DNA Replicase (Source: Comparative plant virology, Roger Hull, Page No. 68)
105. **Ans: B**, Aspartate (Source: Comparative plant virology, Roger Hull, Page No. 70)
106. **Ans: D**, Both A and C (Source: Comparative plant virology, Roger Hull, Page No. 71)
107. **Ans: A**, 10 -3 to 10 -4 (Source: Comparative plant virology, Roger Hull, Page No. 74)
108. **Ans: D**, All of the above (Source: comparative plant virology, Roger Hull, Page No. 76)
109. **Ans: B**, TYLLV and TYLCSV (Source: Comparative plant virology, Roger Hull, Page No. 76)
110. **Ans: C**, Matrix & Glycoprotein (Source: Comparative plant virology, Roger Hull, Page No. 102)
111. **Ans: D**, Rice Tungro virus – 5 partite (Source: comparative plant virology, Roger Hull, Page No. 101)
112. **Ans: B**, Rice Tungro Bacilliform Virus (Source: Comparative plant virology, Roger Hull, Page No.106)
113. **Ans: C**, Epidermis (Source: Comparative plant virology, Roger Hull, Page No. 122)

114. **Ans: B,** Shepherd et al (1968) **(**Source: HC Dube: Modern Plant Pathology, page: 77)
115. **Ans: A,** Goodman et al (1977) **(**Source: HC Dube: Modern Plant Pathology, page: 77)
116. **Ans: D,** All of the above **(**Source: HC Dube: Modern Plant Pathology, page: 78)
117. **Ans: D,** All of the above (Source: HC Dube: Modern Plant Pathology, page: 82)
118. **Ans: C,** Both A & B **(**Source: HC Dube: Modern Plant Pathology, page: 82)
119. **Ans: D,** All of the above **(**Source: HC Dube: Modern Plant Pathology, page: 83)
120. **Ans: C,** Both A & B **(**Source: HC Dube: Modern Plant Pathology, page: 83)
121. **Ans: C,** Both A & B **(**Source: HC Dube: Modern Plant Pathology, page: 83)
122. **Ans: D,** All of the above **(**Source: HC Dube: Modern Plant Pathology, page: 83)
123. **Ans: A,** Potyviridae **(**Source: HC Dube: Modern Plant Pathology, page: 83)
124. **Ans: A,** Sequiviridae **(**Source: HC Dube: Modern Plant Pathology, page: 83)
125. **Ans: A,** Tobusviridae **(**Source: HC Dube: Modern Plant Pathology, page: 83)
126. **Ans: C,** Both A & B **(**Source: HC Dube: Modern Plant Pathology, page: 85)
127. **Ans: C,** Both A & B **(**Source: HC Dube: Modern Plant Pathology, page: 86)
128. **Ans: C,** Both A & B **(**Source: HC Dube: Modern Plant Pathology, page: 86, 87)
129. **Ans: C,** Bawden & Pirie (1938) Source: HC Dube: Modern Plant Pathology, page: 101)
130. **Ans: B,** T.O Deiner (1971) **(**Source: HC Dube: Modern Plant Pathology, page: 104)
131. **Ans: A,** 1000-140000 Daltons **(**Source: HC Dube: Modern Plant Pathology, page: 104)
132. **Ans: C,** Both A & B **(**Source: HC Dube: Modern Plant Pathology, page: 105)
133. **Ans: D,** All of the above **(**Source: HC Dube: Modern Plant Pathology, page: 106)
134. **Ans: C,** Pruseiner (1982) **(**Source: HC Dube: Modern Plant Pathology, page: 106)
135. **Ans: A,** *Cochliobolus victorae* **(**Source: HC Dube: Modern Plant Pathology, page: 179)
136. **Ans: A,** *Alternaria alternata* **(**Source: HC Dube: Modern Plant Pathology, page: 180)
137. **Ans: A**, Virus (Source: Plant Pathology, Agrios, Pg-725)
138. **Ans: C**, 17nm (Source: Plant Pathology, Agrios, Pg-729.)
139. **Ans B**, 60nm (Source: Plant Pathology, Agrios, Pg-729.)
140. **Ans A**, 2 (Source: Plant Pathology, Agrios, Pg-729.)
141. **Ans C**, 60-95% (Source: Plant Pathology, Agrios, Pg-729.
142. **Ans: D**, Otion A & B (Source: Plant Pathology, Agrios, Pg-731.)
143. **Ans: B**, Nucleic Acid (Source: Plant Pathology, Agrios, Pg-731.)
144. **Ans: C**, 10 (Source: Plant Pathology, Agrios, Pg-733.)
145. **Ans: C**, 6 (Source: Plant Pathology, Agrios, Pg-781.)
146. **Ans: A**, Longidorus (Source: Plant Pathology, Agrios, Pg-787.)
147. **Ans C**, Non-persistent (Source: Plant Pathology, Agrios, Pg-788)

148. **Ans: B**, 4 (Source: Plant Pathology, Agrios, Pg-790)
149. **Ans: A**, Prunus Necroric Virus (Source: Plant Pathology, Agrios, Pg-791)
150. **Ans**: **C**, Reoviride (Source: Plant Pathology, Agrios, Pg-792)
151. **Ans: C**, Both (Source: Plant Pathology, Agrios, Pg-796)
152. **Ans: B**, Thrips (Source: Plant Pathogolgy, Agrios, Pg-799)
153. **Ans: B**, Rice Grassy Stunt Virus (Source: Plant Pathology, Agrios, Pg-801)
154. **Ans: C**, Mealy Bugs (Source: Plant Pathology, Agrios, Pg-803)
155. **Ans: C**, Tree Hopper (Source: Plant Pathology, Agrios, Pg-805)
156. **Ans: A**, Myndus taffini (Source: Plant Pathology, Agrios, Pg-815)
157. **Ans: B**, *Pentalonia nigronervosa* (Source: Plant Pathology, Agrios, Pg-814)
158. **Ans: B**, Bipartite (Source: Plant Pathology, Agrios, Pg-812)
159. **Ans: D**, All (Source: Plant Pathology, Agrios, Pg-813)
160. **Ans: B**, Whitefly (Source: Plant Pathology, Agrios, Pg-810)
161. **Ans: B**, Beet Curly Top virus (Source: Plant Pathology, Agrios, Pg-809)
162. **Ans: D**, All (Source: Plant Pathology, Agrios, Pg-739)
163. **Ans: D**, 10-14 (Source: Plant Pathology, Agrios, Pg-739)
164. **Ans: C**, dsDNA (Source: Plant Pathology, Agrios, Pg-750)
165. **Ans: B**, Fungus (Source: Plant Pathology, Agrios, Pg-750)
166. **Ans: A**, dsRNA (Source: Plant Pathology, Agrios, Pg-750)
167. **Ans: B**, 3-7 days (Source: Plant Pathology, Agrios, Pg-739)
168. **Ans: C**, Non-persistent (Source: Plant Pathology, Agrios, Pg-742)
169. **Ans: B**, Mites (Source: Plant Pathology, Agrios, Pg-742)
170. **Ans: A**, 95 % Protein, 5% RNA (Source: Plant Pathology, Agrios, Pg-757)
171. **Ans: A**, TMV (Source: Plant Pathology, Agrios, Pg-757)
172. **Ans: D**, All (Source: Plant Pathology, Agrios, Pg-741)
173. **Ans: D**, F.O. Holmes- Group viruses into persistent and non-persistent (Source: Elements of plant virology, Pg – 17-20)
174. **Ans: C**, Nematode as vector of viruses- Mckinney (Source: Elements of plant virology, Pg – 27)
175. **Ans: D**, 1b, 2a, 3d, 4c (Source: Elements of plant virology, Page 47)
176. **Ans: A**, 60ºC (Source: Elements of plant virology, Page 48)
177. **Ans: C**, Aphid (Source: Elements of plant virology, Page 48)
178. **Ans: B**, Cauliflower mosaic virus (Source: Elements of plant virology, Page 51)
179. **Ans: B**, Dorylaimida (Source: Elements of plant virology, Page 59)
180. **Ans: C**, Both A and B (Source: Elements of plant virology, Page 59)
181. **Ans: D**, Cherry Leaf Roll Virus (Source: Elements of plant virology, Page-59)
182. **Ans: A**, PVX (Source: Elements of plant virology, Page 60)
183. **Ans: B**, Odema (Source: Elements of plant virology, Page 306)
184. **Ans: D** (Source: Elements of plant virology, Page 55)
185. **Ans: B**, 1a, 2c, 3b, 4d (Source: Elements of plant virology, Page 54-57)
186. **Ans: A**, Black & Brakke (1952) (Source: Elements of plant virology, Page 50)

187. **Ans: A**, Hewitt et al. (1958) (Source: Elements of plant virology, Page 58)
188. **Ans: B**, 55-70ºC (Source: Elements of plant virology, Page 59)
189. **Ans: E**, Both C and D (Source: Elements of plant virology, Page 208)
190. **Ans: D**, Horizontal resistance (Source: Elements of plant virology, Page 191)
191. **Ans: D**, 1946 (Source: Elements of plant virology,Page 161)
192. **Ans: A**, 240nm (Source: Elements of plant virology, Page 138)
193. **Ans: D**, 70ºC -1:10000 (Source: Elements of plant virology, Page 150)
194. **Ans: A**, Nucleoprotein (Source: G. N. Agrios, Plant Pathology, Page no.: 724)
195. **Ans: A**, 2000 (Source: G. N. Agrios, Plant Pathology, Page no.: 724)
196. **Ans: A**, DNA or RNA (Source: G. N. Agrios, Plant Pathology, Page no.: 724)
197. **Ans: A**, Bacilliform (Source: G. N. Agrios, Plant Pathology, Page no.: 725)
198. **Ans: A,** Source: G. N. Agrios, Plant Pathology, Page no.: 725)
199. **Ans: B**, Rhabdovirus (Source: G. N. Agrios, Plant Pathology, Page no.: 725)
200. **Ans: C**,16 X 106 Daltons (Source: G. N. Agrios, Plant Pathology, Page no.: 729)
201. **Ans: B**, Methyl Uracil (Source: G. N. Agrios, Plant Pathology, Page no.: 730)
202. **Ans: D**, All of these (Source: G. N. Agrios, Plant Pathology, Page no.: 730)
203. **Ans: C**, RNA Polymerase (Source: G. N. Agrios, Plant Pathology, Page no.: 730)
204. **Ans: D**, All of them (Source: G. N. Agrios, Plant Pathology, Page no.: 733)
205. **Ans: A**, 10 hour (Source: G. N. Agrios, Plant Pathology, Page no.: 733)
206. **Ans: A**, Parenchyma cells (Source: G. N. Agrios, Plant Pathology, Page no.: 730)
207. **Ans: B**, Increases (Source: G. N. Agrios, Plant Pathology, Page no.: 739)
208. **Ans: C**, Insect (Source: G. N. Agrios, Plant Pathology, Page no.: 741)
209. **Ans: C**, Semi-persistent (Source: G. N. Agrios, Plant Pathology, Page no.: 741)
210. **Ans: C**, Circulative (Source: G. N. Agrios, Plant Pathology, Page no.: 742)
211. **Ans: A**, Non-persistent (Source: G. N. Agrios, Plant Pathology, Page no.: 742)
212. **Ans: B**, Propagative (Source: G. N. Agrios, Plant Pathology, Page no.: 742)
213. **Ans: B**, Nematode (Source: G. N. Agrios, Plant Pathology, Page no.: 742)
214. **Ans: C**, Both (Source: G. N. Agrios, Plant Pathology, Page no.: 742)

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7. DISEASES OF CROP PLANTS

1. Rust of soyabean is caused by
   A. Puccinia B. Uromyces
   C. Phakospora D. Phragmidium
2. Genus Phragmidium causes rust disease in
   A. Rose B. Cedar Apple
   C. Pine D. Linseed
3. Which of the following can be grown in culture medium
   A. Rust fungi B. Powdery Mildew
   C. Downy Mildew D. All of the Above
4. Sudden oak death is caused by
   A. *Phytophthora cinnamoni* B. *Phytophthora lateralis*
   C. *Phytophthora ramorum* D. None of the above
5. Downy mildew of onion is caused by
   A. *Peronospora destructor* B. *Peronospora parasitica*
   C. *Peronospora effuse* D. None of the above
6. Downy mildew of crucifers is caused by
   A. *Peronospora destructor* B. *Peronospora parasitica*
   C. *Peronospora effuse* D. None of the above
7. Most devastating disease of potato in the world
   A. Early blight disease B. Late Blight disease
   C. Potato leaf Roll D. Bacterial wilt of Potato
8. Peach leaf curl is caused by
   A. Virus B. Fungi
   C. Bacteria D. Viroid
9. Powdery mildew in rose is caused by
   A. Microsphaera B. Sphaerotheca
   C. Uncinula D. Podosphaera
10. Powdery mildew of apple and pear is caused by
    A. Microsphaera B. Sphaerotheca
    C. Uncinula D. Podosphaera
11. "Honey dew stage" is seen in disease
    A. Anthracnose of bean B. Scab of apple
    C. Ergot of Sorghum D. Smut of maize

12. The alternate host of stem rust of wheat
    A. Rice B. Sugarcane
    C. Barberry D. Pea
13. Who developed aureofungin a new antifungal antibiotics for use in plant disease control
    A. Norman Borlaug B. Thirumalachar
    C. Vander Plank D. Luthra
14. Which one of the following is commonly called as "Bread mold"
    A. *Aspergillus niger* B. *Saccharomyces cerevisiae*
    C. *Rhizopus stolonifer* D. *Penicillium* spp.
15. *Saccharomyces cerevisiae* is used for
    A. Baking B. Brewing
    C. Brewing and Baking D. Brewing, Baking, and for making probiotic
16. Ciger end rot diseases of Banana caused by
    A. *Fusarium oxysporum f. sp.cubense*
    B. *Ralstonia Solanacearum*
    C. *Verticillium theobromae*
    D. *Mycospharellamusicola*
17. Red Stele diseases of strawberry caused by -
    A. *Colletotrichum fragariae* B. *Phytophthora fragariae*
    C. *Phytophthora caltorum* D. *Marssoninafragariae*
18. Choose the correct one- "Rice fever disease is"
    A. Rice Blast B. BLB
    C. Bacterial leaf streak D. Brown leaf spot
19. Anamorphic stage of brown leaf spot of rice
    A. *Pyriculariaoryzae* B. *Bipolarisoryzae*
    C. *Cochliobolusmiyabeanus* D. *Magnaporthe grisea*
20. Kresek phase is found in
    A. Rice blast B. BLB
    C. Bacterial leaf streak D. Brown leaf spot
21. Fire blight forecasting model are-
    A. BLITECAST B. MERYBLYT and COUGARBLIGHT
    C. FAST D. EPIDEM
22. Ratoon stunting of sugarcane caused by-
    A. *Acidovoraxavenae* B. *Leifsoniaxyli subsp. Xyli*
    C. *Xanthomonas axanopodisp.v.vasculorum*
    D. *Xanthomonas campestris p.v. campestris*

23. Pineapple disease of sugarcane is caused by-
A. *Ceratocystis paradoxa* B. *Leveillulataurica*
C. *Uromyces fabae* D. *Ceretostomellaparadoxa*

24. Akiochi disease is due to-
A. Sulphur toxicity B. Copper toxicity
C. Zinc toxicity D. Boron toxicity

25. Pahala blight of sugarcane due to deficiency of-
A. Mn B. Boron
C. Cu D. Mo

26. Zearalenone is a sex hormone produced by-
A. *Aspergillus* B. *Penicillium*
C. *Fusarium* D. *Rhizopus*

27. Orobanche is a
A. Holo root parasite B. Holo Stem parasite
C. Semi root parasite D. Root parasite

28. Organism that uses chemical compounds for energy is called as-
A. Obligate parasite B. Biotroph
C. Chemotroph D. Autotroph

29. A pore like opening in perithecia and pycnia through which spores escape from fruiting body is-
A. Ostiole B. Paraphysis
C. Ascostroma D. Locules

30. Wart disease of potato first reported in India from
A. Sikkim B. UP
C. Bihar D. Darjeeling

31. Smut of Pearl millet is caused by-
A. *Tolyposporiumpenicilliariae* *B.* *Sporisoriumscitaminium*
C. *Puccinia graministritici* *D.* *Puccinia recondite*

32. The process that aims at preventing entry of pathogens from infested areas into non-infested areas at international level or national level is called
A. Quarantine B. Isolation
C. Disease escape D. Inspection

33. Which of the following is not a method of the perpetuation of disease by the pathogen?
A. The entry of pathogen through natural openings
B. Reproduction by pathogen
C. Reducing the quantity of yield
D. Direct penetration of the pathogen

34. Sometimes the leaves are devoid of any pigment and look bleached or white. This condition is known as-
A. Albinism B. Etilation
C. Hyperplasia D. Chromosis

35. Pathogen causes excessive growth of host tissues due to the biochemical activity in the plant and causes abnormal increase in size of affected organs, this condition referred as
A. Hypertrophy B. Hyperplasia
C. Gummosis D. Both A & B

36. Earcockle disease of wheat is caused by
A. *Puccinia tritici* B. *Anguinatritici*
C. *Corynebacterium tritici* D. *None of these*

37. Which of the following is not a method by which pathogens affect the yield of crops?
A. Reduce the quantity of yield
B. Reduce the quality of crop produce
C. Increase in cost production
D. Increase the flowering period

38. Root knot of Brinjal (egg plant) is caused by
A. *Meloidogyne incognita*
B. *Fusarium udum*
C. *Pseudomonas rubrillineans*
D. *Anguina solanacearum*

39. Wilt of pigeon pea is caused by
A. *Xanthomanascitri* B. *Fusarium udum*
C. *Phytophthora infestans* D. *Pseudomonas rubrilineans*

40. White rust of crucifers by
A. Albugo B. Ustilago
C. Puccinia D. Phytophthora

41. Downy mildew disease is caused by
A. Albugo B. Puccinia
C. Peronospora D. Phytophothora

42. Wart disease of potato is caused by
A. *Personospora destructor* B. *Phytophthora infestans*
C. *Phythiumdebaryanum* D. *Synchytriumendobioticum*

43. Which is responsible for wood rot?
A. Erysiphe B. Polyporus
C. Lycoperdon D. None of these

44. The smut of pearlmillet (caused by *Toltjposporitunpenicillariaes*) is a
A. Internally seed borne B. Externally seed borne
C. Soil borne D. All of these

45. 'Little leaf' in Apple is caused by deficiency of–
A. Zn B. Bacteria
C. N D. Cl

46. Soil micro-organisms are most active at–
A. I8-20°C B. 26-28°C
C. 30-32°C D. 34-36 °C

47. Select the wrong pair–
A. Ergot of bajra: *Claviceps fusifonnis*
B. False smut of rice: *Ustilagonoidea virens*
C. Ergot of rye: *Claviceps purpurea*
D. Red rot of sugarcane: *Colletotrichum gloeosporiodes*

48. Rust includes in–
A. Deuteromycotina B. Basidiomycotina
C. Ascomycotina D. Oomycetes

49. The pathogen grows from the point of entry to varying extents without showing adverse effect on tissue through which it passes is known as
A. Systemic infection B. Invasion
C. Colonisation D. None of the above

50. Carrot bacterial gall disease is caused by-
A. *Rhizomonassuberifaciens* B. *Rhizobacterdaucus*
C. *Rhodococcussuberifaciens* D. *Rhizoctoniasolani*

51. Which of the following is an example of a seed-borne disease?
A. Black rot of cabbage B. Bean mosaic
C. Brown rot of potato D. All of the above

52. Which of the following bacteria is responsible for soft rots in plants?
A. *Erwiniaamylovora* B. *Xanthomonascampestris*
C. *Erwiniacarotovora* D. All of the above

53. Bacterial sorghum and corn strips are caused by-
A. *Pseudomonas andropogonis* B. *Pseudomonas avenae*
C. *Pseudomonas rubrilineans*
D. *Pseudomonas syringae*p.v.*tabaci*

54. Which of the following is an example of a seed-borne disease?
A. Bacterial blight of rice
B. Black arm or angular leaf spot of cotton
C. Grassy shoot of sugarcane
D. All of the above

55. Which of the following plant pathogenic bacteria is responsible for peach bacterial decline and canker?
A. *Pseudomonas syringae*p.v.*persicae*
B. *Pseudomonas syringae*p.v.*morspurnorum*
C. *Pseudomonassyringae*p.v.*syringae*
D. None of the above

56. Which of the following plant pathogenic bacteria is responsible for crucifer black rot?
A) *Pseudomonas syringae*p.v.*coronafaciens*
B) *Xanthomonascampestris*p.v.*translucens*
C) *Xanthomonascampestris*p.v.*vesicatoria*
D) *Xanthomonascampestris*p.v.*campestris*

57. *Erwiniaamylovora* bacteria cause fire blight on apple and pear trees which overwinter in
A. Seed B. Stubbles
C. Margins of canker D. Soil

58. In cotton, *Xanthomonascampestris*p.v.*malvacearum* causes lesions on young stems that grow long and black, displaying disease symptoms of
A. Black leg B. Black arm
C. Black rot D. Blackfire

59. Which of the following types of bacterial exudates observed for dispersal of bacterial leaf streak pathogen (*Xanthomonasoryzae*p.v.*oryzicola*)?
A. Tendril like B. Bead like (splash)
C. Both A and B D. None of the above

60. Which *Ralstoniasolanacearum*biovar does not utilize lactose, maltose and cellobiose
A. 1 B. 2
C. 3 D. 4

61. Symptom of Black arm of cotton
A. Boll rot B. Seedling blight, angular leaf spot
C. Black arm D. All

62. Bacterial canker was first reported in India by
A. Yadav 1996 B. Patel *et al*. 1948
C. Sarmah*et al.* 1998 D. None

63. The causal organism of bacterIal blight of pomegranate produces
A. EPS B. KOH
C. Oxidase D. All.

64. Maize wilt is caused by
A. *Ralstoniasolanacearum*
B. *Pantoeastewartii* subsp. *Stewartii*
C. Both D. None

65. BBTV was first reported in India in 1940 in the state of
A. Kerala B. Karnataka
C. Tamil Nadu D. Andhra Pradesh

66. L and Y shaped crack is a characteristic symptom of
A. Bacterial blight of pomegranate B. Bacterial blight of mango
C. Bacterial blight of citrus D. None

67. The colony of *Xanthomonas* spp. is …… in colour
A. Pink B. Blue
C. Yellow D. Colourless

68. Pusa Basmati-1 is a resistant cultivar of
A. Bacterial blight B. Bacterial leaf spot
C. Bacterial streak D. None

69. Which one of the following is a non-host for *Ralstoniasolanacearum*
A. Tomato B. Potato
C. Cotton D. Chili

70. Banana bunchy top disease was first described in 1889 in
A. Mediterranean B. Sri Lanka
C. Fiji D. India

71. Select the incorrect pair
A. Tobacco mosaic disease– Adolf Mayer
B. Satellite viruses – B. Kassanis
C. Spiroplasma –Davis and Worley
D. Phytoplasma–Prusiner

72. a) Albication b) Rosetting
c) Chlorosis d) Dwarfing

Match the following
1) Severe reduction of internode growth without comparable reduction in size
2) When repression of colour is partial
3) When repression of colour is complete
4) Reduction in size with retention of propor-tionality between various organs

A. 1-d, 2-c, 3-b, 4- a B. 1-d, 2- a, 3- c, 4- b
C. 1- b, 2- c, 3- a, 4-d D. 1- b, 2-a, 3-c, 4-d

73. Select the correct pair
A. Vein banding- Tissues close to veins turns yellow and rest of the lamina remains green.
B. Vein clearing- Tissues close to veins remains green and rest of the laminaturns yellow.
C. Puckering – Pouch like development of green parts of leaves
D. Reddening – Melanin like substances are responsible

74. The downward bending of leaves or other plant parts resulting from excessive growth of the upperside of the plant
A. Epinasty B. Proliferation
C. Fasciation D. Tumefaction

75. *Spongospora subterranean* is known to transmit

A. Potato virus X B. Potato virus Y

C. Potato mop top virus D. Tobacco necrosis virus

76. The frequency of occurrence of unlike particles in the progeny of viruses

A. 0.1-0.5 % B. 0.5-2 %

C. 2-3 % D. 3-4.5 %

77.

a) Dahlia mosaic virus b) Cowpea chlorotic mottle virus

c) Peanut stunt virus d) Tobacco streak virus

e) Bean pod mottle virus

Match the following

1) Caulimovirus group 2) Comovirus group

3) Ilarvirus group 4) Cucumovirus group

5) Bromovirus group

A. 1-a, 2- e, 3- d, 4- c, 5- b B. 1-b, 2-a, 3-c, 4-e, 5-d

C. 1-d, 2-a, 3-e, 4- b, 5-c D. 1-a, 2-b, 3-c, 4-d, 5-e

78. Select the incorrect pair

A. Caulimovirus – ds DNA B. Tombusvirus – ss RNA

C. Enamovirus – ssRNA D. Potyvirus – ds RNA

79. a) Cowpea mild mottle virus

b) Papaya ringspot virus c) Papaya mosaic virus

d) Citrus tristeza e) Tomato mosaiv virus

Match the following

1) Carlavirus group 2) Closterovirus group

3) Potexvirus group 4) Potyvirus group

5) Tobamovirus group

A. 1-e, 2- d, 3- c, 4- b, 5 – a B. 1- a, 2- d, 3- c, 4- b, 5- e

C. 1-a, 2- d, 3- b, 4- c, 5- e D. 1-e, 2-d, 3- b, 4- a, 5- c

80. Tobacco leaf curl virus belongs to the group

A. Tobamovirus B. Tobravirus

C. Begomovirus D. Sobemovirus

81. Grapevine fan leaf virus, Raspberry ring spot and Tobacco ringspot virus belongs to

A. Nepovirus B. Luteovirus

C. Bromovirus D. Enamovirus

82. Clover wound tumor virus and Rice dwarf virus belongs to

A. Bromovirus B. Enamovirus

C. Reovirus D. Rhabdovirus

83. Which one of the following has elongated with rounded end (Bacilliform)

A. Reovirus B. Rhabdovirus

C. Tobravirus D. Tobamovirus

84. Which one of the following is the largest plant virus in size

A. Potyvirus B. Comovirus

C. Closterovirus D. Tombusvirus

85. a) –ssRNA, Membranous circular particle

b) +ssRNA, Isometric particle

c) ssDNA, Isometric particle

d) +ssRNA, Rigid rod shaped particle

e) –SSRNA, Thin flexous multipartite virus

Match the following

1) Begomovirus 2) Tobravirus

3) Luteovirus 4) Tospovirus

5) Tenuivirus

A. 1-c,2-d,3-b,4-a, 5- e B. 1-c,2-b,3-a,4-d, 5-e

C. 1-c,2-a,3-b, 4-e, 5-d D. 1-c,2-d, 3-a, 4-b, 5-e

86. Which of the following viruses is not transmitted by aphids

A. Cauliflower mosaic virus B. BBTV

C. Rice Tungro bacilliform virus D. Cucumber mosaic virus

87. a) Aphids b) Whitefly

c) Eriophyid mite d) Beetles

e) Plant hopper f) Thrips

Match the following

1) Rice ragged stunt virus (Oryzavirus)

2) Alfalfa mosaic virus (Alfamovirus)

3) Tomato spotted wilt virus (Tospovirus)

4) Tomato and tobacco leaf curl virus (Begomoviru)

5) Wheat streak mosaic virus (Tritimovirus)

6) Turnip yellow mosaic virus (Tymovirus)

A. 1- a, 2- b, 3- f, 4- d, 5- e, 6- c B. 1- e, 2- a, 3- f, 4- b, 5- c, 6- d

C. 1- e, 2- f, 3- a, 4- c, 5- b, 6- d D. 1- a, 2-b, 3- f, 4- c, 5- e, 6- d

88. TMV consist of how much % of RNA

A. 5 % B. 7 %

C. 10 % D. 20 %

89. Papaya ring spot virus was first reported in

A. Taiwan B. Mediterranean

C. Sri Lanka D. India

90. Citrus tristeza virus was first introduced in the 1920s in

A. Brazil B. India

C. Phillipines D. Taiwan

91. Sunflower necrosis disease (SND) was first reportedin the year 1997 in India in the state of
A. Karnataka B. MP
C. UP D. Maharashtra

92. Except the mushroom bacilliform virus, all Mycoviruses have
A. ssRNA B. dsRNA
C. ssDNA D. dsDNA

93. Sterility mosaic was first reported in India in 1932 in the state of
A. Bihar B. Karnataka
C. UP D. Madhya Pradesh

94. 'Tungro' is a Phillipine word etymologically means
A. Discolouration B. Degenerated growth
C. Reduced tiller D. Puckering

95. Begomoviruses infects
A. Only monocotyledonous plants B. Only dicotyledonous plants
C. Both a) and b) D. Homozygous plants

96. Tobacco yellow dwarf virus is transmitted by _____ and infects _____
A. *Bemesiatabaci*, Dicotyledonous hosts
B. *Orosiusargentatus*, Dicotyledonous hosts
C. *Aphis craccivora*, Monocotyledonous hosts
D. Grafting, Dicotyledonous hosts

97. Leaf curl of papaya was first reported by Thomas in 1939 from Madras and is caused by
A. Papaya leaf curl virus B. Tobacco leaf curl virus
C. Chilli leaf curl virus D. Tomato leaf curl virus

98. The vector for rice tungro virus is which of the following
A. Aphis gossypii B. Nephotettixvirescens
C. Beetle D. All of the above

99. Tomato spotted wilt virus belongs to
A. Potyvirus B. Cosmovirus
C. Tospovirus D. None of the above

100. Telomorphic stage of Blast disease of rice is
A. *Rhizoctonia solani* *B.* *Magnaporthe grisea*
C. *Telomorphiccucumeris* *D.* *Pyriculariaoryzae*

101. Early blight of potato is caused by
A. *Phytophthora infestans* *B.* *Alternaria solani*
C. *Phythophthoracolocasiae* D. None of the above

102. Blister blight of tea is caused by
A. *Exobasidiumnfestans* *B.* *Exobasidiumvexans*
C. *Cephaleurusvexans* D. None of the above

103. Anamorphic stage of *Mycospharellaarachidis* is
A. *Cercosporaarachidicola* B. *Cercosporidiumpersonata*
C. *Mycospharellaberkeleyii* D. None of the above
104. Sigatoka leaf spots of banana is caused by
A. *Mycospharellamusicola* B. *Mycospharellafijiensis*
C. Both A and B D. None
105. Causal organism of Bacterial blight of rice
A. *Xanthomonas oryzae* pv. o*ryzae*
B. *Xanthomonas oryzae* pv. o*ryzicola*
C. *Xanthomonas axonopodis* pv.c*itri*
D. *Xanthomonas compestris* pv.c*ompestris*
106. Casual organism of Citrus canker
A. *Xanthomonas compestris* pv.c*ompestris*
B. *Xanthomonas axonopodis* pv.c*itri*
C. *Xanthomonas citri* pv. p*haseoli*
D. *Xanthomonas oryzae* pv. o*ryzicola*
107. *Xanthomonas compestris* pv. malvacearum is the casual organism of
A. Fire blight of apple B. Black rot of crucifers
C. Citrus canker D. Angular leaf spot of cotton
108. Which of the following bacteria causes black rot of crucifers?
A. *Pseudomonas syringae* pv. c*oronafaciens*
B. *Xanthomonas campestris* pv. t*ranslucens*
C. *Xanthomonas campestris* pv. c*ampestris*
D. *Xanthomonas campestris* pv. *vesicatoria*
109. Which of the following is a seed borne disease?
A. Black arm or angular leaf spot of cotton
B. Bacterial blight of rice
C. Grassy shoots of sugarcane
D. All of the above
110. Black leg of potato is caused by
A. *Pectobacterium carotovorum* subsp. *carotovorum*
B. *Canditatus liberobacter*
C. *Streptomyces scabies* D. *Erwinia amylovora*
111. Fire blight of apple is caused by
A. *Streptomyces scabies* B. *Erwinia amylovora*
C. *Canditatus liberobacter* D. *Clavibacter xyli*
112. Bacterial exudates observed for dispersal of bacterial leaf streak pathogen (*Xanthomonas oryzae* pv. *oryzicola*)
A. Tendril like B. Bead like
C. Both A and B D. None of the above

113. Mechanical transmission is present in
A. *Streptomyces scabies* *B.* *Erwinia amylovora*
C. *Canditatus liberobacter* *D.* *Clavibacter xyli*

114. Psyllids is the vector of which bacteria
A. *Clavibacter xyli* *B.* *Canditatus liberobacter*
C. *Erwinia amylovora* *D.* *Xanthomonas citri* pv. *phaseoli*

115. Which of the following is a soil borne disease?
A. Soft rot B. Black rot of crucifers
C. Bacterial blight of cotton D. Bacterial blight of rice

116. Which of the following is a debris borne disease?
A. Black rot of crucifers B. Soft rot
C. Bacterial wilts of solanaceous vegetables
D. Bacterial blight of rice

117. Which of the following bacteria causes Crown gall of stone fruits?
A. *Streptomyces scabies* *B.* *Erwinia amylovora*
C. *Canditatus liberobacter* *D.* *Agrobacterium tumefaciens*

118. Which bacteria is associated with Anguina tritici to cause Yellow ear cockle of wheat?
A. *Erwinia tracheiphila* *B.* *Clavibacter tritici*
C. *Xanthomonas citri*
D. *Xanthomonas campestris* pv.*campestris*

119. Vector of Citrus canker
A. Bee B. Wasp
C. Leaf miner D. Aphids

120. Which bacterial disease enter through stomata
A. *Xanthomonas oryzae* pv. *oryzicola*
B. *Streptomyces scabies*
C. *Rhizobium* spp. *D.* *Clavibacter tritici*

121. Which bacterial disease enter through lenticels
A. *Xanthomonas oryzae* pv. *oryzicola*
B. *Rhizobium* spp.
C. *Clavibacter tritici* *D.* *Streptomyces scabies*

122. Casual organism of Common blight of bean
A. *Xanthomonas campestris* pv. *phaseoli*
B. *Clavibacter tritici*
C. *Xanthomonas citri*
D. *Xanthomonas campestris* pv. *campestris*

123. Casual organism of Bacterial blight of pomegranate
A. *Xanthomonas campestris* pv. *phaseoli*
B. *Xanthomonas axonopodis* pv. *punicae*

C. *Clavibacter tritici*
D. *Xanthomonas citri*

124. Casual organism of Halo blight of bean
A. *Pseudomonas syringae* pv. *phaseolicola*
B. *Xanthomonas campestris* pv. *phaseoli*
C. *Xanthomonas axonopodis* pv. *punicae*
D. *Clavibacter tritici*

125. Fire blight of apple and pears was discovered by
A. Robert Koch B. T.J Burrill
C. J.C Arthur D. All of the above

126. Closteroviridae are transmitted by-
A) Aphids B) Whiteflies
C) Mealy bugs D) All of them

127. Ilarvirus is transmitted by
A) Pollen B) Seed
C) Thrips D) All of them

128. Waikavirus is transmitted by-
A) Leafhoppers B) Aphids
C) Thrips D) Both (A) and (B)

129. Reoviridae are transmitted by-
A) Leafhoppers B) Plant hoppers
C) Both(A) and (B) D) Aphids

130. Geminiviridae are transmitted by-
A) Leafhoppers B) Whiteflies
C) Plant hoppers D) All of them

131. Viruses in the genera Nanovirus and Babuvirus are transmitted by-
A) Aphids B) Whiteflies
C) Leafhoppers D) None of them

132. Which of the following are/is transmitted by thrips
A) Tomato spotted wilt virus B) Tobacco streak virus
C) Tomato bushy stunt virus D) Both (A) and (B)

133. Which of the following is/are transmitted by Nematode-
A) Tobacco rattle virus B) Tobacco ring spot virus
C) Carnation ring spot virus D) All of these

134. Which of the following is/are transmitted by fungi-
A) Tobacco necrosis virus B) Potato mop-top virus
C) Both (A) and (B) D) Barley stripe mosaic virus

135. Which of the following is not a seed transmitted disease
A) Tobacco streak virus B) Tobacco rattle virus
C) Maize streak virus D) Cowpea mosaic virus

136. Tobacco mosaic virus is transmitted through
A) Seed B) Contact
C) Both A and B D) None of the above
137. Which of the following is/are aphid transmitted
A) Cucumber mosaic virus B) Banana bunchy top virus
C) Cauliflower mosaic virus D) All of them
138. Which of the following is/are Whitefly transmitted
A) Tomato leaf curl virus B) Sweet potato mild mottle virus
C) Both A and B D) None of the above
139. Wheat streak mosaic virus is transmitted by-
A) Eriophyid mites B) Aphids
C) Whiteflies D) None of the above
140. Potato virus X is transmitted by-
A) Contact B) Aphid
C) Thrips D) All of the above
141. Cowpea mosaic virus is transmitted by-
A) Beetle B) Seed
C) Both A and B D) None of the above
142. Rice tungro bacilliform virus is/are transmitted by-
A) Seed B) Mealy bug
C) Leafhoppers D) None of the above
143. Rice ragged stunt virus is transmitted by-
A) Planthoppers B) Thrips
C) Aphids D) Whitefly
144. Maize streak virus is transmitted by
A) Thrips B) Aphids
C) Whitefly D) Leafhopper
145. Barley yellow mosaic virus is transmitted by
A) Aphids B) Whitefly
C) Leafhopper D) Fungi
146. Which of the following disease3s the leaves becomes small and closely placed to form rosette like structures?
A) Little leaf of brinjal
B) Bunchy top of banana
C) Mosaic of cucurbits
D) Leaf curl of tomato
147. Grapevine fan leaf virus is transmitted by
A) Olpidium brassicae *B) Xiphinema index*
C) Nephotettix apicalis *D) Bemisia tabaci*

148. Tobacco mosaic virus is transmitted by
A) Contact + Fungi B) Whitefly
C) Leaf hopper D) Aphid

149. Give an example of insect vector which is not associated with mechanical transmission
A) Aphid B) Leaf Hopper
C) Thrips D) Mites

150. Example of viroid disease of plant
A) Chrysanthemum stunt B) Citrus trsteza
C) Bunchy top of banana D) Potato virus X

151. Example of Pecluviruses group
A) TMV B) Wheat mosaic virus
C) Peanut clump virus D) Potato virus X

152. Which group of virus is transmitted by soil borne protozoa belonging to the genus Polymyxa
A) Carlavirus B) Potexvirus
C) Furovirus D) Tobravirus

153. Family Closteroviridae is transmitted by
A) Aphids B) Mealy bugs
C) Whiteflies D) All of them

154. CTV is transmitted by
A) Toxoptera citricida *B) Aphis gossypii*
C) Budding and grafting D) All of the above

155. Which of the following is an ssRNA virus
A) Cauliflower mosaic virus B) Turnip yellow mosaic virus
C) Rice tungro spherical virus D) Both b and c

156. Potato leaf rollvirus belongs to which group of viruses
A) Polerovirus B) Luteovirus
C) Fabavirus D) Ilarvirus

157. The pathogen of Sunflower necrosis disease is antigenically associated with which virus
A) Tobacco streak virus B) TMV
C) Tobacco rattle virus D) None of the above

158. Which of the following is an example of dsRNA virus
A) Luteoviridae B) Comoviridae
C) Reoviridae D) Bromoviridae

159. Example of Fijivirus
A) Maize rough dwarf virus B) Pagola stunt virus
C) Rice black streak dwarf virus D) All of the above

160. Example of negative sense ssRNA virus

A) Strawberry crinkle virus B) Wound tumor virus

C) Tomato ringspot virus D) Potato leaf curl virus

161. Genome of Tomato spotted wilt virus

A) -ssRNA B) +ssRNA

C) -dsRNA D) +dsRNA

162. The characteristic symptom of sterility mosaic virus is

A) Stunted and pale brown appearance of plant

B) Bushy and pale green appearance of plant and drastic reduction in leaf size

C) Leaf curl and mosaic appearance

D) Yellow halo surrounded by bleack spot

163. Banana bunchy top disease was first described in 1889 in

A) India B) Mediterranean

C) Sri Lanka D) Fiji

164. Sterility mosaic was first reported in India in 1932 in the state of

A) UP B) Karnataka

C) Bihar D)Madhya Pradesh

165.Which one of the following is the largest plant virus in size

A) Potyvirus B) Comovirus

C) Closterovirus D) Tombusvirus

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7 ANSWERS: DISEASES OF CROP PLANTS

1. (Ans: C;Phakospora, Source: An Introduction to Fungi - HC Dube, Ch -14, page no 281-298)
2. (Ans: A; Rose, Source: An Introduction to Fungi - HC Dube, Ch -14, page no 281-298)
3. (Ans: A; Rust fungi, Source: An Introduction to Fungi - HC Dube, Ch -14, page no 281-298)
4. (Ans: C; *Phytophthora ramorum*, Source: An Introduction to Fungi - HC Dube, Ch -20, page no 417)
5. (Ans: A; *Peronospora destructor,* Source: An Introduction to Fungi - HC Dube , CH -20, page no 421)
6. (Ans: B; *Peronospora parasitica,* Source: An Introduction to Fungi - HC Dube, Ch -20, page no 421)
7. (Ans: B; Late blight disease, Source: An Introduction to Fungi - HC Dube, Ch -20, page no 419)
8. (Ans: B; Fungi, Source: An Introduction to Fungi - HC Dube, Ch -10, page no 153)
9. (Ans: D; Podosphaera, Source: An Introduction to Fungi - HC Dube, Ch -12, page no 217)
10. (Ans: D; Podosphaera, Source: An Introduction to Fungi - HC Dube, Ch -12, page no 217)
11. (Ans: C; Ergot of sorghum, Source: An Introduction to Fungi - HC Dube, Ch -13, page no 272)
12. (Ans: C, Barberry, Source: Fundamentals of Plant Pathology, D. Alice, C. Jeyalakshmi, Page:10)
13. (Ans: B, Thirumalachar, Source: Fundamentals of Plant Pathology, D. Alice, C. Jeyalakshmi, Page:11)
14. (Ans: C, *Rhizopus stolonifer*, Source: Fungi, Bacteria and viruses, H. C. Dube, Page: 34)
15. (Ans: D, Brewing, Baking and for making probiotic, Source: Fungi, Bacteria and viruses, H. C. Dube, Page: 48)
16. (Ans: C, *Verticillium theobromae*, Source: Fundamentals of Plant Pathology, D. Alice, C. Jeyalakshmi, Page: 234)
17. (Ans: B, *Phytophthora fragariae,* Source: Fungi, Bacteria and viruses, H. C. Dube, Page: 128)
18. (Ans: A, Rice blast, Source: Fundamentals of Plant Pathology, D. Alice, C. Jeyalakshmi, Page:143)

19. (Ans: B, *Bipolaris oryzae,* Source: Fundamentals of Plant Pathology, D. Alice, C. Jeyalakshmi, Page:135)
20. (Ans: B, BLB, Source: Fundamentals of Plant Pathology, D. Alice, C. Jeyalakshmi, Page:298)
21. (Ans: B, MERYBLYT and COUGARBLIGHT, Source: Fundamentals of Plant Pathology, D. Alice, C. Jeyalakshmi, Page:303)
22. (Ans: B, *Leifsonia xyli* subsp. *Xyli,* Source: Fundamentals of Plant Pathology, D. Alice, C. Jeyalakshmi, Page:299)
23. (Ans: A, *Ceratocystis paradoxa*, Source: Fundamentals of Plant Pathology, D. Alice, C. Jeyalakshmi, Page:138)
24. (Ans: A, Sulphur toxicity, Source: Fundamentals of Plant Pathology, D. Alice, C. Jeyalakshmi, Page:369)
25. (Ans: A, Mn, Source: Fundamentals of Plant Pathology, D. Alice, C. Jeyalakshmi, Page:369)
26. (Ans: C, *Fusarium,* Source: An introduction to Mycology, K.R. Aneja and R. S. Mehrotra, Page: 589
27. (Ans: A, Holo root parasite, Source: Fundamentals of Plant Pathology, D. Alice, C. Jeyalakshmi, Page:363)
28. (Ans: D, Autotroph, Source: Fungi, Bacteria and viruses, H. C. Dube, Page: 4)
29. (Ans: A, Ostiole, Source: An introduction to Mycology, K.R. Aneja and R. S. Mehrotra, Page: 166)
30. (Ans: D, Darjeeling, Source: Fundamentals of Plant Pathology, D. Alice, C. Jeyalakshmi, Page:10)
31. (Ans: A, *Tolyposporium penicilliariae,* Source: Fundamentals of Plant Pathology, D. Alice, C. Jeyalakshmi, Page: 272)
32. (Ans: A, Quarantine, Source: Principle of Plant Pathology, RS Singh, Page No. 301)
33. (Ans: C, Reducing the quantity of yield, Source: Principle of Plant Pathology, RS Singh, Page No. 50)
34. (Ans: A, Albinism, Source: Principle of Plant Pathology, RS Singh, Page No. 42)
35. (Ans: B, Hyperplasia, Source: Principle of Plant Pathology, RS Singh, Page No. 42)
36. (Ans: B, *Anguina tritici,* Source: Plant Pathology, GN Agrios, Page No: 866)
37. (Ans: D, Increase the flowering period, Source: Principle of Plant Pathology, RS Singh, Page No. 50)
38. (Ans: A, *Meloidogyne incognita,* Source: Plant Pathology, GN Agrios, Page No: 24)
39. (Ans: B, *Fusarium udum,* Source: Plant Pathology, GN Agrios, Page No: 24)
40. (Ans: A) *Albugo*
41. (Ans: C) *Peronospora*
42. (Ans: D, *Synchytrium endobioticum,* Source: Plant Pathology, GN Agrios)

43. (Ans: B, Polyporus, Source: Plant Pathology, GN Agrios, Page No: 606)
44. (Ans: C, Soil borne, Source: Plant Pathology, GN Agrios, Page No: 386)
45. (Ans: A, Zn, Source: Plant Pathology, GN Agrios, Page No: 373)
46. (Ans: C, 30-32^{0}C)
47. (Ans: D, Red rot of sugarcane- *Colletotrichum gleosporoides,* Source: Plant Pathology, GN Agrios, Page No: 203)
48. (Ans: B, Basidiomycotina, Source: Plant Pathology, GN Agrios, Page No: 282)
49. (Ans: A, Systemic infection, Source: Principle of Plant Pathology, RS Singh, Page No. 11)
50. (Ans: B, *Rhizobacter daucus*, Source: Plant Bacteriology by Kalyan K. Mondal Page No-71)
51. (Ans: D, all of the above, Source: Plant Bacteriology by Kalyan K. Mondal Page No-73)
52. (Ans: C, *Erwinia carotovora,* Source: Plant Bacteriology by Kalyan K. Mondal Page No-71)
53. (Ans: A, *Pseudomonas andropogonis,* Source: Plant Bacteriology by Kalyan K.Mondal Page No-71)
54. (Ans: D, All of the above, Source: Plant Bacteriology by Kalyan K. Mondal Page N
55. (Ans: A, *Pseudomonas syringae* pv. *persicae,* Source: Plant Bacteriology by Kalyan K. Mondal Page No-74)
56. (Ans: D, *Xanthomonas campestris* pv. *Campestris,* Source: Plant Bacteriology by Kalyan K. Mondal Page No-71)
57. (Ans: C, Margin of canker, Source: Plant Bacteriology by Kalyan K. Mondal Page No-77)
58. (Ans: B, Black arm, Source: Plant Bacteriology by Kalyan K. Mondal Page No-71)
59. (Ans: C, Both A and B, Source: Plant Bacteriology by Kalyan K. Mondal Page No-71)
60. (Ans: A, 1, Source: Plant Bacteriology by Kalyan K. Mondal Page No-119)
61. (Ans: D, All, Source: Plant Bacteriology by Kalyan K. Mondal Page No-120)
62. (Ans: B, Patel *et al.,* 1948, Source: Plant Bacteriology by Kalyan K. Mondal Page No-117)
63. (Ans: D, All, Source: Plant Bacteriology by Kalyan K. Mondal Page No-116)
64. (Ans: D, None, Source: Plant Bacteriology by Kalyan K. Mondal Page No-114)
65. (Ans: A, Kerela, Source: Elements of plant virology, Page 161)
66. (Ans: A, Bacterial blight of pomegranate, Source: Plant Bacteriology by Kalyan K. Mondal Page No-116)
67. (Ans: C, Yellow, Source: Plant Bacteriology by Kalyan K. Mondal Page No-115)
68. (Ans: A, Bacterial blight, Source: Plant Bacteriology by Kalyan K. Mondal Page No-115)
69. (Ans: C, Cotton, Source: Plant Bacteriology by Kalyan K. Mondal Page No-120)

70. (Ans: C, Fiji, Source: Elements of plant virology, Page– 10)
71. (Ans: D, Phytoplasma- Prusiner, Source: Elements of plant virology, Pg – 27)
72. (Ans: C, 1-b, 2-c, 3-a, 4-d, Source: Elements of plant virology, Pg – 32)
73. (Ans: C, Puckering-Pouch like development of green parts of leaves, Source: Elements of plant virology, Pg – 32-34)
74. (Ans: A, Epinasty, Source: Elements of plant virology, Page – 36)
75. (Ans: C, Potato mop top virus, Source: Elements of plant virology, Page 60)
76. (Ans: B, 0.5-2%, Source: Elements of plant virology, Page 63)
77. (Ans: A, 1-a, 2-e, 3-d, 4-c, 5-b, Source: Elements of plant virology, Page 124)
78. (Ans: D, Potyvirus-dsRNA, Source: Elements of plant virology, Page 124)
79. (Ans: B, 1-a, 2-d, 3-c, 4-b, 5-e, Source: Elements of plant virology, Page 125-126)
80. (Ans: C, Begomovirus, Source: Elements of plant virology, Page 134)
81. (Ans: A, Nepovirus, Source: Elements of plant virology, Page 124)
82. (Ans: C, Reovirus, Source: Elements of plant virology, Page 126)
83. (Ans: B, Rhabdovirus, Source: Elements of plant virology, Page 130)
84. (Ans: C, Closterovirus, Source: Elements of plant virology, Page 130)
85. (Ans: A, 1-c, 2-d, 3-b, 4-a, 5-e, Source: Elements of plant virology, Page 130-134)
86. (Ans: C, Rice Tungro bacilliform virus, Source: Elements of plant virology, Page 130-134)
87. (Ans: B, 1-e, 2-a, 3-f, 4-b, 5-c, 6-d, Source: Elements of plant virology, Page 130-134)
88. (Ans: A, 5%, Source: G.N.Agrios, Page 757)
89. (Ans: A, Taiwan, Source: Elements of plant virology, Page 212)
90. (Ans:A, Brazil , Source: Elements of plant virology, Page 212)
91. (Ans: A, Karnataka, Source: Elements of plant virology, Page 151)
92. (Ans: B, dsRNA, Source: Elements of plant virology, Page 154)
93. (Ans: A, Bihar, Source: Elements of plant virology, Page 156)
94. (Ans: B, Degenerated growth, Source: Elements of plant virology, Page 158)
95. (Ans: B, Only dicotyledonous plants, Source: Elements of plant virology, Page 158)
96. (Ans: B, *Orosius argentatus,* Dicotyledonous hosts, Source: Elements of plant virology, Page 159)
97. (Ans: B, Tobacco Leaf Curl Virus, Source: Elements of plant virology, Page 160)
98. (Ans: B, *Nephotettix virescens,* Source: Modern plant pathology by H.C Dube pg.no 349)
99. (Ans: C, Tospovirus, Source: Modern plant pathology by H.C Dube pg.no 351)
100. (Ans: B, *Magnaporthe grisea,* Source: Modern plant pathology by H.C Dube pg.no 298).

101. (Ans: B, *Alternaria solani,* Source: Modern plant pathology by H.C Dube pg.no 313).
102. (Ans: B, *Exobasidium vexans,* Source: Modern plant pathology by H.C Dube pg.no 326).
103. (Ans: A, *Cercospora arachidicola,* Source: Modern plant pathology by H.C Dube pg.no 328)
104. (Ans: C, Both A and B, Source: Modern plant pathology by H.C Dube pg.no 331)
105. Ans:A. *Xanthomonas oryzae* pv. *Oryzae,* Source: Plant Bacteriology by Kalyan K. Mondal Page No-71
106. Ans:B. *Xanthomonas axonopodis* pv.c*itri*, Source: Plant Bacteriology by Kalyan K. Mondal Page No-71
107. Ans:D. Angular leaf spot of cotton, Source: Plant Bacteriology by Kalyan K. Mondal Page No-71
108. Ans:C. *Xanthomonas campestris* pv. c*ampestris*, Source: Plant Bacteriology by Kalyan K. Mondal Page No-71
109. Ans:D. All of the above, Source: Plant Bacteriology by Kalyan K. Mondal Page No-73
110. Ans:A. *Pectobacterium carotovorum* subsp. *carotovorum*, Source: Plant Bacteriology by Kalyan K. Mondal Page No-74
111. Ans: B. *Erwinia amylovora*, Source: Plant Bacteriology by Kalyan K. Mondal Page No-71
112. Ans: C. Both A and B, Source: Plant Bacteriology by Kalyan K. Mondal Page No-71
113. Ans: D. *Clavibacter xyli*, Source: A competitive book of agriculture by Nemraj Sunda Page No-305
114. Ans: B. *Canditatus liberobacter*, Source: A competitive book of agriculture by Nemraj Sunda Page No-304
115. Ans: A. Soft Rot, Source: Plant Bacteriology by Kalyan K. Mondal Page No-77
116. Ans: D. Bacterial Blight of Rice, Source: Plant Bacteriology by Kalyan K. Mondal Page No-77
117. Ans: D. *Agrobacterium tumefaciens*, Source: Plant Bacteriology by Kalyan K. Mondal Page No-71
118. Ans: B. *Clavibacter tritici*, Source: Plant Bacteriology by Kalyan K. Mondal Page No-74
119. Ans: C. Leaf miner, Source: Plant Bacteriology by Kalyan K. Mondal Page No-73
120. Ans: A. *Xanthomonas oryzae* pv. *oryzicola*, Source: Plant Bacteriology by Kalyan K. Mondal Page No-71
121. Ans: D. *Streptomyces scabies*, Source: Plant Bacteriology by Kalyan K. Mondal Page No-71

122. Ans: A. *Xanthomonas campestris* pv. *phaseoli*, Source: Plant Bacteriology by Kalyan K. Mondal Page No-78
123. Ans: B. *Xanthomonas axonopodis* pv. *punicae*, Source: Plant Bacteriology by Kalyan K. Mondal Page No-78
124. Ans: A. *Pseudomonas syringae* pv. *phaseolicola*, Source: Plant Bacteriology by Kalyan K. Mondal Page No-74
125. Ans: B. T.J Burrill, Source: Modern plant pathology by H.C Dube pg.no 336
126. (Ans: D. All of them, Source: The elements of Plant Virology by Kolte and Tewari, Page No-131)
127. (Ans: D. All of them, Source: The elements of Plant Virology by Kolte and Tewari, Page No-132)
128. (Ans: D. Both A and B, Source: The elements of Plant Virology by Kolte and Tewari, Page No-132)
129. (Ans: C. Both A and B, Source: The elements of Plant Virology by Kolte and Tewari, Page No-133)
130. (Ans: D. All of them,Source: The elements of Plant Virology by Kolte and Tewari, Page No-133)
131. (Ans: A. Aphids, Source: The elements of Plant Virology by Kolte and Tewari, Page No-134)
132. (Ans: D. Both A and B, Source: The elements of Plant Virology by Kolte and Tewari, Page No-133)
133. (Ans: D. All of them, Source: The elements of Plant Virology by Kolte and Tewari, Page No-130-132)
134. (Ans: C. Both A and B, Source: The elements of Plant Virology by Kolte and Tewari, Page No-130)
135. (Ans: C. Maize streak virus,Source: The elements of Plant Virology by Kolte and Tewari, Page No-130)
136. (Ans: C. Both A and B, Source: The elements of Plant Virology by Kolte and Tewari, Page No-130)
137. (Ans: D. All of them, Source: The elements of Plant Virology by Kolte and Tewari, Page No-130-134)
138. (Ans: C. Both A and B,Source: The elements of Plant Virology by Kolte and Tewari, Page No-133-134)
139. (Ans: A. Eriophyid mites, Source: The elements of Plant Virology by Kolte and Tewari, Page No-131)
140. (Ans: A. Contact,Source: The elements of Plant Virology by Kolte and Tewari, Page No-131)
141. (Ans: C. Both A and B, Source: The elements of Plant Virology by Kolte and Tewari, Page No-132)
142. (Ans: C. Leafhoppers,Source: The elements of Plant Virology by Kolte and Tewari, Page No-134)

143. (Ans: A. Planthoppers,Source: The elements of Plant Virology by Kolte and Tewari, Page No-133)
144. (Ans: D. Leafhopper,Source: The elements of Plant Virology by Kolte and Tewari, Page No-133)
145. (Ans: D. Fungi, Source: The elements of Plant Virology by Kolte and Tewari, Page No-131)
146. Ans: A. Little leaf of brinjal Source: Fungi, Bacteria and viruses by HC Dube, Pg: 254
147. Ans: B. *Xiphinema index*, Source: Fungi, Bacteria and viruses by HC Dube, Pg: 256
148. Ans: A. Contact + Fungi, Source: Fungi, Bacteria and viruses by HC Dube, Pg: 256
149. Ans: B. Leaf hopper, Source: Fungi, Bacteria and viruses by HC Dube, Pg:256
150. Ans : A. Chrysanthemum stunt, Source: Fungi, Bacteria and viruses by HC Dube, Pg:256
151. Ans : C. Peanut clump virus, Source: Elements of plant virology, pg: 139
152. Ans : C. Furovirus, Source: Elements of plant virology, pg: 139
153. Ans: D. All of them, Source: Elements of plant virology, pg: 144
154. Ans: D. All of them, Source: Elements of plant virology, pg: 144
155. Ans: D. Both B and C, Source: Elements of plant virology, pg: 145
156. Ans : B. Luteovirus, Source: Elements of plant virology, pg: 147
157. Ans : A. Tobacco streak virus, Source: Elements of plant virology, pg: 151
158. Ans : C. Reoviridae, Source: Elements of plant virology, pg: 152
159. Ans: D. All of them, Source: Elements of plant virology, pg: 153
160. Ans : A. Strawberry crinkle virus, Source: Elements of plant virology, pg: 154
161. Ans: A. –ssRNA, Source: Elements of plant virology, pg: 155
162. Ans: B. Bushy and pale green appearance of plant and drastic reduction in leaf size, Source: Elements of plant virology, pg: 156
163. Ans: D. Fiji, Source: Elements of plant virology, Page – 10
164. Ans: C. Bihar, Source: Elements of plant virology, Page 156
165. Ans: C. Closterovirus, Source: Elements of plant virology, Page 130

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CHAPTER 8
FUNGICIDES AND CHEMICAL CONTROL OF PLANT DISEASES

1. Which of the following is an acetamide fungicide
   A. Metalaxyl B. Furalaxyl
   C. Biloxazol D. Curzate
2. _____ is particularly effective against deep seated basidiomycetes infecting seeds such as loose smut of wheat & barley and as such is the first truly synthetic systemic to be used in agriculture as a seed dresser for smuts
   A. Benomyl B. Carbendazim
   C. Carboxin D. Oxycarboxin
3. Which of the following is/are a first generation fungicide(s)
   A. Sulphur B. Copper
   C. Mercury D. All of them
4. The discovery of _____ around 1934 marked beginning of the development of highly effective and specific second generation fungicides that are organic in nature
   A. Thalimides B. Acetamides
   C. Dithiocarbamates D. All of them
   E.
5. _____ are also termed as systemic fungicides and possess direct and indirect activity on the pathogen
   A. First generation compounds B. Second generation compounds
   C. Third generation compounds D. All of them
6. Benomyl is chemically _____
   A. Methyl-1-(butyl carbamoyl)-2-benzimidazole carbamate
   B. Methyl-2-(butyl carbamoyl)-2-benzimidazole carbamate
   C. Methyl-1-(butyl carbamoyl)-1-benzimidazole carbamate
   D. Methyl-2-(butyl carbamoyl)-1-benzimidazole carbamate
7. _____are converted to an active fungitoxicant Methyl Benzimidazole Carbamate (MBC) before reaching their site of action in the fungal cells
   A. Benomyl B. Thiophanate-methyl
   C. Both of them D. None of them

8. Mepronil is sold with the name
   A. Plantvax B. Calirus
   C. Basitac D. Moncut
9. Which of the following is a Sterol Inhibiting Fungicide (SBI)
   A. Triazoles B. Morpholines
   C. Pyrimidines D. All of the above
10. _____interferes with the activity of RNA Polymerase I
   A. Carbamates B. Phenylamides
   C. Acylalanins D. None of them
11. _____ acts synergistically with Metalaxyl
   A. Fosetyl Al B. Furalaxyl
   C. Cymoxanil D. Curzate
12. Chloranil (quinone derivatives) has now been replaced by _____
   A. Diazoben B. Dichlone
   C. Dichloran D. None
13. Carboxin and Oxycarboxin was first introduced in the year
   A. 1964 B. 1965
   C. 1966 D. 1967
14. The first Ethylene-bis-Dithiocarbamates (EBDC) to be developed was
   A. Nabam B. Zineb
   C. Maneb D. Mancozeb
15. Chlorothalonil is sold as
   A. Daconil B. Bravo
   C. Termil D. All of them
16. Chemotherapeutic fungicides are _____fungicides that are somewhat mobile in the plant
   A. Contact B. Systemic
   C. Both D. None
17. _____were the first synthetic site specific fungicides
   A. Benzimidazoles B. Strobilurins
   C. Sterol Biosynthesis Inhibitors (SBIs)
   D. Phenylamides
18. When a fungus develops resistance against one member of a fungicide group, it automatically becomes resistant to rest of the fungicides of that group. This type of resistance is called as
   A. Cross resistance B. Positive cross resistance
   C. Negative cross resistance D. Multiple resistance
19. Azoxystrobin moves _____in the plant
   A. Translaminarly B. Systemically
   C. Both translaminarly and systemically
   D. Neither way

20. _____ was the first enantiomer fungicide introduced in 1977
    A. Curzate B. Metalaxyl M
    C. Cymoxanil D. None
21. What is the composition of Bordeaux mixture?
    A. Copper sulphate: Lime: Water (4,4,50)
    B. Copper sulphate: Lime: Water(5,5,50)
    C. Copper carbonate: Lime: Water (4,4,50)
    D. None of the above
22. What is the composition of Burgandy mixture?
    A. Copper sulphate (1.8 kg): Sodium carbonate (2.3 kg): Water (227 L)
    B. Copper sulphate (1.8 kg): Sodium chloride (2.3 kg): Water (227 L)
    C. Copper sulphate (1.8 kg): Ammonium carbonate (2.3 kg): Water (227 L)
    D. None of the above
23. Which of the following is inorganic fungicide?
    A. Boric acid B. Bleaching powder
    C. Potassium iodide D. All the above
24. Which of the following belong to monoalkyldithiocarbamate?
    A. Maneb B. Zineb
    C. Nabam D. All the above
25. Which of the following belong to dialkyldithiocarbamate?
    A. Thiram B. Febam
    C. Zeram D. All the above
26. Which of the following fungicide is effective against Powdery mildews?
    A. Dinocarp B. Binapacryl
    C. Both A and B D. None
27. What is the mode of action of aromatic hydrocarbons against seed and soil borne diseases?
    A. Uncouple oxidative phosphorylation
    B. Cause membrane dysfunction in fungi
    C. Inhibit adenosine deaminase
    D. Inhibit r RNA synthesis
28. What is the mode of action of Oxathiins against smuts and rusts?
    A. Inhibit succinate dehydrogenase activity and disrupt respiration
    B. Cause membrane dysfunction in fungi
    C. Inhibit adenosine deaminase
    D. Inhibit r RNA synthesis
29. What is the mode of action of Benzimidazoles?
    A. Inhibit succinate dehydrogenase activity and disrupt respiration
    B. Cause membrane dysfunction in fungi
    C. Inhibit r RNA synthesis
    D. Inhibit fungal mitosis by interfering with spindle formation

30. Which of the following fungicide group is highly effective against powdery mildews?
A. Hydroxypyrimidines B. Oxathiins
C. Dinocarp D. Phenylamides
31. What is the mode of action of Phenylamides?
A. Cause membrane dysfunction in fungi
B. Inhibit rRNA synthesis
C. Inhibit fungal mitosis by interfering with spindle formation
D. Inhibit DNA and cell wall synthesis
32. Which of the following group of fungicide is effective against oomycetes?
A. Phenylamides B. Isoxazoles
C. Sterol Biosynthesis Inhibitors D. Both A and B
33. What is the mode of action of Sterol Biosynthesis Inhibitors against Blast of rice?
A. Inhibit melanin biosynthesis
B. Cause membrane dysfunction in fungi
C. Inhibit rRNA synthesis
D. Inhibit fungal mitosis by interfering with spindle formation
34. What is the mode of action of Strobilurins against fungi and oomycetes?
A. Block electron transport at quinol (Qo) site of oxidation and inhibit ATP synthesis
B. Inhibit melanin biosynthesis
C. Cause membrane dysfunction in fungi
D. Inhibit rRNA synthesis
35. What is the mode of action of Phenylpyrroles?
A. Inhibit glucose phosphorylation
B. Inhibit melanin biosynthesis
C. Cause membrane dysfunction in fungi
D. Inhibit rRNA synthesis
36. Bordeaux mixture was first used to control-
A. Downy mildew of grape vine B. Powdery mildew of pea
C. Root rot of beet D. None
37. Select the systemic fungicides-
A. Triazoles B. Pyrimidines
C. Metalaxyl D. All of these
38. Which is most recent widely used fungicide for control of powdery mildew?
A. Calaxin B. Sulphur dust
C. Apron-SD-35 D. Dithan M-45
39. Systemic organic compounds are effective chemicals for controlling-
A. Internally seed born disease B. Externally seed borne disease
C. Soil borne disease D. Both A and B

40. Example of system organic compound-
A. Plantvax B. Vitavax
C. Benlate D. All of these
41. Select the common copper fungicide-
A. Blitox B. Perenox
C. Captn D. Both A and B
42. Loose smut of wheat can be controlled by application of-
A. Carboxin @2.5g/kg of seed
B. Copper oxychloride @2g/kg of seed
C. Carbendazim @1g/kg of seed
D. All of these
43. Most widely used fungicide for control of smut is-
A. Plantvax B. Vitavax
C. Metalaxyl D. All of these
44. Most widely used fungicide for control of rust is-
A. Plantvax B. Vitavax
C. Benlate D. Bavistin
45. Sulphur dust is used to control-
A. Powdery mildew B. Downy mildew
C. Rust
46. Burgundy mixture was discovered by-
A. Mason, 1887 B. P. M. A. Millardet, 1885
C. Prevost 1807 D. V B Singh, 1942
47. Chaubattia paste is a combination of copper carbonate, red lead and
A. Sodium carbonate B. Copper sulphate
C. Raw linseed oil D. All of these
48. Select the Dithiocarbamate fungicide:
A. Thiram B. Zineb
C. Mancozeb D. All of these
49. Select the fungicide which also act as nematicide and herbicide-
A. Zineb B. Maneb
C. Mancozeb D. Vapam
50. Who discovered the first systemic fungicide?
A. Von Schmeling and Kulka, 1966 B. PMA Millardet, 1885
C. V. B. Singh, 1942 D. None
51. Trade name of carboxin is-
A. Vitavax B. Plantvax
C. Copper oxychloride D. Zineb

52. The groups of systemic fungicide which require specific action between the chemical inhibitor and fungal target site
    A. Benzimidazoles and Strobulin related fungicides
    B. Benzimidazoles and Sterol demethylation inhibitors
    C. Sterol demethylation inhibitors and Strobulin related fungicides
    D. All of the above
53. Lime is added to the active chemical of fungicides as a
    A. Sticker B. Surfactant
    C. Safener D. All of the above
54. Systemic fungicides were 1st available from the year
    A. 1970 B. 2005
    C. 2000 D. 1880
55. Permanent Tree wound dressing is done with
    A. 10:2:2 mixture of lanoline, rosin, gum
    B. 2:10:2 mixture of lanoline, rosin, gum
    C. 2:2:10 mixture of lanoline, rosin, gum
    D. 1:2:2 mixture of lanoline, rosin, gum
56. Chemicals widely used for post harvest control of diseases
    A. Benomyl and captan
    B. Sulfur dioxide and elemental sulfur
    C. Benzoic acid and thiabendazole
    D. All of the above
57. The Bordeaux mixture, is named after
    A. The person who discovered it
    B. The chemical used in the mixture
    C. The region where it was discovered
    D. The disease it was used against for the first time
58. The first inorganic fungicide developed was
    A. Sulfur fungicide B. Copper fungicide
    C. Carbonate fungicide D. Phosphonate fungicide
59. Chemical compounds that act as plant defense activators in host are
    A. Salicyclic acid B. Isonicotinic acid
    C. Phenolic acid D. All of the above
60. The phytotoxicity of Bordeaux mixture can be reduced by
    A. Increasing the ratio of hydrated lime to copper sulfate
    B. Increasing the ratio of copper sulfate tohydrated lime
    C. Decreasing the ratio of hydrated lime to copper sulfate
    D. Decreasing the ratio of copper sulfate tohydrated lime
61. Mode of action of the fungicide Thiram is
    A. Inhibition of electron transport chain in mitochondria

B. Inhibition of enzymes in Kreb's cycle
C. Inhibition of nucleic acids
D. Inhibition of strobulin inhibitors

62. The four disease control principles given by H.H. Whetzel in 1929 are
A. Exclusion, Eradication, Protection, Resistance
B. Exclusion, Eradication, Protection, Therapy
C. Exclusion, Avoidance, Protection, Therapy
D. Exclusion, Avoidance, Protection, Resistance

63. First systemic and broad spectrum fungicide
A. Benzimidazole B. Triazole
C. Metalaxyl D. Fosteyl Al

64. 4th generation fungicide includes (1991-2000)
A. Protectant and contact
B. Systemic and site specific
C. Systemic, site specific and broad spectrum
D. Novel modes of action, site specific and broad spectrum

65. First systemic site specific fungicide
A. Benzimidazole B. Strobilurins
C. Metalaxyl D. Fosteyl Al

66. Which of the following sentences are not true regarding the fungicide Metalaxyl
A. It was developed in 1977 against downy mildew
B. It is the first enantiomeric fungicide introduced
C. It is not biodegradable and environmentally safe
D. It is readily taken up by plants and highly mobile inside the plant

67. Resistance developed bya pathogen suddenly against fungicide with single site of action
A. Qualitative resistance B. Quantitative resistance
C. Re-esixtance resistance D. Cross resistance

68. The fungicide Azoxystrobin moves in the plant by
A. Systemic movement B. Translaminarly
C. None of the above D. Both a and b

69. The first systemic fungicide against oomycetes is
A. Metalaxyl B. Triazoles
C. Strobilurin D. Benlate

70. Five ABC (ATP binding cassette) that pumps out toxic chemical is reported in
A. Mycosphaerellagraminicola *B. Puccinia graminis*
C. Ustillagotritici *D. Ustillago maydis*

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CHAPTER 8
FUNGICIDES AND CHEMICAL CONTROL OF PLANT DISEASES

1. **Ans: D**, Curzate, Source: Systemic fungicides; Author: S C Vyas; Page No: 43]
2. **Ans: C**, Carboxin Source: Systemic fungicides; Author: S C Vyas; Page No: 7]
3. **Ans: D**, All of them, Source: Systemic fungicides; Author: S C Vyas; Page No: 11]
4. **Ans: C**, Dithiocarbamates, Source: Systemic fungicides; Author: S C Vyas; Page No: 11]
5. **Ans: C**, Third generation compounds, Source: Systemic fungicides; Author: S C Vyas; Page No: 11]
6. **Ans: A**, Methyl-1-(butyl carbamoyl)-2-benzimidazole carbamate, Source: Systemic fungicides; Author: S C Vyas; Page No: 68]
7. **Ans: C**, Both of them, Source: Systemic fungicides; Author: S C Vyas; Page No: 310]
8. **Ans: C**, Basitac, Source: Crop Diseases and Their Management; Author: Chaube & Pundhir; Page No: 299]
9. **Ans: D**, All of the above, Source: Crop Diseases and Their Management; Author: Chaube & Pundhir; Page No: 302]
10. **Ans: B**, Phenylamides, Source: Crop Diseases and Their Management; Author: Chaube & Pundhir; Page No: 296]
11. **Ans: C**, Cymoxanil, Source: Crop Diseases and Their Management; Author: Chaube & Pundhir; Page No: 296]
12. **Ans: B**, Dichlone, Source: Crop Diseases and Their Management; Author: Chaube & Pundhir; Page No: 294]
13. **Ans: C**, 1966, Source: Crop Diseases and Their Management; Author: Chaube & Pundhir; Page No: 299]
14. **Ans: A**, Nabam, Source: Crop Diseases and Their Management; Author: Chaube & Pundhir; Page No: 293]
15. **Ans: D**, All of them, Source: Crop Diseases and Their Management; Author: Chaube & Pundhir; Page No: 295]
16. **Ans: B**, Systemic, Source: Modern Plant Pathology; Author: H C Dube; Page No: 273]
17. **Ans: B**, Strobilurins, Source: Modern Plant Pathology; Author: H C Dube; Page No: 274]

18. **Ans: A**, Cross resistance, Source: Modern Plant Pathology; Author: H C Dube; Page No: 277

19. **Ans: C**, Both translaminarly and systemically, Source: Modern Plant Pathology; Author: H C Dube; Page No: 274

20. **Ans: B**, Metalaxyl M, Source: Modern Plant Pathology; Author: H C Dube; Page No: 289

21. **Ans: A,** Copper sulphate: Lime: Water (4,4,50)**,** Source: HC Dube: Modern Plant Pathology, page: 286

22. **Ans: A,** Copper sulphate (1.8 kg): Sodium carbonate (2.3 kg): Water (227 L)**,** Source: HC Dube: Modern Plant Pathology, page: 286

23. **Ans: D,** All the above**,** Source: HC Dube: Modern Plant Pathology, page: 287

24. **Ans: D,** All the above**,** Source: HC Dube: Modern Plant Pathology, page: 294

25. **Ans: D,** All the above, Source: HC Dube: Modern Plant Pathology, page: 294

26. **Ans: C,** Both A and B**,** Source: HC Dube: Modern Plant Pathology, page: 294

27. **Ans: B,** Cause membrane dysfunction in fungi, Source: HC Dube: Modern Plant Pathology, page: 294

28. **Ans: A,** Inhibit succinate dehydrogenase activity and disrupt respiration**,** Source: HC Dube: Modern Plant Pathology, page: 294

29. **Ans: D,** Inhibit fungal mitosis by interfering with spindle formation, Source: HC Dube: Modern Plant Pathology, page: 294

30. **Ans: A,** Hydroxypyrimidines**,** Source: HC Dube: Modern Plant Pathology, page: 294

31. **Ans: B,** Inhibit rRNA synthesis **,** Source: HC Dube: Modern Plant Pathology, page: 294

32. **Ans: D,** Both A and B**,** Source: HC Dube: Modern Plant Pathology, page: 294

33. **Ans: A,** Inhibit melanin biosynthesis**,** Source: HC Dube: Modern Plant Pathology, page: 294

34. **Ans: A,** Block electron transport at quinol (Qo) site of oxidation and inhibit ATP synthesis**,** Source: HC Dube: Modern Plant Pathology, page: 295

35. **Ans: A,** Inhibit glucose phosphorylation**,** Source: HC Dube: Modern Plant Pathology, page: 295

36. **Ans: A**, Downy mildew of grape vine, Source: R. K. Sharma, B. B. Singh, Agriculture at a glance, Page no: 377

37. **Ans: D**, All of these, Source: R. K. Sharma, B. B. Singh, Agriculture at a glance, Page no: 377

38. **Ans: A**, Calaxin , Source: R. K. Sharma, B. B. Singh, Agriculture at a glance, Page no: 378

39. **Ans: D**, Both A and B, Source: R. K. Sharma, B. B. Singh, Agriculture at a glance, Page no: 378

40. **Ans: D**, All of these , Source: R. K. Sharma, B. B. Singh, Agriculture at a glance, Page no: 379

41. **Ans: D**, Both A and B, Source: H. C. Dune, Modern plant pathology, Page no: 284
42. **Ans: A**, Carboxin @2.5g/kg of seed, Source: H. C. Dune, Modern plant pathology, Page no: 284
43. **Ans: B**, Vitavax, Source: H. C. Dune, Modern plant pathology, Page no: 285
44. **Ans: A**, Plantvax, Source: H. C. Dune, Modern plant pathology, Page no: 285
45. **Ans: A**, Powdery mildew, Source: H. C. Dune, Modern plant pathology, Page no: 285
46. **Ans: A**, Mason, 1887, Source: H. C. Dune, Modern plant pathology, Page no: 286
47. **Ans: C**, Raw linseed oil, Source: H. C. Dune, Modern plant pathology, Page no: 286
48. **Ans: D**, All of these, Source: H. C. Dune, Modern plant pathology, Page no: 286
49. **Ans: D**, Vapam, Source: H. C. Dune, Modern plant pathology, Page no: 288
50. **Ans: A**, Von Schmeling and Kulka, 1966, Source: H. C. Dune, Modern plant pathology, Page no: 289
51. **Ans: A**, Vitavax , Source: H. C. Dune, Modern plant pathology, Page no: 290
52. **Ans**: **B**, Benzimidazoles and Sterol demethylation inhibitors, Book: G.N. Agrios, page no: 331
53. **Ans**: **C**, Safener , Book: G.N. Agrios, page no: 334
54. **Ans**: **A**, 1970 , Book: G.N. Agrios, page no: 334
55. **Ans**: **A**, 10:2:2 mixture of lanoline, rosin, gum, Book: G.N. Agrios, page no: 337
56. **Ans**: **D**, All of the above, Book: G.N. Agrios, page no: 338
57. **Ans**: **C**, The region where it was discovered, Book: G.N. Agrios, page no: 338
58. **Ans**: B, Copper fungicide, Book: G.N. Agrios, page no: 338
59. **Ans**: D, All of the above, Book: G.N. Agrios, page no: 338
60. **Ans**: A, Increasing the ratio of hydrated lime to copper sulfate, Book: G.N. Agrios, page no: 338
61. **Ans**: B, Inhibition of enzymes in Kreb's cycle, Book H. C. Dube page 294
62. **Ans**: B, Exclusion, Eradication, Protection, Therapy, Dr. Robin Gogoi class
63. **Ans**: A, Benzimidazole , Dr. Robin Gogoi class
64. **Ans**: D, Novel modes of action, site specific and broad spectrum, Dr. Robin Gogoi class
65. **Ans**: B, Strobilurins , Book H. C. Dube page 290
66. **Ans**: C, It is not biodegradable and environmentally safe, Book H. C. Dube page 276
67. **Ans**: A, Qualitative resistance, Book H. C. Dube page 276
68. **Ans**: D, Both a and b , Book H. C. Dube page 274
69. **Ans**: A, Metalaxyl , Dr. Robin Gogoi class
70. **Ans**: A, *Mycosphaerella graminicola* , Book H. C. Dube page 277

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CHAPTER 9
BIOLOGICAL CONTROL OF PLANT DISEASES

1. Water melon variety that allows the buildup of antagonistic species against *Fusarium* wilt is:
   A. Crimson sweet B. Sugar baby
   C. Arka manik D. Black magic
2. The fact that suppressiveness of suppressive soil is due to antagonistic microflora can be tested by
   A. Pasteurization of the soil at 60ºC for 30 mins
   B. Pasteurization of the soil at 90ºC for 60 mins
   C. Pasteurization of the soil at 60ºC for 90 mins
   D. Pasteurization of the soil at 60ºC for 60 mins
3. The crop family that develops a sort of "soil suppressiveness" for the next crop in the cropping pattern
   A. Crucifereceae B. Leguniminaceae
   C. Solanaceae D. Fabaceae
4. Root knot nematode are trapped by
   A. Crotalaria B. Black nightshade
   C. Cereal crops D. Beans
5. Plant that are antagonistic to nematodes by secreting toxic substances
   A. Marigold B. Asparagus
   C. Both a and b D. Neither a nor b
6. The first bacterium used as Biocontrol agent
   A. *Pseudomonas fluorescens* B. *Bacillus subtilis*
   C. *Bacillus thureinginsis* D. *Rhizobium radiobacter*
7. Hypovirulence due to transfer of double stranded RNA mycovirus was first discovered naturally heally cankers of Chestnut trees while identifying the
   A. Virulent strains of *Cryphonectria parasitca*
   B. Avirulent strains of *Cryphonectria parasitca*
   C. Double stranded RNA mycovirus
   D. All of the above.

8. The antibiotic phenzine-1-caboxylic acid (PCA) is responsible for suppressive soil against "Take all" disease decline of wheat
   A. *Pseudomonas fluorescens* B. *Bacillus subtilis*
   C. *Bacillus thureinginsis* D. *Rhizobium radiobacter*
9. Application of green manure is actually a method of biological control brought about by increase in population of saprobic organisms. The method is:
   A. Antibiosis B. Hyperparasitism
   C. Competition D. Hypovirulance
10. The root nematode is controlled by the predatory fungi
   A. Trichoderma virens B. Arthobotrys sp.
   C. Dactylella bembicoides D. All of the above
11. The method of biocontrol in which the bioagents are directly applied to the infection court, at high population level is
   A. Innundative application B. Augmentative application
   C. Occasional application D. None of the above
12. Mark out the right sentence from the following
   A. Monogenic resistance is durable, qualitative, and race specific
   B. Monogenic resistance is unstable, qualitative, and race specific
   C. Monogenic resistance is stable, qualitative, and single-gene governed
   D. Monogenic resistance is durable, quantitative, and race specific
13. The term Biological control was introduced by
   A. Sanford B. Von Tubeuf
   C. Garret D. Cook
14. Plant resistance formally got included in biological control in the definition given by
   A. Sanford B. Von Tubeuf
   C. Garret D. Cook
15. Biocontrol agents confers which type of resistance
   A. SAR B. ISR
   C. Cross protection D. All of the above
16. SAR is induced by
   A. Virulent pathogen B. Avirulent pathogen
   C. PGPR D. Any microbe
17. In presently grown resistant cultivars, resistance has been brought from germplasm of
   A. Hybrids B. Wild species
   C. Resistant varieties D. Cultivated varieties
18. The gene joined to 35S promoter of CaMV and incorporated in tobacco plants to develop resistance against bud worm and several other insect pests is
   A. CPTI B. CTTI
   C. CPPI D. CTPI

19. Two genes which have been incorporated in plants for fungal resistance are
A. Genes encoding for endochitinase
B. Genes encoding for β-endoglucanase
C. Both a and b D. None of the above

20. In agroinfection, *Ti* plasmid is made more effective by deleting genes encoding hormones
A. Auxin B. Cytokinin
C. Both a and b D. None of the above

21. To control Crown gall, recommended bio-control agent Agrobacterium radiobacter strain K-84 is under the trade name of 1
A. Blue circle B. Intercept
C. BINAB D. Norbac 84-C

22. Galltrol is
A. *Pseudomonas spp.* B. *Pythium oligandrum*
C. *Agrobacterium radiobacter K-84* D. None.

23. The major bio-agent of BINAB is2
A. *Trichoderma harzianum* B. *Trichoderma lignorum*
C. *Trichoderma harzianumpolysporum* D. None

24. Rhizoctonia spp. can be controlled by 3
A. Dagger G B. Trichodermin-3
C. Gilogard D. All of the Above

25. *Fusarium oxysporum* Schlechtendal (nonpathogenic strains)4
A. Biofox C B. Giligard
C. Mycostop D. F-Stop

26. Polygandron5
A. *Streptomyces griseovirides* B. *Gliocladium virens*
C. *Pythium oligandrum* D. *Fusarium oxysporum*

27. TY is 6
A. *Trichoderma harzianum* B. *Streptomyces griseovirides*
C. *Pseudomonas fluorescens* D. *Pseudomonas cepacian*

28. Pythium ultimumTrow in sugar beet can be controlled by using7
A. TY B. Polygandron
C. Mycostop D. F-stop

29. Source of Coniothrin8
A. *Coniothyriumminitans* B. *Gliocladium virens*
C. *Pythium oligandrum*
D. *Trichoderma harzianumpolysporum*

30. Pseudomonas fluorescens
A. Gilogard B. Blue Circle
C. Dagger G D. BINAB

31. Trident
A. *B. thuringiensis kurstaki*
B. *B. thuringiensis aizawai*
C. *B. thuringiensis israelensis*
D. *B. thuringiensis morrisoni*

32. Kodiak, is
A. *Bacillus subtilis* B. *B. velegensis*
C. *Trichoderma harzianum* D. None

33. Cladosan is used against
A. Fungus B. Bacteria
C. Nematodes D. None

34. Royal 300 is used control
A. *Meloidogyne spp.*
B. *Ditylenchus myceliophagus*
C. Both D. None

35. Clandosan which is used to control plant-parasitic nematodes is a _____ based bio control product
A. NPV B. fungal
C. bacterial D. Chitin

36. The adoption of any biological control agent in commercial agriculture is dependent on its _____ and its_____.
A. Potential market; Cost of development
B. Reliability; Availability
C. Applicability; potential market
D. None of the above

37. _____is a form of disease control that uses the natural defence responses of the plant, which may include the production of phytoalexins, additional lignification of cells, and other mechanisms
A. Induced resistance
B. Systemic Acquired Resistance
C. Cross-Protection D. None of the above

38. _____can reduce physiological vigor and reproductive capacity, can occur in small laboratory populations of biocontrol agents such as parasites and predators over time.
A. Heterosis B. Inbreeding depression
C. Cross-breeding D. None of the above

39. Mycostop is the trade name
A. *Trichoderma harzianum* B. *Trichoderma lignorum*
C. *Streptomyces griseovirides* D. None

40. Non-pathogenic isolates *Fusarium oxysporum* is marketed as a trading name of
A. Fusaclean B. Bio-fox C
C. Both D. None

41. The chestnut blight pathogen *Cryphonectria parasitica* is naturally controlled by hypovirulent strain of the fungus in-
A. Ireland B. Italy
C. France D. Canada

42. The chestnut blight pathogen *Cryphonectria parasitica* is controlled by hypovirulent strain of the fungus through artificial inoculation in-
A. Ireland B. Italy
C. France D. Canada

43. Hypovirulent strains of chestnut blight pathogen *Cryphonectria parasitica* carry-
A. Single stranded RNA virus (ssRNA)
B. Double stranded RNA virus (dsRNA)
C. Single stranded DNA virus (ssDNA)
D. Double stranded DNA virus (dsDNA)

44. Principal fungi used as biological control agents against soil borne diseases include-
A. *Gliocladium virens*
B. *Trichoderma harzianum*
C. *Trichoderma viride* D. All of the above

45. Preharvest and postharvest Botrytis rot of strawberries can be reduced by spraying this biocontrol agent on strawberry blossoms and young fruit-
A. *Cladosporium sp.* B. *Trichoderma sp.*
C. *Candida oleophila* D. All of the above

46. The yeast *Candida oleophila* was approved under the trade name Aspire for-
A. Post harvest decay of citrus and apple B. Leaf spot diseases
C. Powdery mildew diseases D. Rust and smut diseases

47. Control of crown gall disease based on production of a bacteriocin called agrocin 84 which is produced by-
A. *Agrobacterium radiobacter*
B. *Agrobacterium tumefaciens*
C. *Agrobacterium rhizogens*
D. None of the above

48. Bacterial biocontrol agent which can be used for seed treatment to control diseases-
A. *Bacillus subtilis* B. *Streptomyces sp.*
C. *Pseudomonas fluorescens* D. All of the above

49. The bacterial biocontrol agent that provides effective biocontrol of damping-off disease of legumes-
A. *Bacillus subtilis* B. *Bacillus cereus*
C. *Pseudomonas fluorescens* D. *Pantoea sp.*

50. Bacterial biocontrol agents that controls diseases of aerial plant parts-
A. *Erwinia herbicola*
B. *Pseudomonas fluorescens*
C. *Bacillus subtilis* D. All of the above

51. Which one of the following non-ice nucleation-active antagonistic bacteria applied to ice nucleation-active bacteria on the plant surfaces to protect frost-sensitive plants from injury at low temperatures?
A. *Erwinia herbicola*
B. *Pseudomonas fluorescens*
C. *Pseudomonas syringae*
D. All of the above

52. The fungus *Colletotrichum gloeosporioides*, sold as Collego is effective against-
A. *Aeschynomene virginica* B. *Morrenia adorata*
C. *Cassia obtusifolia* D. All of the above

53. The fungus which can be effectively used to control weeds-
A. *Colletotrichum gloeosporioides*
B. *Phytophthora palmivora*
C. *Alternaria cassiae* D. All of the above

54. The fungus which can be used as mycoherbicide for control of water hyacinth (*Eichhornia crassipes*)-
A. *Colletotrichum gloeosporioides* B. *Cercospora rodmanii*
C. *Phytophthora palmivora* D. *Alternaria cassiae*

55. The most used viral gene for making virus resistant transgenic plant is-
A. Coat protein B. Replicase
C. Movement protein D. All of the above

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CHAPTER 9
BIOLOGICAL CONTROL OF PLANT DISEASES

1. Ans: a. **Crimson sweet**. Book: G.N. Agrios, page no: 305
2. Ans: a. **Pasteurization of soil at 60! for 30 mins.** Book: G.N. Agrios, page no: 305
3. Ans: a. **Cruciferaceae**. Book: G.N. Agrios, page no: 305
4. Ans: a. **Crotocaria**. Book: G.N. Agrios, page no: 308
5. Ans: c. **Marigold and asparagus**. Book: G.N. Agrios, page no: 30
6. Ans: d. **Rhizobium radiobacter.** Book: Modern plant pathology H. C. Dube, page no: 257
7. Ans: b. **Avirulent strains *C. parasitica***. Book Modern plant pathology H. C. Dube, page no: 257
8. Ans: a. ***Pseudomonas fluorescens***. Book: Modern plant pathology H. C. Dube, page no: 258
9. Ans: c. **Competition**. Book: Modern plant pathology H. C. Dube, page no: 259
10. Ans: c. ***Dactylella bembicoides.*** Book: Modern plant pathology H. C. Dube, page no: 260
11. Ans: a. **Innundative application.** Book: Modern plant pathology H. C. Dube, page no: 261
12. Ans: b. **Monogenic resistance is unstable, qualitative, and race specific.** Book: Modern plant pathology H. C. Dube, page no: 261
13. Ans: b. **Von Tubeuf.** Book: Modern plant pathology H. C. Dube, page no: 13
14. Ans: d. **Cook**. Book: Modern plant pathology H. C. Dube, page no: 255
15. Ans: d. **All of the above** Book: Modern plant pathology H. C. Dube, page no: 256
16. Ans: b. **Avirulent pathogen** Book: Modern plant pathology H. C. Dube, page no: 257
17. Ans: b. **Wild species** Book: Modern plant pathology H. C. Dube, page no: 262
18. Ans: a. **CPTI** Book: Modern plant pathology H. C. Dube, page no: 264
19. Ans: c. **Both a and b.** Book: Modern plant pathology H. C. Dube, page no: 266
20. Ans: c. **Both a and b**. Book: Modern plant pathology H. C. Dube, page no: 263
21. Ans: d. **Norbac 84-C**. Source: Handbook of biological control, Ch: 32 page: 851
22. Ans: c. ***Agrobacterium radiobacter* K-84**. Source: Handbook of biological control, Ch: 32 page: 851

23. Ans: d. **None**. Source: Handbook of biological control, Ch: 32 page: 851
24. Ans: a. **Dagger G** Source: Handbook of biological control, Ch: 32 page: 851
25. Ans: c. **Mycostop**. Source: Handbook of biological control, Ch: 32 page: 851
26. Ans: b. ***Gliocladium virens*.** Source: Handbook of biological control, Ch: 32 page: 851
27. Ans: a. ***Trichoderma harzianum***. Source: Handbook of biological control, Ch: 32 page: 851
28. Ans: b. **Polygandron**. Source: Handbook of biological control, Ch: 32 page: 851
29. Ans: a. ***ConiothyriumminitAns:*** Source: Handbook of biological control, Ch: 32 page: 851
30. Ans: a. **Gilogard.** Source: Handbook of biological control, Ch: 32 page: 851
31. Ans: d. ***B. thuringiensis morrisoni.*** Source: Handbook of biological control, Ch: 32 page: 851
32. Ans: a. ***Bacillus subtilis***. Source: Handbook of biological control, Ch: 32 page: 851
33. Ans: c. **Nematodes**. Source: Handbook of biological control, Ch: 32 page: 851
34. Ans: b. *Ditylenchus myceliophagus.* Source: Handbook of biological control, Ch: 32 page: 851
35. Ans: d. **Chitin**. Source: Handbook of biological control, Ch: 32 page: 851
36. Ans: b. **Reliability; Availability**. Source: Handbook of biological control, Ch: 32 page: 851
37. Ans: a. **Induced resistance** Source: Handbook of biological control, Ch: 32 p Page: 851
38. Ans: b. **Inbreeding depression**. Source: Handbook of biological control, Ch: 32 page: 851
39. Ans: c. ***Streptomyces griseoviridis***. Source: Handbook of biological control, Ch: 32 page: 851
40. Ans: c. **Both**. Source: Handbook of biological control, Ch: 32 page: 851
41. Ans: b. **Italy.** Source-Plant Pathology by G. N. Agrios.Chapter-9-Control of Plant Diseases, page-325
42. Ans: c. **France.** Source-Plant Pathology by G. N. Agrios.Chapter-9-Control of Plant Diseases, page-325
43. Ans: b. **Double stranded RNA virus (dsRNA)**. Source-Plant Pathology by G. N. Agrios.Chapter-9-Control of Plant Diseases, page-325
44. Ans: d. **All of the above.** Source-Plant Pathology by G. N. Agrios.Chapter-9-Control of Plant Diseases, page-325
45. Ans: b. ***Trichoderma sp***. Source-Plant Pathology by G. N. Agrios.Chapter-9-Control of Plant Diseases, page-326]
46. Ans: a. **Post-harvest decay of citrus and apple.** Source-Plant Pathology by G. N. Agrios.Chapter-9-Control of Plant Diseases, page-326
47. Ans: a. ***Agrobacterium radiobacter***. Source-Plant Pathology by G. N. Agrios.Chapter-9-Control of Plant Diseases, page-326

48. Ans: d. **All of the above**. Source-Plant Pathology by G. N. Agrios.Chapter-9-Control of Plant Diseases, page-326
49. Ans: b. *Bacillus cereus*. Source-Plant Pathology by G. N. Agrios.Chapter-9-Control of Plant Diseases, page-327
50. Ans: d. **All of the above**. Source-Plant Pathology by G. N. Agrios.Chapter-9-Control of Plant Diseases, page-328
51. Ans: d. **All of the above**. Source-Plant Pathology by G. N. Agrios.Chapter-9-Control of Plant Diseases, page-328
52. Ans: d. **All of the above**. Source-Plant Pathology by G. N. Agrios.Chapter-9-Control of Plant Diseases, page-329
53. Ans: d. **All of the above**. Source-Plant Pathology by G. N. Agrios.Chapter-9-Control of Plant Diseases, page-329
54. Ans: b. ***Cercospora rodmanii***. Source-Plant Pathology by G. N. Agrios.Chapter-9-Control of Plant Diseases, page-329
55. Ans: a. **Coat protein**. Source-Plant Pathology by G. N. Agrios.Chapter-9-Control of Plant Diseases, page-321-322

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CHAPTER 10
PLANT DISEASE EPIDEMIOLOGY

1. When a pathogen spreads to and effects many individuals within a population over a relatively large area and within a relatively short time, the phenomenon is called as
   A. Sporadic B. Pandemic
   C. Epidemic D. None
2. The study of epidemics and the factors that influence them is called as
   A. Etiology B. Epidemiology
   C. Epiphytology D. Forecasting
3. The classical disease triangle includes which of the following?
   A. Virulent pathogen B. Susceptible host
   C. Favorable environment D. All of the above
4. The plant disease epidemics which caused tremendous losses in the history are which of the following?
   A. Irish famine B. Bengal famine
   C. Coffee rust D. All of the above.
5. Irish famine was caused by the pathogen?
   A. *Phytopthora infestans* *B.* *Alternaria solani*
   C. Potato virus X *D.* *Helminthosporium oryzae*
6. The fourth component of disease tetrahedron is
   A. Pathogen B. Host
   C. Environment D. Time
7. **Statement 1:** No epidemic occurs in plants carrying race-specific (vertical) resistance
   Statement 2: Plants carrying vertical resistance do not allow a pathogen to become established.
   A. Statement 1 is correct and statement 2 is incorrect
   B. Statement 2 is correct and statement 1 is incorrect
   C. Both statement 1 and 2 are correct
   D. Both statement 1 and 2 are incorrect
8. Host factors that affect the development of epidemics are which of the following
   A. Levels of genetic resistance or susceptibility of the host
   B. Degree of genetic uniformity of host plants

C. Type of crop
D. Age of host plants
E. All of the above

9. Pathogen factors that affect the development of epidemics are
A. Levels of virulence
B. Quantity of inoculum near hosts
C. Types of reproduction of the pathogen
D. Ecology of the pathogen
E. Mode of spread of the pathogen
F. All of the above

10. The chances of higher to low rates of epidemics generally occur in which of the following order
A. Self-pollinated>cross pollinated>vegetatively propagated plants
B. Cross-pollinated>self-pollinated>vegetatively propagated plants
C. Vegetatively propagated plants>Self-pollinated>cross pollinated
D. Vegetatively propagated plants>Cross-pollinated>self-pollinated

11. **Statement 1:** In diseases of annual crops such as corn, vegetables, rice and cotton epidemics develop much more rapidly
Statement 2: Epidemics of fruits and forest does not take years to develop.
A. Statement 1 is correct and statement 2 is incorrect
B. Statement 2 is correct and statement 1 is incorrect
C. Both statement 1 and 2 are correct
D. Both statement 1 and 2 are incorrect

12. The change of resistance with age is known as
A. Syncogenic resistance
B. Polygenic resistance
C. Oligogenic resistance
D. Ontogenic resistance

13. **Statement 1:** Level of virulence determine the amount of production of inoculum in the host
Statement 2: Virulent pathogens capable of infecting the host rapidly ensure a faster production of larger amount of inoculum, and, thereby, disease, than pathogens of lesser virulence
A. Statement 1 is correct and statement 2 is incorrect
B. Statement 2 is correct and statement 1 is incorrect
C. Both statement 1 and 2 are correct
D. Both statement 1 and 2 are incorrect

14. Pathogens that can produce many generations in a single growing season are known as
A. Monocyclic pathogen
B. Polycyclic pathogen
C. Polyetic pathogen
D. None

15. Most of the viruses are transmitted by which of the following
    A. Beetles B. Aphids and whiteflies
    C. Leafhoppers D. Psyllids
16. The most important environmental factors that affect the development of plant disease epidemics are
    A. Moisture and temperature B. Rain
    C. Sunlight D. Wind
17. **Statement 1:** Low temperature reduces the amount of inoculum of oomycetes fungi, bacteria, and nematodes that survives cold weather.
Statement 2: High temperature reduces the inoculum of viruses and mollicutes that survives hot summer temperatures
    A. Statement 1 is correct and statement 2 is incorrect
    B. Statement 2 is correct and statement 1 is incorrect
    C. Both statement 1 and 2 are correct
    D. Both statement 1 and 2 are incorrect
18. Which of the following increases the possibility and severity of epidemics?
    A. Continuous monoculture
    B. Large acreages planted to the same variety of crop
    C. High levels of nitrogen fertilization and dense planting
    D. All of the above
19. Which of the following comes under the category of introduction of new pathogens into areas where the host have not had a chance to evolve resistance to these pathogens?
    A. Chestnut blight B. Dutch elm disease
    C. Citrus canker D. All of the above
20. Which one of the following is one of the relatively quick and easy parameters used in epidemiological studies?
    A. Measuring of pathogen inoculum
    B. Measuring of host range
    C. Measuring of disease incidence
    D. All of the above
21. AUDPC stands for
    A. Area under development progression curve
    B. All useful disease progress curve
    C. Area under disease progress curve
    D. None
22. First computer simulation program written in 1969 was
    A. EPICORN B. EPIVEN
    C. CERCOS D. EPIDEM

23. Match the following

A.	EPIDEM	a.	Cercospora
B.	CERCOS	b.	Mycosphaerella
C.	MYCOS	c.	Helminthosporium
D.	EPICORN	d.	Venturia
E.	EPIVEN	e.	Alternaria

A. A-e, B-a,C-b,D-c, E-d B. A-c, B-b, C-d, D-a, E-e
C. A-a, B-b, C-c, D-d, E-e D. A-e, B-d, C-c, D-b, E-a

24. Which of the following are new tools used in epidemiological studies

A. Molecular tools B. GIS and GPS
C. Geostatistics
D. Remote sensing and Image analysis
E. All of the above

25. Match the following

A.	BLITECAST	a.	wheat
B.	TOM	b.	grapes
C.	GrapES	c.	peach and nectarine
D.	CONSELLOR	d.	apple
E.	CALEX	e.	wheat
F.	POMME	f.	tomato
G.	MoreCrop	g.	potato

A. A-e, B-c, C-b, D-d, E-a, F-g, G-f
B. A-g, B-f, C-b, D-e, E-c, F-d, G-a
C. A-a, B-f, C-b, D-e, E-c, F-d, G-g
D. A-b, B-f, C-g, D-e, E-a, F-d, G-c

26. *Puccinia recondita* and *Puccinia graminis* spores are resistant to ……. due to presence of melanin in the uredinospore walls

A. High temperature B. Relative humidity
C. Systemic fungicides D. UV light

27. At which water potential of soil all the soil borne pathogens are active and cause d isease in the field

A. < 15 bar B. > 15 bar
C. 10-15 bar D. 0-10 bar

28. Minimum wind speed required for *Puccinia graminis* spores release ……. And Spore liberation increases linearly when the wind speed reaches maximum…….

A. 7mph and 18 mph B. 12 mph and 50 mph
C. 3mph and 16 mph D. 20mph and 80 mph

29. Best method to calculate the viable spores present in per unit volume of air

A. Hirst spore trap B. Rotorod sampler
C. Soil screw trap D. Jet spore trap

30. When inoculum density is plotted against disease incidence, a sigmoid curve is obtained. In which synergism occurs the curve will be,

A. Flatten B. Steepen
C. Wavy D. Bell shaped

31. Which of the following are direct disease assessment methods

i) Disease loss assessment ii) Critical point model
iii) Standard area diagram iv) Multiple point model
v) Descriptive keys

A. i , v B. iii, v
C. ii, iv D. i, ii, iv

32. A straight forward sigmoid curve is converted into straight line by log-log transformation. Who justified the use of transformation on ecological studies

A. Garret 1956 B. Vander Plank 1963
C. Baker 1978 D. H.H. Flor 1918

33. Disease severity of purple blotch of onion caused by *Alternaria porri* calculated by

A. CODEX B. EPIDEM
C. AUDPC D. EPIDEMIC

34. The yield loss assessment for rice blast equation is Y=0.57x where, x denotes

A. Night temperature 10ºC for 15 days
B. Relative humidity >90% for 15 days
C. No.of pyriform conidia present in the air
D. Blasted nodes 30 days after heading

35. Critical point models probably applicable, when

i) The disease is late epidemic
ii) Infection rate 'r' is fairly stable
iii) Accumulation of dry matter covers only a short period
iv) High variability in the infection rate 'r'
v) The area is largely covered by single crop

A. ii , iii, iv B. i , ii, iii C. i, ii, v D. All of the above

36. Multiple point models are applicable only when

i) The disease is late epidemic
ii) High variability in the infection rate 'r'
iii) Epidemic develop over a long time relative to crop life
iv) Dry matter accumulation is a prolonged process
v) Dry matter accumulation is a short period

A. i , iii, v B. . ii, iii, v
C. i, ii, iv D. ii , iii, iv

37. Who gave the equation Y (% loss) = f(X1, X2) which is different from multiple point model for yield loss assessment of Wheat stem rust
A. Burleigh *et al*. 1972 B. James *et al*. 1972
C. Calpouzos *et al*. 1976 D. Schneider *et al*. 1976

38. Select the correct match
A. Descriptive model – Based on theory
B. Predictive model – Based on regression equation
C. Conceptual model – Based on meteorological factors
D. Area under the curve model – Based on correlation

39. EPIMAY – a forecasting model for southern corn blight developed by which model
A. Descriptive model B. Predictive model
C. AUDPC model D. Conceptual model

40. The process of movement of individual pathogen in and out of th host population or population area is given by a curve called as……
A. Rate curve B. Disease gradient curve
C. Saturation curve D. Bimodel curve

41. An example disease showing symmetrical (bell shaped) rate curves…….
A. Apple scab B. Downey mildew
C. Powdery mildew D. Late blight of potato

42. Epidemic rate for cucumber mosaic virus …..
A. 0.3-0.5 units/day B. 0.3-0.6 units/day
C. 0.15 units / day D. 0.02 units / day

43. Which of the following is the decision support system
A. PAWS B. TOM
C. CALEX D. POMME

44. First expert system in plant pathology developed in 1983 to diagnose
A. Rice diseases B. Wheat diseases
C. Potato diseases D. Soybean diseases

45. A curve indicates a characteristics of monocyclic diseases
A. Bimodel curve B. Sigmoid curve
C. Saturation curve D. Flattened curve

46. The first models of the temporal development of epidemics were developed by
A. Madden B. Vander Planck
C. Jones D. Campbell

47. EPIDEM was the forecasting model to study the epidemics of
A. *Mycospherella musicola* B. *Helminthosporium maydis*
C. *Venturia inequalis* D. *Alternaria solani*

48. EPIVEN was the forecasting model to study the epidemics of
A. *Mycospherella musicola* B. *Helminthosporium maydis*
C. *Venturia inequalis* D. *Alternaria solani*

49. MYCOS was the forecasting model to study the epidemics of
A. *Mycospherella musicola* B. *Helminthosporium maydis*
C. *Venturia inequalis* D. *Alternaria solani*

50. CERCOS was the forecasting model to study the epidemics of
A. *Mycospherella musicola* B. *Helminthosporium maydis*
C. *Venturia inequalis* D. Cercospora Blight

51. Who gave the concept of Durable resistance?
A. Johnson and law B. Watson and Singh
C. Campbell and Maden D. None of the above

52. Plants show adult resistance when they are infected with
A. Rust B. Smut
C. Downy mildew D. All of the above

53. Dutch rules was proposed by
A. Vander planck B. Jones
C. Van Everdingen D. Beaumont

54. AUDPC curve used for the first time to measure which disease?
A. Apple scab B. Stem rust of wheat
C. Brown spot of rice D. Bacterial Blight of rice

55. AUDPC curve was used for the first time by?
A. Vander Planck B. Jones
C. Campbell D. Madden

56. CONSELLER expert system was developed for which crop?
A. Wheat B. Rice
C. Maize D. Sugarcane

57. WISDOM decision support system was developed for which crop?
A. Tomato B. Brinjal
C. Potato D. Cassava

58. CALEX expert system was developed for which crop?
A. Wheat B. APPLE
C. PEACH D. Peach and nectarine

59. RADAR decision support system was developed for which crop?
A. Wheat B. APPLE
C. PEACH D. Peach and nectarine

60. Who developed the first computer simulation Program?
A. Marshal and Kulka B. Waggoner and Horsfall
C. Campbell and Maden D. Schledin and Schwann

61. Who developed the first visual scale for estimating the disease.?
A. Jones B. Horsfall
C. Cobb D. None of the above

62. Protein for protein theory was given by?

A. Jones B. Horsfall

C. Vanderplanck D. None of the above

63. Who gave the term clean and dirty crop approach?

A. Jones B. Marshall

C. Cobb D. None of the above

64. Who gave the concept of gene pyrammiding?

A. Johnson and law B. Watson and Singh

C. Campbell and Maden D. None of the above

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CHAPTER 10
PLANT DISEASE EPIDEMIOLOGY

1. (Ans: C, Source: G.N Agrios pg.no 266)
2. (Ans: B, Source: G.N Agrios pg.no 266)
3. (Ans: D, Source: G.N Agrios pg.no 266)
4. (Ans: D, Source: G.N Agrios pg.no 266)
5. (Ans: A, Source: G.N Agrios pg.no 266)
6. (Ans: D, Source: G.N Agrios pg.no 267)
7. (Ans: D, Source: G.N Agrios pg.no 267)
8. (Ans: E, Source: G.N Agrios pg.no 268)
9. (Ans: F, Source: G.N Agrios pg.no 269,270)
10. (Ans: C, Source: G.N Agrios pg.no 268)
11. (Ans: A, Source: G.N Agrios pg.no 268)
12. (Ans: D, Source: G.N Agrios pg.no 268)
13. (Ans: C, Source: G.N Agrios pg.no 269)
14. (Ans: B, Source: G.N Agrios pg.no 270)
15. (Ans: B, Source: G.N Agrios pg.no 271)
16. (Ans: A, Source: G.N Agrios pg.no 271)
17. (Ans: C, Source: G.N Agrios pg.no 272)
18. (Ans: D, Source: G.N Agrios pg.no 272)
19. (Ans: D, Source: G.N Agrios pg.no 273)
20. (Ans: C, Source: G.N Agrios pg.no 273)
21. (Ans: C, Source: G.N Agrios pg.no 273)
22. (Ans: D, Source: G.N Agrios pg.no 280)
23. (Ans: A, Source: G.N Agrios pg.no 280)
24. (Ans: E, Source: G.N Agrios pg.no 283,284)
25. (Ans: B, Source: G.N Agrios pg.no 288,289)
26. (Ans: D, Source: Fundamentals of plant pathology, Pathak, Khatri and Pathak, Page No. 119)
27. (Ans: A, Source: Fundamentals of plant pathology, Pathak, Khatri and Pathak, Page No. 119)
28. (Ans: C, Source: Fundamentals of plant pathology, Pathak, Khatri and Pathak, Page No. 119)
29. (Ans: D, Source: Fundamentals of plant pathology, Pathak, Khatri and Pathak, Page No. 121)

30. (Ans: B, Source: Fundamentals of plant pathology, Pathak, Khatri and Pathak, Page No. 122)
31. (Ans: B, Source: Fundamentals of plant pathology, Pathak, Khatri and Pathak, Page No. 123)
32. (Ans: C, Source; Fundamentals of plant pathology, Pathak, Khatri and Pathak, Page No. 122)
33. (Ans: A, Source: Fundamentals of plant pathology, Pathak, Khatri and Pathak, Page No. 126)
34. (Ans: D, Source: Fundamentals of plant pathology, Pathak, Khatri and Pathak, Page No. 127)
35. (Ans: B, Source: Fundamentals of plant pathology, Pathak, Khatri and Pathak, Page No. 128)
36. (Ans: D, Source; Fundamentals of plant pathology, Pathak, Khatri and Pathak, Page No. 128)
37. (Ans: C, Source: Fundamentals of plant pathology, Pathak, Khatri and Pathak, Page No. 129)
38. (Ans: B, Source: Fundamentals of plant pathology, Pathak, Khatri and Pathak, Page No. 130)
39. (Ans: D, Source: Fundamentals of plant pathology, Pathak, Khatri and Pathak, Page No. 133)
40. (Ans: B, Source: Plant Pathology, Agrios Page No. 274)
41. (Ans: D, Source: Plant Pathology, Agrios Page No. 276)
42. (Ans: C, Source: Plant Pathology, Agrios Page No. 277)
43. (Ans: A, Source: Plant Pathology, Agrios Page No. 289)
44. (Ans: D, Source: Plant Pathology, Agrios Page No. 289)
45. (Ans: C, Source: Plant Pathology, Agrios Page No. 276)
46. (Ans: B, Source: Modelling plant disease epidemics A. van Maanen1 and X.-M. Xu, European Journal of Plant Pathology 109: 669–682, 2003)
47. (Ans: D, Source: G.N Agrios, pg.no- 280)
48. (Ans: C, Source: G.N Agrios, pg.no- 280)
49. (Ans: A, Source: G.N Agrios, pg.no- 280)
50. (Ans: D, Source: G.N Agrios, pg.no- 280)
51. (Ans: A, Source: Durable resistance: A key to sustainable management of pathogens and pests)
52. (Ans: D, Source: G.N Agrios, pg.no- 268)
53. (Ans: C, Source: THE EPIDEMIOLOGY OF PLANT DISEASES, D. GARETH JONES Page No; 212)
54. (Ans: B, Source: G.N Agrios, pg.no- 269)
55. (Ans: A, Source: G.N Agrios, pg.no- 269)
56. (Ans: A; Source: International Journal of Science Technology & Engineering| Vol. 1, Issue 5, November 2014)

57. (Ans: C, Source: In book: Advanced Informatics for Computing Research page 69)
58. (Ans: D, Source: International Journal of Science Technology & Engineering, Vol. 1, Issue 5, November 2014)
59. (Ans: B, Source: In book: Advanced Informatics for Computing Research page 69)
60. (Ans: B, Source: Plant Disease: An Advanced Treatise: How Disease Develops in Populations page 203)
61. (Ans: C, Source: Plant disease severity estimated visually: a century of research, best practices, and opportunities for improving methods and practices to maximize accuracy)
62. (Ans: C, Source: Disease resistance in plants Page 22)
63. (Ans: B, Source: Multiline varieties and disease control : I. The "dirty crop" approach with each component carrying a unique single resistance gene)
64. (Ans: B, Source: Gene pyramiding an overview)

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CHAPTER 11

PLANT DISEASE CONTROL AND MANAGEMENT

1. Potato seed tubers can be made free of viruses by growing in
   A. Northeastern regions B. Western regions
   C. Southeastern regions D. Northern regions
2. Spacing plants properly in the field inhibits infection by certain pathogens like
   A. Pythium *B. Botrytis and Peronospora tabacina*
   C. Fusarium *D. Sclerotinia sclerotiorum*
3. *T. harzianum* fungus has been shown to parasitize mycelia of
   A. Rhizoctonia and *Sclerotium* *B. Pythium* and *Phytophthora*
   C. Fusarium and *Heterobasidion* D. All of the above
4. *Meloidogyne javanica* and *Pratylenchus sp.* nematodes are parasitized by
   A) Pasteuria (Bacillus) penetrans B) Psedumonas fluorescence
   C) Trichoderma viride D) Trichoderma harzianum
5. *Crotalaria* plants trap the juveniles of which of the following nematode?
   A) Pratylenchus sp. *B) Trichuris trichiura*
   C) Meloidogyne sp. *D) Globodera sp.*
6. The protection provided to a plant by infection with a mild strain of a virus from subsequent infection by a more severe strain of the same virus that normally causes more severe symptoms
   A) Cross-resistance B) Cross protection
   C) Both D) None of the above
7. Actigard is an example of
   A) Plant hormone B) Plant activators
   C) Anti-transpirant D) None
8. Source of Aspire is
   A) *Candida oleophilaI*-182 B) *Streptomyces lydicus*
   C) *B. pumilus* GB34 D) *Erwinia amylovora*
9. Source of Messenger is
   A) B. pumilus GB34 *B) Ampelomyces Quisqualis*
   C) Erwinia amylovora *D) Streptomyces lydicus*
10. Benzodiathiazole derivative is the source of
   A) Actinovate B) Bioguard
   C) YieldShield D) Bion WG50

11) The source of AQ10 Biofungicide is1

A) *Ampelomyces quisqualis*M-10 B) P. fluorescens
C) P. syringae D) All of the above

12) *Cercospora rodmanii* is used to control

A) *Mikania micrantha* B) *Eichhornia crassipes*
C) *Lantana camara* D) None

13) Root Shield is used to control

A) *Pythium spp.* B) *Rhizoctonia spp.*
C) *Fusarium spp.* D) All of the above

14) ----_____ is a synthetic salicyclic acid plus oxygen generator.

A) Oxycom B) Serenade
C) Aspire D) Actinovate

15) In The Bordeaux Mixture What Acts As A 'Safener'?

A) Lime B) Copper
C) Both Copper and Lime D) None of The Above

16) Chemical compounds that act as plant defense activators2

A) SalicyclicAcid (SA) B) IsonicotinicAcid (INA)
C) Phenolic Acids D) All of The Above

17) Which is the oldest known fungicide element? 3

A) Carbon B) Nitrogen
C) Sulphur D) Phosphate

18) Chloranil and Dichlone are

A) Phenolic Compunds B) Quinones
C) Aromatic Compunds D) Film-Forming Compounds

19) Pentachloro nitrobenzene is a long-lasting fungicide used against4 – pg no : 340

A) Soil-borne pathogens B) Seed-borne pathogens
C) Wind-borne pathogens D) All of the above

20) _____ also marketed as "Cedomon" used to controlBarley, oat leaf spots, *Fusarium* on grain cereals5

A) *Pseudomonas aureofaciens* B) *P. fluorescence*
C) *P. syringae* D) *P. chlororaphis*

21. The fungicide_____ had shown its supremacy over all the other test fungicides, both in transplanted and upland conditions in checking the blast infection and improving the grain yield

A. Hinosan B. Fongorene
C. Tricyclazole D. Propiconazole

22. Udbatta disease of rice can be effectively controlled by treating seeds in hot water at

A. 40-44ºC for 10 mins B. 50-54ºC for 10 mins
C. 40-44ºC for 15 mins D. 50-54ºC for 15 mins

23. Which of the following is a *Fusarium* wilt resistant muskmelon rootstock
A. Kurodane B. LS89
C. Shiko No1 D. Shirokikuza

24. *Dactylella bembicoides* is a predatory fungus used to control
A. Cyst nematode of soyabean B. RKN of pineapple
C. Golden nematode of potato D. None

25. Pink disease of citrus caused by *Botryobasidium salmonicolor* is endemic in
A. Arunachal Pradesh B. Mizoram
C. Meghalaya D. Assam

26. The potato scab pathogen is highly suscepticle to the antagonistic effect of
A. Bacillus coagulans *B. Bacillus subtilis*
C. Pseudomonas azotoformans *D. Bacillus thuringiensis*

27. The antibiotic Kasugamycin was developed from
A. Streptomyces griseus *B. Streptomyces kayugaensis*
C. Streptomyces griseofulvin *D. Streptomyces scabies*

28. The antibiotic Kasugamycin is effective against
A. Fungus B. Bacteria
C. Mollicutes D. All of the above

29. For late blight of potato, plants are more susceptible at
A. Very young stage B. Vegetative stage
C. Mature stage D. Both very young and matured stage

30. The computer simulation model for forecasting apple scab
A. EPIDEM B. EPIVET
C. EPIVEN D. EPIPIRE

31. In India, damage to rice crop due to blast disease is estimated as high as
A. 65% B. 75%
C. 85% D. 95%

32. Injection with 2% Carbendazim plus 0.1% Agallol is followed to control
A. Fusarium wilt of banana B. Moko wilt of banana
C. Verticillium wilt of cotton D. Bacterial wilt of brinjal

33. The computer simulation model for forecasting late blight of potato
A. TOM-CAST B. BLIGHT CAST
C. SIMCAST D. Both b and c

34. _____proposed a theoretical explanation for the dynamic phenomenon of soil fungistasis, that there are three stages *viz* induction, maintenance and release of fungistasis
A. Dobbs and Hinson (1953) B. Watson and Ford (1972)
C. Brown (1987) D. Vanderplank (1967)

35. *Gliocladium roseum* is highly antagonistic to
A. Meloidogyne incognita *B. Rhizoctonia solani*
C. Alternaria alternate *D. Sclerotinia sclerotiorum*

36. Parasitism of pathogenic fungi by other fungi is generally termed as
A. Hyperparasitism B. Parasitism
C. Mycoparasitism D. Multiparasitism

37. The best method to improve the efficacy of biocontrol agents in disease management
A. Mutation B. Protoplast fusion
C. Genetic engineering D. All of the above

38. The biocontrol agent *Agrobacterium radiobacter* strain K84 is available as
A. Nogall B. Nogall diegall
C. Norbac 84C D. NOGALL 84

39. The biocontrol agent *Agrobacterium radiobacter* strain 84 is available as
A. Nogall B. Nogall diegall
C. Norbac 84C D. Galltrol-A

40. Samoucha and Gisi (1987) advocated the use of three way mixtures (oxadixyl/ mancozeb/cymoxanil) to control phenylamide sensitive and resistant strains of_____ on tomato and potato
A. Alternaria alternata *B. Phytophthora infestans*
C. Plasmopara viticola *D. Alternaria solani*

41. The *Xa21* resistance gene that provides resistance against all the races of *Xoo* is found in-
A. *Oryza glaberrima* B. *Oryza sativa*
C. *Oryza longistaminata* D. *Oryza officinalis*

42. Arize-Dhani, world's first hybrid variety resistant to *Xoo* pathovars was released by-
A. Bayer Crop Science B. Syngenta
C. DuPont D. Monsanto

43. 'Take All' disease of wheat caused by *Gaeumannomyces graminis* f.sp. *tritici* can be successfully controlled by rotating wheat with-
A. Rye B. Sorghum
C. Oats D. Rice

44. Disease free seeds can be used to control diseases caused by-
A. *Colletotrichum lindemuthianum* B. *Xanthomonas phaseoli*
C. *Pseudomonas phaseolicola* D. All of the above

45. Kaolin-based films have proven effective in protecting apple shoots from becoming infected with-
A. *Erwinia amylovora* B. *Podosphaera leucotricha*
C. Both a) and b) D. None of the above

46. Flooding of banana fields is done to control-
A. Sigatoka disease B. Bunchy top disease
C. Anthracnose D. Fusarium wilt

47. 'Ridging' is a cultural practice used to reduce infection in-
A. Onion B. Potato
C. Tomato D. Colocasia

48. For management of bacterial blight of cotton caused by *Xanthomonas campestris* pv. *malvacvearum* hot water treatment of delinted seeds are done at-
A. 56ºC for 10 min B. 54ºC for 10 min
C. 56ºC for 15 min D. 56ºC for 15 min

49. Choose the correct statement-
A. Qualitative resistance develops suddenly against fungicides that have a single-site of action.
B. Qualitative resistance is also called discrete resistance.
C. Qualitative resistance is seen with the use of benzimidazoles and QoI fungicides.
D. All of the above.

50. When a fungus develops resistance against one member of a fungicide group, it automatically becomes resistance to rest of the fungicide of that group, then it is called-
A. Qualitative resistance B. Multiple resistance
C. Cross resistance D. Quantitative resistance

51. Application of cross protection in controlling virus diseases has met with some success in case of-
A. Tomatoes with mild strains of *tobacco mosaic virus*
B. Citrus with mild strains of *citrus tristeza virus*
C. Papaya with mild strains of *papaya ring spot virus.*
D. All of the above

52. Successful transformation of plants for resistance to virus diseases has been obtained through the use of viral replicase genes, as in the cases of-
A. *Tomato yellow leaf curl virus* and *cucumber mosaic virus* in tomato
B. *Potato leaf roll virus* and *potato virus Y* in potato
C. Both a) and b) D. None of the above

53. Tobacco Mosaic Virus (TMV) is killed at a temperature of-
A. 50ºC B. 60-72 ºC
C. 80-90 ºC D. 95-100 ºC

54. When the resistance gene DRR206 from pea was transferred into canola, the transgenic canola plants exhibited resistance to-
A. *Leptosphaeria maculans* B. *Rhizoctonia solani*
C. *Sclerotinia sclerotiorum* D. All of the above

55. Which of the following is not true about Strobilurins?
A. First isolated from *Strobilurus tenacellus*
B. It interfers with ATP production

C. Strobilurin show translaminar movement
D. Strobilurin induce plant defense

56. Dimethyl sulphate, Nitrous acid, Hydroxylamine, Nitrogen mustard gas, Adenosine aminohydrolase for plant viruses are examples of
A. Dehydrating agents B. Mutagenic agents
C. Alkylating agents D. Dealkalating agents

57. Which of the following insecticide can be used for the control of plant virus vectors viz., whitefly, aphid, hoppers, thrips
A. Thiamethoxam 25 WG @ 0.2-00.25 ml / L
B. Acetamiprid 20 SP @ 0.2g / L
C. Dimethoate 30 EC @ 1.25-1.5 ml / L
D. Malathion 50 EC @ 1 – 1.5 ml / L
E. All of the above

58. a) TVMV b) TuMV
c) PVX d) PVY
e) TMV

Match the resistance gene with the pathogen
1) Rx, Nx, Nb 2) Py
3) Tm1, Tm2,N 4) TuRB01
5) Va
A. 1-a,2-d,3-e,4-b,5-c B. 1-c,2-a,3-e,4-b,5-d
C. 1-c,2-b,3-e,4-d,5-a D. 1-c,2-d,3-e,4-b,5-a

59. Spraying or dipping the plants with/in milk is a control measure that can be used for
A. CMV B. TMV
C. CaMV D. PVX

60. Repeated spraying of an oil emulsion @ 1-2% interval of 3-7 days in nursery of chilliand at 2.5% in the field at weekly intervals can be used for the control of
A. Cucumber mosaic virus B. Potato virus Y
C. Cauliflower mosaic virus D. Both A and B

61. In India, 2 % groundnut oil is found to be effective for the control of
A. Cucumber mosaic virus B. Papaya mosaic virus
C. Cowpea mosaic virus D. Both B and C

62. A) PLRV & PYV B) CLCuV
C) ICMV D) RTV

Match the following
1) Kufrichandramukhi 2) LR5166
3) Vikramarya 4) SreeVishakam
A. 1-A,2-C,3-D,4-B B. 1-A,2-B,3-D,4-C
C. 1-A,2-C,3-B,4-D D. 1-A,2-D,3-C,4-B

63. Lutrasil LS 10 gives 100% protection against transmission by

A. Potato virus X B. Potato virus Y

C. Potato leaf roll virus D. Both A and C

64. "Wise production practices" is referred to for

A. Chemical control B. Legislative control

C. Cultural control D. Host plant resistance

(Footnotes)

CHAPTER 11
PLANT DISEASE CONTROL AND MANAGEMENT

1. Ans: A, NorthEastern Region Source: GN Agrios, Plant Pathology, page: 296
2. Ans: B, Botrytis and Pernospora tabacina Source: GN Agrios, Plant Pathology, page: 302
3. Ans: D, All the above Source: GN Agrios, Plant Pathology, page: 305
4. Ans: A, Pasteuria penetrans Source: GN Agrios, Plant Pathology, page: 306
5. Ans: C, Meloidogyne spp. Source: GN Agrios, Plant Pathology, page: 308
6. Ans: B, Cross Protection Source: GN Agrios, Plant Pathology, page: 314
7. Ans: B, Plant Activators Source: GN Agrios, Plant Pathology, page: 316
8. Ans: A, Candida Oleophila I-82, Source: GN Agrios, Plant Pathology, page: 338
9. Ans: C, Erwinia amylovora Source: GN Agrios, Plant Pathology, page: 339
10. Ans: D, Bion WG 50 Source: GN Agrios, Plant Pathology, page: 316
11. Ans: A, Amplomyces quisqualis – 50 Source: GN Agrios, Plant Pathology, page: 316
12. Ans: B, Eicchornia crassipes Source: GN Agrios, Plant Pathology, page: 331
13. Ans: D, All of the above Source: GN Agrios, Plant Pathology, page: 324
14. Ans: A, Oxycom Source: GN Agrios, Plant Pathology, page: 316
15. Ans: A, Lime Source: GN Agrios, Plant Pathology, page: 338
16. Ans: D, All of the above Source: GN Agrios, Plant Pathology, page: 338
17. Ans: C, Sulphur Source: GN Agrios, Plant Pathology, page: 339
18. Ans: B, Quinones Source: GN Agrios, Plant Pathology, page: 339
19. Ans: A, Soil Borne Pathogens Source: GN Agrios, Plant Pathology, page: 340
20. Ans: D, P. chlororaphils Source: GN Agrios, Plant Pathology, page: 324
21. [Ans: C, Tricyclazole Source: Crop Protection, Management Strategies; Author: D. Prasad; Page No: 271]
22. [Ans: B, 50-54 C for 10 mins Source: Crop Protection, Management Strategies; Author: D. Prasad; Page No: 185]
23. [Ans: B, LS89 Source: Crop Diseases and Their Management; Author: Chaube & Pundhir; Page No: 466]
24. [Ans: B, RKN of Pineapple Source: Modern Plant Pathology; Author: H C Dube; Page No: 260]
25. [Ans: C, Meghalaya Source: Crop Protection, Management Strategies; Author: D. Prasad; Page No: 198]

26. [Ans: B, Bacillus subtilis Source: Plant Diseases; Author: R.S. Singh; Page No: 93]
27. [Ans: B, Streptomyces kayugaensis Source: Crop Protection, Management Strategies; Author: D. Prasad; Page No: 268]
28. [Ans: A, Fungus Source: Crop Protection, Management Strategies; Author: D. Prasad; Page No: 268]
29. [Ans: D, Both very young and matured stage Source: Plant Diseases; Author: R.S. Singh; Page No: 148]
30. [Ans: C, Epiven Source: Crop Diseases and Their Management; Author: Chaube & Pundhir; Page No: 183]
31. [Ans: B, 75% Source: Plant Diseases; Author: R.S. Singh; Page No: 414]
32. [Ans: A, Fusarium wilt of banana, Source: Plant Diseases; Author: R.S. Singh; Page No: 468]
33. [Ans: D, Both b and C Source: Crop Diseases and Their Management; Author: Chaube & Pundhir; Page No: 185]
34. [Ans: B, Watson and Ford Source: Crop Diseases and Their Management; Author: Chaube & Pundhir; Page No: 239]
35. [Ans: D, Sclerotinia sclerotiorum Source: Crop Diseases and Their Management; Author: Chaube & Pundhir; Page No: 242]
36. [Ans: C, Mycoparasitism Source: Crop Diseases and Their Management; Author: Chaube & Pundhir; Page No: 243]
37. [Ans: D, All of the above Source: Crop Diseases and Their Management; Author: Chaube & Pundhir; Page No: 250]
38. [Ans: C, Norbac 84C Source: Crop Diseases and Their Management; Author: Chaube & Pundhir; Page No: 255]
39. [Ans: D, Galltrol-A Source: Crop Diseases and Their Management; Author: Chaube & Pundhir; Page No: 255]
40. [Ans: B, Phytopthora infestans Source: Crop Diseases and Their Management; Author: Chaube & Pundhir; Page No: 310]
41. [Ans.(c). Oryza longistaminata Source-Modern Plant Pathology by H.C. Dube.Chapter-21-Leaf Spots and Blights. Disease Resistance II: Defense, page-305]
42. [Ans.(a). Bayer Crop Science Source-Modern Plant Pathology by H.C. Dube.Chapter-21-Leaf Spots and Blights, page-306]
43. [Ans.(c). Oats Source-Modern Plant Pathology by H.C. Dube.Chapter-18-Plant Disease Management (Plant Disease Control) I: Prevention, page-252]
44. [Ans.(d). All the above Source-Plant Pathology by G. N. Agrios.Chapter-9-Control of Plant Diseases, page-296]
45. [Ans.(c). Both A and B Source-Plant Pathology by G. N. Agrios.Chapter-9-Control of Plant Diseases, page-299]

46. [Ans.(d). Fusarium wilt Source-Modern Plant Pathology by H.C. Dube.Chapter-18-Plant Disease Management (Plant Disease Control) I: Prevention, page-253]
47. [Ans.(b). Potato Source-Modern Plant Pathology by H.C. Dube.Chapter-21-Leaf Spots and Blights, page-319]
48. [Ans.(a). 56C for 10 mins Source-Modern Plant Pathology by H.C. Dube.Chapter-21-Leaf Spots and Blights, page-312]
49. [Ans.(d). All the above Source-Modern Plant Pathology by H.C. Dube.Chapter-19-Plant Disease Management (Plant Disease Control) II: Cure, page-276]
50. [Ans.(c). Cross Resistance Source-Modern Plant Pathology by H.C. Dube.Chapter-19-Plant Disease Management (Plant Disease Control) II: Cure, page-277]
51. [Ans.(d). All the above Source-Plant Pathology by G. N. Agrios.Chapter-9-Control of Plant Diseases, page-315]
52. [Ans.(d). None of the above Source-Plant Pathology by G. N. Agrios.Chapter-9-Control of Plant Diseases, page-320]
53. [Ans.(d). 95-100C Source-Plant Pathology by G. N. Agrios.Chapter-9-Control of Plant Diseases, page-310]
54. [Ans.(d). All the above Source-Plant Pathology by G. N. Agrios.Chapter-9-Control of Plant Diseases, page-319]
55. [Ans.(d). Strobilurin induce plant defence Source-Modern Plant Pathology by H.C. Dube.Chapter-19-Plant Disease Management (Plant Disease Control) II: Cure, page-274]
56. (**Ans: B**, Mutagenic Agents Source: Elements of plant virology, Page 65)
57. (Ans: E, All the above Source: Elements of plant virology, Page 207)
58. (**Ans: D**, 1-C, 2-D, 3-C, 4-B, 5-A Source: Elements of plant virology, Page 210)
59. (**Ans: D**, PVX Source: G.N.Agrios, 758)
60. (**Ans: B**, PVY Source: Elements of plant virology, Page 206)
61. (**Ans: D**, BOTH B and C Source: Elements of plant virology, Page 206)
62. (**Ans: D**, RTV Source: Elements of plant virology, Page 211)
63. (**Ans: D**, Both a and C Source: Elements of plant virology, Page 222)
64. (**Ans: C**, Cultural Control Source: Elements of plant virology, Page 198)

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CHAPTER 12

LABORATORY TECHNIQUES IN PLANT PATHOLOGY

1. In ……. serological detection technique, the antibodies and antigens are mixed in solution in tubes or in drops on a petri dish.
   A. Gel diffusion test B. Precipitin test
   C. Agglutination reaction test D. Both a and c
2. The antiserum of the animal to which antigen is injected contains.....……
   A. Monoclonal antibodies B. Polyclonal antibodies
   C. Both a and b D. None of the above
3. In hybridoma technology, the antibody producing cell is fused with …….. to produce monoclonal antibodies.
   A. Mouse myeloma cell B. Rabbit RBC
   C. Both a and b D. None of the above
4. In …… ELISA the antibodies are added first.
   A. Direct ELISA B. Indirect ELISA
   C. Both and b D. None of the above
5. …….. is another serological technique used for finding a virus present in very low concentrations
   A. Immunosorbent electron microscopy B. ELISA
   C. Immunofluorescent staining technique D. Both A and C
6. Which dye is used in immunofluorescent staining technique?
   A. Ethidium bromide B. SYBR green dye
   C. Fluorescein isothiocyanate D. Lactophenol cotton blue
7. …… is used to detect and quantify cDNA-RNA or cDNA-DNA hybrids.
   A. Autoradiography
   B. Liquid scintillation technique
   C. Electrophoresis D. Both A and B
8. …… works on the principle of moist heat sterilization
   A. Hot air oven B. Laminar air flow
   C. Autoclave D. None of the above
9. The temperature required for dry heat sterilization is …… for 1 hour exposure.
   A. 180 degrees B. 120 degrees
   C. 160 degrees D. 100 degrees

10. Dry heat sterilization kills microbes by ……..?
A. Coagulating and denaturing of enzymes B. Oxidation
C. Both a and b D. None of the above
11. Moist heat sterilization kills microbes by …….?
A. Coagulating and denaturing of enzymes B. Oxidation
C. Both a and b D. None of the above
12. Most autoclaves and pressure cookers operate at ……, at which the minimum holding period for sterilization is …….
A. 100p C, 10 minutes B. 150 p C, 5 minutes
C. 121p C, 15 minutes D. 180p C, 1 hour
13. …… is used to obtain monosporic culture.
A. Water agar B. Potato dextrose agar
C. Nutrient agar D. V-8 agar
14. Penicillin is effective against …….?
A. Gram positive bacteria B. Gram negative bacteria
C. Both A and B D. None of the above
15. Streptomycin is effective against which bacteria?
A. Gram positive bacteria B. Gram negative bacteria
C. Both A and B D. None of the above
16. Neomycin is effective against which bacteria?
A. Gram positive bacteria B. Gram negative bacteria
C. Both A and B D. None of the above
17. Chloramphenicol is active against which bacteria?
A. Gram positive bacteria B. Gram negative bacteria
C. Both A and B D. None of the above
18. In KOH solubility test, if a mucoid thread can be with the loop it is…….
A. Gram positive bacteria B. Gram negative bacteria
C. Both A and B D. None of the above
19. The Mistifier technique for nematode extraction was described by?
A. Seinhorst B. Baermann
C. Alwine D. Christian
20. Viroids can be determined by …….?
A. Return polyacrylamide gel electrophoresis
B. Reverse transcription polymerase chain reaction
C. Real time PCR D. All of the above
21. What is the sensitivity of PCR?
A. 1-10 ng/ml B. 1-10 mg/ml
C. 1-10 ug/ml D. 1-10 pg/ml

22. Which stain is used to know the presence of MLOs?
A. Bromophenol blue B. SYBR green
C. Ethidium bromide D. Dienes stain

23. …… is used to determine the presence and viability of fungal spores.
A. Fluorescein diacetate assay B. Dienes stain
C. Both A and B D. None of the above

24. Which enzyme is used for tagging antibodies in ELISA?
A. Alkaline phosphatase B. Horseradish peroxidase
C. Both A and B D. None of the above

25. ……ELISA involves antibodies from two different species of animals.
A. DAS ELISA B. DAC ELISA
C. PTA ELISA D. TAS ELISA

26. In DBIA …… is used as solid support for immobilization of both the antigens and antibodies.
A. Nitrocellulose membrane B. Polyvinylidene difluoride
C. Whatman filter paper D. Both A and B

27. Which type of PCR allows simultaneous detection of viruses, phytoplasma and nematodes?
A. Real time PCR B. Singleplex PCR
C. Nested PCR D. Multiplex PCR

28. Which PCR is used for the detection of viable plant pathogens?
A. Bio PCR B. Real time PCR
C. Gradient PCR D. Multiplex PCR

29. …… is a promising tool for enhancement of detection of plant pathogens and revealing the point mutations in the wild types of causative agents.
A. Polymerase Chain reaction B. Ligase Chain reaction
C. Nuclear chain reaction D. All of the above

30. Western blotting is a highly sensitive method for the detection of…….?
A. DNA B. RNA
C. Proteins D. None of the above

31. The relation between time required for sterilization and temperature required is
A. Directly proportional B. Inversely proportional
C. No relation D. None of the above

32. Which type of heat requires higher temperature and for longer duration?
A. Dry heat B. Moist heat
C. Flame heat D. Both A and B

33. Peak emission of NUV fluorescent lamp
A. 583 nm B. 280 nm
C. 360 nm D. 300 nm

34. Immunosorbent assay plates are made of
A. Plastic B. Polystyrene
C. Polyvinyl D. Polypropylene

35. Synonym of dot blot
A. Microarray B. Macroarray
C. Molecular beacon
D. NASH (Nucleic acid Spot Hybridization)

36. How is dot blot visualized?
A. Naked eye
B. Gel documentation system
C. Microscopy
D. UV spectrophotometer

37. Match correctly the selective media

a)	Rhizoctonia	i.	Nash and Synder media
b)	Fusarium	ii.	MacConkey Agar
c)	Gram negative bacteria	iii.	Mannitol salt Agar
d)	Gram positive bacteria	iv.	Thiophanate methyl agar

A. a – iii; b – ii; c – iv; d – i
B. a – iv; b – i; c – ii; d – iii
C. a – i; b – ii; c – iii; d – iv
D. a – ii; b – iv; c – i; d – iii

38. Single molecule sequencing is also called
A. 1st generation sequencing
B. 2nd generation sequencing
C. 3rd generation sequencing
D. 4th generation sequencing

39. NASBA (Nucleic acid sequence-based amplification) amplifies
A. DNA B. RNA
C. Both DNA and RNA D. None

40. Main genetic marker of fungi
A. ITS B. IGS
C. RAPD D. COI

41. Most commonly used blocking solution in Western blotting
A. Tween 20
B. Phenylmethylsulfonyl fluoride (PMSF)
C. Bovine serum albumin (BSA)
D. Non- fat dried milk

42. Fixatives used in electron microscope
A. Glutaraldehyde B. Paraformaldehyde
C. Osmium tetraoxide D. All of the above

43. Short term preservation maintains the culture for
A. 6 months B. 9 months
C. 1 year D. 1 month
44. Silica gel method of preservation is mainly used for
A. Bacteria B. Sporulating fungi
C. Soil fungi D. Sclerotized fungi
45. Examples of cryoprotectants
A. Glycerol (10–15%) and dimethyl sulfoxide (5%)
B. Ethanol C. Tween 80
D. Sodium hydroxide
46. Which of the following is not true about dry heat sterilization?
A. Dry heat is an oxidation process
B. Sterilization takes place from the hot air surrounding the object
C. Many bacteria in desiccated vegetative state can survive dry heat
D. Heat conduction by dry heat is slower than the moist heat
47. The major advantage of jacketed types of autoclave is that?
A. The duration of heating is comparatively less
B. B) Condensation of moisture on items is not there
C. Both (a) & (b) D. None of the above
48. Autoclaving may result in
A. Change in the pH OF the media sterilized
B. Partial hydrolysis of carbohydrates in culture media
C. Change in nature of proteins
D. All the above
49. Which of the following filters may shed fibres or alkalis during filter sterilization?
A. Asbestos filters B. Sintered glass filters
C. Membrane filters D. None of the above
50. Which of the following gases are used for sterilization of plant materials to be used in media?
A. Propylene oxide B. Carbon dioxide
C. Nitrogen dioxide D. All the above
51. pH of the culture media is generally adjusted ?
A. Before autoclaving B. After autoclaving
C. After autoclaving and cooling D. None of the above
52. Which of the following methods can be used to induce sporulation in *Helminthosporium* and *alternaria*
A. Filter paper method B. Grass -leaf method
C. Both A and B D. None of the above
53. Which of the following is a valid method of storing fungi for long term?
A. Storing under mineral oil B. Storing in sterile water
C. Storing in liquid paraffin D. All the above

54. Which of the following act as cryoprotectant for storing fungal culture in Liquid nitrogen?
A. Dimethyl sulfoxide B. 10 % glycerol
C. Both A and B D. None of the above

55. In phase contrast microscope the bacteria can be visualized without staining because of the differences in the ……between bacterial cell and surrounding medium?
A. Refractive index B. Numerical aperture
C. Transparency D. Consistency

56. The resolution limit of a light microscope using visible light is above?
A. 200 nm B. 300nm
C. 400nm D. 600 nm

57. Micro titre plate is used for which of the following virus detection methods?
A. ISEM B. PCR
C. ELISA D. None of the above

58. Acidic dyes are used to stain basic cell constituents like cytoplasm, while basic dyes are used to stain which of the following acidic cell constituents?
A. Nuclei B. Meta chromatic granules
C. Both A and B D. None of the above

59. The surface of the bacteria is normally……charged, but at lower pH bacteria becomes…….. charged ?
A. Negatively, positively B. Positively, Negatively
C. Remain same
D. None of the above

60. A rapid method of distinguishing Gram positive and negative bacteria using 3% KoH was proposed by
A. Suslow *et al* (1982) B. Buell and Weston (1947)
C. Babu *et al* (1976) D. None of the above

61. The technique of negative staining for electron microscopy was developed by
A. Kauche and co- worker B. Williams and Wycoff (1945)
C. Brenner and Home (1959) D. Brakke (1951)

62. Who developed meristem tip culture technique for obtaining virus free planting materials?
A. Morel and Martin (1952) B. Williams and Wycoff (1945)
C. Brenner and Home (1959) D. Kassanis (1954)

63. Observation of soil microorganism's *insitu* can be done by?
A. Fluorescence microscopy B. Stage microscopy
C. Both A and B D. None of the above

64. Fungicide evaluation can be done by?
A. Spore germination test B. Poison food technique
C. Disc impregnation method D. All the above

65. Which of the following solutions are used for soil -less cultivation of plants in laboratory?
A. Hoagland solutions B. Nutrient Broth
C. Oagland solution D. None of the above

66. Which of the following equipment is used for continuous culturing micro organisms in growth phase ?
A. Turbidostat B. BOD incubator
C. Environment chamber D. Hygrochamber

67. Which of the following detection techniques gives the quantitative value of the pathogen present in the sample?
A. PCR B. Real time PCR
C. ELISA D. Both A & B

68. Which of the following is not used in PCR?
A. Probe B. Polymerase
C. Primer D. Mgcl2

69. Which of the following cannot be detected by serological tests?
A. Viroid B. Virus
C. Fungi D. All the above

70. Who discovered storage of culture under mineral oil?
A. Suslow *et al*. (1982) B. Buell and Weston (1947)
C. Babu *et al*. (1976) D. None of the above

71. In bright field microscope the microscope field (the area under observation) is —— and the microorganism appears———?
A. Bright and dark B. Dark and bright
C. Bright and bright D. None of the above

72. Presence and viability of fungal spore can be determine by –
A. Dienes stain
B. Fluorescein diacetate assay(FDA)
C. Both
D. None of the above

73. Which technique used for diagnosis of MLO?
A. Dienes stain
B. Fluorescein diacetate assay(FDA)
C. Both A & B D. None of the above

74. The technique used for the detection of more than one pathogen present in a particular plant and soil sample in a single assay is
A. Multiplex PCR B. Real time PCR
C. Microarray based technique D. All of the above

75. The PCR based method in which antibody is used for pathogen diagnostics?
A. RFLP B. RAPD
C. Immune capture PCR D. ISEM

76. The diagnostic test used for identification of gram positive and gram negative bacteria is?
A. Gram staining process B. 3% KOH reaction
C. Kind of enzyme produced D. Both A & B

77. Serological test in not used in detection of
A. Virus B. Bacteria
C. Fungus D. Viroid

78. The method used for detection of viroid is
A. R-PAGE B. RT-PCR
C. Temperature gradient gel electrophoresis
D. All of the above

79. Reverse transcription RT-PCR successfully detect the presence of
A. Virus B. Viroid
C. Viruliferous Vector D. All of the above

80. Most common enzyme for tagging antibody used in ELISA
A. Horseradish peroxidase (HRPO) B. Alkaline phosphatase (AP)
C. Both A & B D. Not mention above

81. Match the following

MICROSCOPE	MAXIMUM MAGNIFICATION
A.Dissecting microscope	1)10000-1000000X
B.Fluorescent microscope	2)500000-1000000X
C.TEM	3)1500X
D.SEM	4)10-50X

82. Pure culture of bacteria can be obtained by?
A. Streak plat technique B. Single spore isolation method
C. Pour plat technique D. Both A & C

83. What is the pH requirement of fungus?
A. 6.0-6.5 B. 7.0
C. 8.0 D. 4.5-5.5

84. What is the most common absorbance or reading taken from ELISA?
A. 400nm B. 405nm
C. 410nm D. 415nm

85. What is the most commonly used buffer in electrophoresis?
A. Tris acetate EDTA B. Tris acetate borate
C. Agaragar D. Both A & B

86. Most suitable size of membrane filter for filter sterilization is?
A. 0.11micron B. 0.22 micron
C. 0.33 micron D. 0.44 micron

87. Statement 1: lactophenol cotton blue has three components
Statement 2:- phenol kill living organism
Statement 3:-lactic acid preserve fungal structure
Statement 4:- stain chitin in the fungal cell wall
A. All the statement are true
B. Only statement 1& 2 are true
C. Only statement 3& 4 are true
D. All of them are incorrect

88. Western blotting term is given by?
A. Clark and adams
B. Twobin
C. Burnett
D. None of the above

89. What are the annealing and denaturation temperature in PCR?
A. 50 degree & 90 degree
B. 55 degree & 95 degree
C. 80 degree & 100 degree
D. 30 degree & 70 degree

90. RT PCR useful for detection of?
A. DNA virus
B. RNA virus
C. Both A and B
D. Fungus

91. Which disease caused by low temperature?
A. Russetting of apple fruit
B. Cracking and peeling of bark
C. Late frost tip necrosis
D. All of the above

92. What are the diseases caused by high temperature?
A. Sunsclad on flashy fruit
B. Water core of the apple
C. Blossom end rot of citrus
D. All of the above

93. Black heart of potato caused by?
A. Low oxygen
B. High temperature
C. Both A & B
D. Pathogen

94. Which causes silver leaf of plant?
A. Ethylene
B. Peroxyacyl nitrate(PAN)
C. Both A and B
D. Mustard gas

95. Which is the most toxic pollutant for plant and its tolerance level?
A. PAN at 1.3 ppm
B. Hydrogen fluoride at 1.00ppm
C. Ozone at 0.1-0.3 ppm
D. All of them

96. Khaira disease caused by
A. B deficiency
B. Zn deficiency
C. Cu deficiency
D. S deficiency

97. Buttoning of cauliflower caused by
A. Zn deficiency
B. N deficiency
C. B deficiency
D. Ca deficiency

98. Hollow stem of cauliflower caused by
A. Zn deficiency B. N deficiency
C. B deficiency D. Ca deficiency

99. Top sickness of tobacco caused by
A. Zn deficiency B. N deficiency
C. B deficiency D. Ca deficiency

100. Sand drawn disease of tobacco caused by
A. B deficiency B. Mn deficiency
C. Mg deficiency D. Ca deficiency

101. Sulphur toxicity caused the disease
A. Cotton rust B. Red leaf of onion
C. Pansukh disease of rice D. None of the above

102. White tip of maize caused by
A. Zn deficiency B. B deficiency
C. N deficiency D. None of them are correct

103. Which is the trap crop for broomrape?
A. Marigold B. Flex
C. Mustard D. None of the above

104. The sensitivity of ELISA can be enhanced by
A. Steptavidin-biotin system
B. Conjugate with luciferase and flurescent substrate
C. Luciferin(florescent ELISA)
D. All of the above

105. Which of the following true about electron microscopy?
A. Thin and dry specimen required
B. Image is obtained in phosphorescent screen
C. Electron beam must pass through the vacuum chamber
D. All of the above

106. Degree of scattering in transmission electron microscope is a function of?
A. Wavelength of electron beam used
B. No of atoms that lies in the electron beam
C. No and mass of the atoms that lies in the electron path
D. Mass of the electron lies in the path

107. Negative staining is used for examining?
A. Virus particle B. Protein molecule
C. Bacteria flagella D. All of the above

108. Which among them getting three dimensional picture of the specimen?
A. Transmission electron microscope
B. Scanning electron microscope
C. Compound microscope
D. Simple microscope

109. The secondary electron radiated back in scanning microscope is collected by
A. Specimen B. Anode
C. Vacuum chamber D. Cathode

110. Where do we obtained obtain the magnified image of the specimen in SEM?
A. Cathode ray tube B. Anode
C. Scanning generator D. Phosphorescent screen

111. Which of the following technique are used in TEM for observation of the cell structure?
A. Negative screening B. Shadow casting
C. Ultrathin sectioning D. All of the above

112. Which is the best microscope for observation of living cell?
A. Simple microscope B. SEM
C. TEM
D. Phase contrast microscope

113. Wavelength of UV light used in the laminar air flow
A. 100nm-200nm B. 210-300nm
C. 310-400nm D. 410-500nm

114. Which is the common source of nitrogen in the culture media?
A. Sugar B. Agar
C. Ammonium sulphate D. Beef extract

115. Edema appears as numerous small bumps on the lower side of leaves or on stems caused by
A. Excess temperature B. Excess moisture
C. Excess watering D. Both B & C

116. Etiolation caused by
A. Excess light B. Light deficiency
C. Low temperature D. High temperature

117. Ethylene an air pollutant may be toxic to the plant at which concentration?
A. 0.01 PPM B. 0.05 PPM
C. 0.10 PPM D. 0.20 PPM

118. A biochemical technique used mainly in immunology to detect the presence of an antibody or antigen-
A. ELISA B. Latex Agglutination test
C. Ouchterlony double diffusion test D. None of the above

119. Fluorescent dyes used in staining cells of seed borne plant virus-
A. Acridine orange B. Glycine
C. Methyl blue D. None of the above

120. Proteins with an immune response produced by cells found in lymphatic tissues-
A. IgM B. IgG
C. Acridine orange D. None of the above

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CHAPTER 12
LABORATORY TECHNIQUES IN PLANT PATHOLOGY

1. **Ans. B**. Precipitin test (page- 745, G.N. Agrios, 5thedition)
2. **Ans. B**. Polyclonal antibodies (page- 744, G.N. Agrios, 5th edition)
3. **Ans. A**. Mouse myeloma cell (page- 744, G.N. Agrios, 5th edition)
4. **Ans. A.** Direct ELISA (page- 746, G.N. Agrios, 5th edition)
5. **Ans. D**. Both a and c (page- 747, G.N. Agrios, 5th edition)
6. **Ans. C**. Fluorescein isothiocyanate (page- 747, G.N. Agrios, 5th edition)
7. **Ans. D**. Both a and b (page- 752, G.N. Agrios, 5th edition)
8. **Ans. C**. Both a and b (page- 752, G.N. Agrios, 5th edition)
9. **Ans. A.** 180 degrees (page- 7, Plant disease diagnosis, Sileshi)
10. **Ans. B**. Oxidation (page- 7, Plant disease diagnosis, Sileshi)
11. **Ans. A.** Coagulating and denaturing of enzymes (page- 7, Plant disease diagnosis, Sileshi)
12. **Ans. C**. 121p C, 15 minutes (page-7, Plant disease diagnosis, Sileshi)
13. **Ans. A**. Water agar (page- 13, Plant disease diagnosis, Sileshi)
14. **Ans. A**. Gram positive bacteria (page- 17, Plant disease diagnosis, Sileshi)
15. **Ans. B**. Gram negative bacteria (page- 17, Plant disease diagnosis, Sileshi)
16. **Ans. A**. gram positive bacteria (page- 17, Plant disease diagnosis, Sileshi)
17. **Ans. C**. Both a and b (page-17, Plant disease diagnosis, Sileshi)
18. **Ans- B**. Gram negative bacteria (page- 27, Plant disease diagnosis, Sileshi)
19. **Ans. A**. Seinhorst (page- 29, Plant disease diagnosis, Sileshi)
20. **Ans. D**. All of the above (page-2, Plant pathology, M.K. Yadav)
21. **Ans- D**. 1-10 pg/ml (page- 4, Plant pathology, M.K. Yadav)
22. **Ans. D**. Dienes stain (page- 42, Plant Pathology, Mann, Kashyap, Kang)
23. **Ans. A**. Fluorescein diacetate assay (page- 42, Plant Pathology, Mann, Kashyap, Kang)
24. **Ans. C**. Both a and b (page- 43, Plant Pathology, Mann, Kashyap, Kang)
25. **Ans. D.** TAS ELISA (page- 43, Plant Pathology, Mann, Kashyap, Kang)
26. **Ans. C**. Both a and b (page- 44, Plant Pathology, Mann, Kashyap, Kang)
27. **Ans. D.** Multiplex PCR (page- 45, Plant Pathology, Mann, Kashyap, Kang)
28. **Ans. A**. Bio PCR (page- 45, Plant Pathology, Mann, Kashyap, Kang)
29. **Ans. B**. Ligase Chain Reaction (page- 45, Plant Pathology, Mann, Kashyap, Kang)

30. **Ans. C**. Proteins (page- 44, Plant Pathology, Mann, Kashyap, Kang)

31. **Ans. B**. Inversely proportional (Source: JB, Sinclair and OD, Dhingra, Basic Plant Pathology Methods, page: 2)

32. **Ans. A**. Dry heat (Source: JB, Sinclair and OD, Dhingra, Basic Plant Pathology Methods, page: 2)

33. **Ans. C**. 360 nm (Source: JB, Sinclair and OD, Dhingra, Basic Plant Pathology Methods, page: 14)

34. **Ans. B.** Polystyrene (Source: Clark, Immunosorbent Assays in Plant Pathology, Ann. Rev. Phytopathol., 1981, page: 87)

35. **Ans. D**. NASH

36. **Ans. A**. Naked eye

37. **Ans. B**.

38. **Ans. C**. 3rd Generation sequencing (Source: L. Chalupowicz *et al*., Diagnosis of plant diseases using the Nanopore sequencing platform, Plant Pathol., 2019, page 1)

39. **Ans. B**. RNA (Source: L. Chalupowicz *et al*., Diagnosis of plant diseases using the Nanopore sequencing platform, Plant Pathol., 2019, page 6)

40. **Ans. A**. ITS (Source: A Khakimov et al., Traditional and current-prospective methods of agricultural plant diseases detection: A review, IOP Conf. Ser.: Earth Environ. Sci. 2022, page: 7)

41. **Ans. D**. Non-fat dried milk (Source: SA, Brooks and U, Schumacher, SDS - PAGE and Western Blotting Techniques, Metastasis Research Protocols, 2001, page-147)

42. **Ans. D**. All the above (Source: GE Palade, A study of fixation for electron microscopy. The Journal of experimental medicine, 1952, page- 285)

43. **Ans. C**. 1 year (Source: KK Nakasone *et al*. Preservation and distribution of fungal cultures. Biodiversity of fungi: inventory and monitoring methods. Amsterdam: Elsevier Academic Press, 2004: Page: 38)

44. **Ans. B**. Sporulating fungi (Source: KK Nakasone *et al*. Preservation and distribution of fungal cultures. Biodiversity of fungi: inventory and monitoring methods. Amsterdam: Elsevier Academic Press, 2004: Page: 40)

45. **Ans. A.** Glycerol (10-15%) and dimethyl sulfoxide (5%) (Source: O. Prakash *et al.*, Practice and prospects of microbial preservation. *FEMS microbiology letters*, 2013, Page: 3)

46. **Ans. B.** Sterilization takes place from the hot air surrounding the object (Source: Laboratory techniques, Darshan &Gurvi reddy pg no :- 87)

47. **Ans. D.** None of the above **(**Source: Laboratory techniques, Darshan &Gurvi red pg no :- 88)

48. **Ans. D.** All the above **(**Source: Laboratory techniques, Darshan &Gurvi reddy pg no :- 88)

49. **Ans. A.** Asbestos filters (Source: Laboratory techniques ,Darshan &Gurvi reddy pg no :-90)

50. **Ans. A.** Propylene oxide (Source: Laboratory techniques, Darshan &Gurvi reddy pg no :- 93)

51. **Ans. A.** Before autoclaving (Source: Laboratory techniques, Darshan &Gurvi reddy pg no :- 97)

52. **Ans. C.** Both A and B (Source: Laboratory techniques, Darshan &Gurvi reddy pg no :- 200)

53. **Ans. D.** All the above (Source: Laboratory techniques, Darshan &Gurvi reddy pg no :- 206)

54. **Ans. D.** None of the above (Source: Laboratory techniques, Darshan &Gurvi reddy pg no :- 288)

55. **Ans. A.** Refractive index (Source: Laboratory techniques Darshan &Gurvi reddy pg no :- 289)

56. **Ans. A.** 200 nm (Source: Laboratory techniques, Darshan &Gurvi reddy pg no :- 300)

57. **Ans. C.** ELISA (Source: Laboratory techniques, Darshan &Gurvi reddy pg no :- 310)

58. **Ans. C.** Both A and B (Source: Laboratory techniques, Darshan &Gurvi reddy pg no :- 260)

59. **Ans. A.** Negatively, positively (Source: Laboratory techniques, Darshan &Gurvi reddy pg no :- 261)

60. **Ans. B.** Buell and Weston (Source: Laboratory techniques, Darshan &Gurvi reddy pg no :- 263)

61. **Ans. C.** Williams and Wycoff (1945) (Source: Laboratory techniques, Darshan &Gurvi reddy pg no :- 270)

62. **Ans. A.** Morel and Martin (Source: Laboratory techniques, Darshan &Gurvi reddy pg no :- 303)

63. **Ans. A.** Florescence microscopy (Source: Laboratory techniques, Darshan &Gurvi reddy pg no :- 310)

64. **Ans. D.** All the above (Source: Laboratory techniques, Darshan &Gurvi reddy pg no :- 321)

65. **Ans. A.** Hogland solutions **(**Source: Laboratory techniques, Darshan &Gurvi reddy pg no :- 370)

66. **Ans. B.** BOD incubator **(**Source: Laboratory techniques, Darshan &Gurvi reddy pg no :- 10)

67. **Ans. B.** Real time PCR (Source: Laboratory techniques, Darshan &Gurvi reddy pg no :- 301)

68. **Ans. A.** Probe **(**Source: Laboratory techniques, Darshan &Gurvi reddy pg no :- 310)

69. **Ans. A.** Viroid (Source: Laboratory techniques, Darshan &Gurvi reddy pg no :- 390)
70. **Ans. B.** Buell and Weston (1947) **(**Source: Laboratory techniques, Darshan &Gurvi reddy pg no :- 280)
71. **Ans. A.** Bright and Dark
72. **Ans. B**. Florescencein diacetate assay (FDA) **(**Source: A competitive vision of plant pathology page no-42)
73. **Ans. A.** Dienes stain **(**Source: A competitive vision of plant pathology page no-42)
74. **Ans. D.** All the above **(**Source: A competitive vision of plant pathology page no-51)
75. **Ans. C.** Immune capture PCR (Source: A competitive vision of plant pathology page no-51)
76. **Ans. D.** Both A and B
77. **Ans. D.** Viroid
78. **Ans. D.** All the above
79. **Ans. D.** All the above (Source: A competitive vision of plant pathology page no-53)
80. **Ans. C.** Both A and B
81. **Ans. A-4, B-3, C-1, D-2**
82. **Ans. D.** Both A and C (Source: Plant pathology for competitive exam page no-2)
83. **Ans. A**. 6.0-6.5 (Source: Plant pathology for competitive exam page no-2)
84. **Ans. B**. 405nm
85. **Ans. D.** Both A and B (Source: Plant pathology for competitive exam page no-4)
86. **Ans. B**. 0.22 micron (Source: Plant pathology for competitive exam page no-4)
87. **Ans. A.** All of them are true
88. **Ans. C.** Burnett (Source: Plant pathology for competitive exam page no-8)
89. **Ans. B**. 55p C and 95p C
90. **Ans. C.** Both A and B
91. **Ans. D**. All of the above (Source: plant pathology for competitive exam, 228)
92. **Ans. D**. All the above (Source: plant pathology for competitive exam, 228)
93. **Ans. C.** Both A and B
94. **Ans. B**. Peroxyacyl nitrate (PAN)
95. **Ans. C.** Ozone at 0.1 -0.3 ppm **(**Source: plant pathology for competitive exam, 228)
96. **Ans. B**. Zn deficiency
97. **Ans. B**. N deficiency
98. **Ans. C.** B deficiency
99. **Ans. C.** B deficiency
100. **Ans. C.** Mg deficiency
101. **Ans. C.** Pansukh disease of rice
102. **Ans. A.** Zn deficiency
103. **Ans. B**. Flex (Source: plant pathology competitive version, 231)
104. **Ans. D**. All the above (Source: plant pathology competitive vision)

105. **Ans. D**. All the above
106. **Ans. C.** No. and mass of the atom that lies in the electron path
107. **Ans. D**. All the above
108. **Ans. B**. Scanning electron microscope
109. **Ans. B**. Anode
110. **Ans. A.** Cathode ray tube
111. **Ans. D.** All the above
112. **Ans. D**. Phase contrast microscope
113. **Ans. B**. 210-300 nm
114. **Ans. C.** Ammonium sulphate (Source: plant pathology a competitive vision,175)
115. **Ans. D**. Both B and C (Source: GN agrios page no- 367)
116. **Ans. B**. Light defdiciency (Source: GN agrios page no -368)
117. **Ans. B**. 0.05 ppm (Source: GN AGRIOS page no-369)
118. **Ans. A.** ELISA (page no.-279)
119. **Ans. A.** Acridine orange (page no.-279)
120. **Ans. B**. IgM (page no.-83)

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