

**E-5**

**PROCUREMENT OF GOODS  
THROUGH  
REQUEST FOR QUOTATION  
(RFQ)/SHOPPING PROCEDURES**

*(For Contracts valued less than the  
equivalent of US \$100,000 each)  
(Procurement Bidding process)*

**February 2022**

**REQUEST FOR QUOTATIONS**  
**Procurement of Goods under RFQ/Shopping Procedures**  
**Procurement Notice**

**Purchaser:** ICAR - Indian Agricultural Statistics Research Institute (IASRI), Library Avenue, Pusa, New Delhi-110 012.

**Email:** [cps.iasri@icar.gov.in](mailto:cps.iasri@icar.gov.in) Web Site: [www.iasri.icar.gov.in](http://www.iasri.icar.gov.in)

**Contract title: Supply, installation, and commissioning of Upgrading LAN network with latest wi-fi and UPS**

**RFQ No: 36(33)/2021-C.P.S**

**Date: 27-February 2023**

**Applicable Procurement Regulations Date:** World Bank Guidelines January 2011, Revised July 2014

1. The Government of India has received a Loan (No. 8776-IN) from the International Bank for Reconstruction and Development in various currencies towards the cost of National Agricultural Higher Education Project (NAHEP) and it is intended that part of the proceeds of this credit/loan will be applied to eligible payments under the contracts for which this Request for Quotation is issued. The Indian Agricultural Statistics Research Institute (IASRI), Library Avenue, Pusa, New Delhi-110 012, invites quotations from eligible bidders for the following goods:-

Sr. No	Brief Description of the Items	Quantity (Indicative)	Delivery Period*	Place of Delivery
I.	<b>Upgrading of LAN network with latest wi-fi upgrading, switch room and UPS<sup>#</sup></b>	1 set <sup>#</sup>	30 days	ICAR-IASRI, New Delhi

# Detail List of items available in Form 2 (Requirement and Technical Specification)

*[\* Where ISI certification marked goods are available in market, purchaser should generally limit the procurement to goods with those or equivalent marking only.]*

2. This Procurement notice includes the terms and conditions applicable to submission of quotations; criteria for qualification, evaluation, and for award of supply order(s); and relevant forms to be filled by the bidders. Implementing Agency has not issued a separate RFQ document for this purchase. The Procurement notice including the terms and conditions etc. can be downloaded free of cost from the website [www.iasri.icar.gov.in](http://www.iasri.icar.gov.in). In such cases the bidder would

be responsible for ensuring that any addend available in website is also downloaded and incorporated.

3. Quotations shall be submitted to the address mentioned below on or before 14:30 hrs. **(Indian Standard Time)** on 09-March 2023, on all working days, duly written on the cover of envelop as **“Request for Quotation (RFQ) Supply, installation, and commissioning of Upgrading LAN network with latest wi-fi and UPS at ICAR- IASRI Library Avenue, PUSA, New Delhi -110012:”**.

Dr. Droga Singh Auditorium, Ground Floor, Computer Building,  
ICAR-Indian Agricultural Statistics Research Institute  
Library Avenue, Pusa, New Delhi -110012

The Quotations will be opened at the same above address at 15:00 hrs. Late submission of Quotations will not be considered and treated as rejected.

4. If the Purchaser’s office happens to be closed on the date of opening of the Quotations as specified, the Quotations will be opened on the next working day at the same time and venue.

5. Other details can be seen in the RFQ document. The Purchaser shall not be held liable for any delays due to postal or any other reasons whatsoever. A Bidder requiring any clarification of the RFQ Document may visit the office of the Purchaser at the address mentioned at para 4 above or by email.

**RFQ No: 36(33)/2021-C.P.S**

Date: 16-February-2023

### **Terms and Conditions**

1. **Eligibility:** A Bidder (a) shall not participate in more than one Quotation; (b) shall not have conflict of interest as defined in the Bank’s Procurement Regulations; and (c) should not have been (i) temporarily suspended or debarred by the World Bank Group in compliance with the Bank’s Anti-Corruption Guidelines and its Sanctions Framework
2. **Clarifications & Amendments:** If the Purchaser receives any request for clarification of this RFQ Document, it will upload its response together with any amendment to this document, on the [www.isari.icar.gov.in](http://www.isari.icar.gov.in) portal for information of all Bidders. Bidders should check on the portal, for any amendments to the terms and conditions.
3. The Quotation shall comprise the following:
  - (a) Letter of Quotation.

- (b) Delivery Period Offered: List of Goods & Related Services indicating Bidder's offered delivery period in the prescribed Form.
- (c) Technical Specifications: confirmation that the offered Goods and Related Services conform to the required specifications.
- (d) Evidence in accordance with Clause 6 establishing Bidder's qualifications to perform the contract, if its quotation is accepted.
- (e) Performance Statement<sup>1</sup> of supplies of similar goods made during the last 3 years, in the prescribed Format;
- (f) Complete address and contact details of the Bidder having the following information:

Name of Firm

Address for communication

Telephone No(s): Office

Mobile No.

Facsimile (FAX) No.

Electronic Mail Identification (E-mail ID)

- (g) Price Schedule (using the Schedule with the RFQ document)

#### 4. Quotation Prices

- (a) The contract shall be for the full quantity for all items or for full quantity of each item, as specified in the Price Quotation Form.
- (b) All duties, taxes and other levies payable on the raw materials and components shall be included in the total price.
- (c) GST and any other taxes, which will be payable on the goods at the time of invoicing in connection with the sale, shall be shown separately. If these are only stated to be extra, such quotations are unreliable and shall be rejected. Wherever these taxes are not shown, these will be assumed to have been included in the quoted price.
- (d) The rates quoted by the bidder shall be fixed for the duration of the contract and shall not be subject to adjustment on any account.
- (e) The Prices shall be quoted in Indian Rupees only.

5. **Conformity of Goods:** Bidder shall furnish, documentary evidence that the Goods **conform** to the technical specifications and standards, as relevant for example catalogue, warranty/ guarantee etc. of the manufacturer.

#### 6. Qualification of the Bidder:

- (a) Bidder should have supplied goods of similar type (& capacity) up to at least 80% quantity in any one of last 3 years. Details of supplies made during the last 3 years shall be submitted in the specified Proforma. At least 40 % of the quantity in case of equipment offered for supply should have been in successful operation for at least one year as on date of quotation opening.

---

<sup>1</sup> Purchaser may delete this requirement in case of simple and regular off the shelf items.

(b) Supplies for any particular item in each quotation should be from one manufacturer only. Quotations offering supplies from different manufacturers for the same item in the quotation will be treated as non-responsive.

7. **Validity of Quotation:** Quotation shall remain valid for a period not less than 45 days after the deadline date specified for submission.

8. **Signing of Quotations:** The name and position held by each person signing the quotation and related documents must be typed or printed below the signature.

9. **Quotation Submission:** The complete Quotation as mentioned in para 3 above, shall be filled, signed and submitted along with the Price Schedules that shall be furnished using the Forms available in this document.

10. Warranty period shall be 36 months from the date of acceptance of the Goods.

11. The Purchaser reserves the right to terminate maintenance and repairs contract, after warranty period, at any time without assigning any reasons and the Supplier cannot claim any compensation in this respect

12. **Opening and Evaluation of Quotations:** The Quotations will be opened and Brief of quotation opened will be uploaded on [www.iasri.icar.gov.in](http://www.iasri.icar.gov.in). The evaluation of the quotation are

(a) The Purchaser shall examine the quotation to determine whether the quotation, a) has been properly signed (Clause 8 ); b) meets the eligibility criteria (Clause 1); (c) conforms to all terms, conditions, technical specifications, warranty/guarantee etc.; and (d) the bidder has accepted the delivery schedule (Purchaser's Requirement Form 1).

(b) Only Quotations that are substantially responsive to the RFQ document and meet all Qualification Criteria shall qualify.

(c) The evaluation shall be based on the total price of Goods and Related services at project site including GST and any other taxes, which will be payable on the finished goods at the time of invoicing.

13. **Award of contract:** The Purchaser will award the contract to the bidder whose quotation has been determined to be substantially responsive and who has offered the lowest evaluated quotation price.

(a) Notwithstanding the above, the Purchaser reserves the right to accept or reject any quotations and to cancel the bidding process and reject all quotations at any time prior to the award of contract.

(b) The bidder whose quotation is accepted will be notified of the award of contract by the Purchaser prior to expiration of the quotation validity period. The terms of the accepted offer shall be incorporated in the supply order (sample form attached).

(c) 100% Payment shall be made within 60 days as per following :

a After delivery 80% payment, After installation 10% and after commissioning 10% of the goods and acceptance certificate issued by the purchaser.

b Payment of GST and other taxes payable for the goods at the time of invoicing, although already included in the total cost, will be at actuals.

# Quotation Forms

## Letter of Quotation

*The Bidder must prepare the Letter of Quotation on stationery with its letterhead clearly showing the Bidder's complete name and address. The italicized text is for Bidder's guidance in preparing these forms and shall be deleted from the final products.*

RFQ No.:

Our Reference: No.

Dated

To:

Mayank Pundir

AAO, CP&EMS

Room# 507, Administration cum Training Block

ICAR-Indian Agricultural Statistics Research Institute

Library Avenue, Pusa, New Delhi-110012

Subject: Request for Quotation (RFQ) for Supply, installation, and commissioning of Upgrading LAN network with latest wi-fi and UPS

Sir,

1. We, the undersigned, hereby submit our Quotation. In submitting our Quotation, we make the following declarations:

- (a) **No reservations:** We have examined and have no reservations to the RFQ Document;
- (b) **Conformity:** We offer to supply in conformity with the RFQ Document and in accordance with the Delivery Schedules specified in the Schedule of Requirements the following Goods and Related Services *as mentioned in RFQ*.
- (c) The total price of our Quotation, including any unconditional discounts offered is: Total price of the Quotation [***insert the total price of the quotation including GST and any other taxes, which will be payable on the finished goods, in words and figures***];
- (d) **Commissions, gratuities and fees:** We have paid, or will pay the following commissions, gratuities, or fees with respect to the Bidding process or execution of the Contract: [*insert complete name of each Recipient, its full address, the reason for which each commission or gratuity was paid and the amount and currency of each such commission or gratuity. If none has been paid or is to be paid, indicate "none."*]
- (e) **Quotation Validity Period:** Our Quotation shall be valid for the period of 30 days, from the deadline fixed for the Quotation submission;
- (f) **Eligibility:** We meet the eligibility requirements and have no conflict of interest, we are not participating in more than one quotation in this bidding process, and we have not been temporarily suspended or debarred by the World Bank.



(g) **Fraud and Corruption:** We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in any type of corrupt, fraudulent, collusive, coercive, or obstructive practices.

Yours faithfully,

Authorized Signature

Name & Title of Signatory \_\_\_\_\_

In the capacity of [insert legal capacity of person signing the Letter of Quotation]

Name of Bidder \_\_\_\_\_

Address \_\_\_\_\_

Dated on \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_ [insert date of signing]

## FORMAT OF QUOTATION

S.No	Brief description of goods/ equipment and Specification as per Form2	Qty	Unit	Quoted Unit Rate <sup>2</sup> at destination in Rs.	GST*	*Total Price per line item at Destination - inclusive of discounts, all taxes and duties
1.	Wireless Manager/Controller	01	Nos.			
2.	In Room AP	28	Nos.			
3.	Indoor AP	03	Nos.			
4.	High Density Indoor AP	7	Nos.			
5.	12 or Higher port PoE Switch	04	Nos.			
6.	48 port PoE Switch	05	Nos.			
7.	96 or Higher port PoE Switch	01	Nos.			
8.	10G Multi Mode SFP	60	Nos.			
9.	10G Single Mode SFP	40	Nos.			
10.	48 Core Single mode (9/125µm) G652 Fiber optic Cable	5150	Nos.			
11.	6 Core Single mode (9/125µm) G652 Fiber optic Cable	1440	Nos.			
12.	6 Core Multimode (50/125µm) Fiber optic Cable	560	Nos.			
13.	48F, 1U Rack Mount Fiber Enclosure (LIU) including Splice Trays and Adapter Strips, OS2	4	Nos.			
14.	24F, 1U Rack Mount Fiber Enclosure (LIU) including Splice Trays and Adapter Strips, OS2	9	Nos.			
15.	24F, 1U Rack Mount Fiber Enclosure (LIU) including	1	Nos.			

<sup>2</sup> Any unconditional discounts if offered, shall be specified in this column along with the unit rates. <sup>3</sup> Indicate each applicable tax separately.

	Splice Trays and Adapter Strips, OM4					
16.	12F, 1U Rack Mount Fiber Enclosure (LIU) including Splice Trays and Adapter Strips, OM4	3	Nos.			
17.	Fiber Patch Cords, LC-LC Duplex, Single mode OS2 Armored, 3MT	28	Nos.			
18.	Fiber Patch Cords, LC-LC Duplex, Multimode OM4 Armored, 3MT	8	Nos.			
19.	96 Core Fiber Optic Splice Closure	7	Nos.			
20.	CAT6A S-FTP LSZH CABLE	29	Nos.			
21.	Category 6A Shielded Keystone Outlet	374	Mtrs.			
22.	Cat6A Shielded LSZH Patch Cords for Rack & Workstation End	374	Mtrs.			
23.	Cat6A Unshielded LSZH Patch Cords for Uplink	4	Mtrs.			
24.	Cat6A Field Mount Modular RJ45 Plug	38	Nos.			
25.	24 Port, 1U Category 6 / 6A Staggered Patch Panel, Unloaded	10	Nos.			
26.	Face Plate, UK Style, Almond Color, Square with Shutters	168	Nos.			
27.	Back Box for Face Plate, UK Style	168	Nos.			
28.	42U Floor Mount Network Rack with Accessories	1	Nos.			
29.	12U Wall Mount Network Rack with Accessories	8	Nos.			
30.	HDPE Pipe 32 mm	5000	mtr			
31.	Conduit and channel 25 mm and 32mm	5000	mtr			
32.	32mm HDPE Pipe Joint Coupler	50	NOS			
33.	Fiber Rout Marker	40	NOS			
34.	Panduit label for patch cord	374	NOS			
35.	Velcro Tie 25 MM ROLL	10	Pkts			

36.	Cable Tie (Size 8inch)	50	Pkts			
37.	FERULE	412	NOS			
38.	01 KVA line interactive UPS	10	Nos			
39.	Implementation Charges including any other items like Tie, cable connectors etc. required for operation of the solution	Lumpsum	As per requirement			
		Total				

*\*Payment of GST and other taxes payable for the goods at the time of invoicing, although already included in the total cost, will be at actuals or the rate/amount of these taxes specified in the supply order, whichever is lower.*

We agree to supply the above goods in accordance with the technical specifications for a total contract price (including all taxes and duties) of Rs. ....(Amount in figures) (Rs... amount in words) within the period specified in the Request for Quotations.

We also confirm that the normal commercial warranty/guarantee of .....months shall apply to the offered goods.

We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf has engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices (as defined in the prevailing World Bank's sanctions procedures) in competing for or in performing the Contract.

**Signature of Bidder**

## PROFORMA FOR PERFORMANCE STATEMENT\*

Proforma for Performance Statement (for a period of last 3 years)

RFQ No. ^                      Date of opening \_\_\_\_\_ Time \_\_\_\_\_ Hours

Name of the Bidder \_\_\_\_\_

<u>Order placed by (full address of Purchaser)</u>	<u>Order No. and date</u>	<u>Description and quantity of ordered Goods/ equipment</u>	<u>Value of order</u>	<u>Date of completion of delivery</u>		<u>In case of Equipment, state if the equipment been satisfactorily functioning? (Attach a certificate from the Purchaser/Consignee)</u>
				As per contract	Actual	
1	2	3	4	5	6	8

\*This proforma shall be deleted if requirement of Performance Statement is deleted in Clause 3.

**Signature and seal of the Bidder**

## Form-1 Purchaser's Requirement

### LIST OF GOODS & RELATED SERVICES AND DELIVERY PERIOD

Line Item No.	Brief description of goods/ equipment and Related Services	Qty	Physical unit	Final Destination (Project site)	Desired Delivery Period for completion of supply from the date of the Contract	Bidder's offered Delivery Period <i>[to be provided by the Bidder]</i>
1	2	3	4	5	6	7
1.	Wireless Manager/Controller	01	Nos.	ICAR-IASRI, Library Avenue, Pusa, New Delhi - 110012	Delivery within 30 days	
2.	In Room AP	28	Nos.			
3.	Indoor AP	03	Nos.			
4.	High Density Indoor AP	7	Nos.			
5.	12 or Higher port PoE Switch	04	Nos.			
6.	48 port PoE Switch	05	Nos.			
7.	96 or Higher port PoE Switch	01	Nos.			
8.	10G Multi Mode SFP	60	Nos.			
9.	10G Single Mode SFP	40	Nos.			
10.	48 Core Single mode (9/125µm) G652 Fiber optic Cable	5150	Nos.			
11.	6 Core Single mode (9/125µm) G652 Fiber optic Cable	1440	Nos.			
12.	6 Core Multimode (50/125µm) Fiber optic Cable	560	Nos.			
13.	48F, 1U Rack Mount Fiber Enclosure (LIU) including Splice Trays and Adapter Strips, OS2	4	Nos.			
14.	24F, 1U Rack Mount Fiber Enclosure (LIU) including	9	Nos.			



33.	Fiber Rout Marker	40	NOS			
34.	Panduit label for patch cord	374	NOS			
35.	Velcro Tie 25 MM ROLL	10	Pkts			
36.	Cable Tie (Size 8inch)	50	Pkts			
37.	FERULE	412	NOS			
38.	01 KVA line interactive UPS	10	Nos			
39.	Implementation Charges including any other items like Tie, cable connectors etc. required for operation of the solution	Lumpsum	As per requirement			
		Total				

**Signature and seal of the Bidder**

Note:

1. All details should be filled in by Purchaser except for Colum 7.
2. Delivery Period offered by the Bidder should be filled in Column 7 by the Bidder.



**1. Requirement Overview**

ICAR-Indian Agricultural Statistics Research Institute (IASRI) is a pioneer institute of Indian Council of Agricultural Research (ICAR) undertaking research, teaching and training in Agricultural Statistics, Computer Application and Bioinformatics. ICAR-IASRI has been mainly responsible for conducting research in Agricultural Statistics and Informatics to bridge the gaps in the existing knowledge. It has also been providing education/ training in Agricultural Statistics and Informatics to develop trained human resources in the country. The research and education are used for improving the quality and meeting the challenges of agricultural research in newer emerging areas.

In the Premises of ICAR-IASRI there are total Six Buildings (3 buildings Admin Cum Trg Block, Sample Survey Block and Computer Building and 3 hostels/Guest House namely, International Training Hostel, Sukhatme Hostel and Panse Guest House. The institute is a part of the National Knowledge Network (NKN) of the Government of India and has 1Gbps internet bandwidth. All buildings and hostels are connected through the internet however, the existing IT infrastructure is inadequate to provide reliable connectivity to the official and hostel residents. Hence, strengthening the IT infrastructure and providing uninterrupted internet connection, ICAR-IASRI is planning to implement IT infrastructure for wired & wireless LAN at all the buildings. This setup implementation is meant to ensure seamless connectivity, faster data transfer throughout the ICAR-IASRI campus.

ICAR-IASRI is looking to provide high speed, reliable and robust wired and wireless connectivity on its campus across all buildings including Administrative Block, Computer block, Sample Survey Buildings and Hostels. ICAR-IASRI requires connectivity that will promote the research facilities to conduct studies on the technologies such as Big Data, Analytics, AI/ML. The proposed Network should be scalable to accommodate the future requirement.

**2. SCOPE OF WORK**

- (i) The bidder will carry out the work at the sites of premises of the ICAR-IASRI, Library Avenue, Pusa, New Delhi-110012 and will be responsible for total system integration and execution of project.
- (ii) It shall involve the completion of the proposed networking Supply, Installation and Commissioning of the required components (irrespective of declare or undeclared) and making the proposed solution available to ICAR-IASRI for carrying out live Operations and getting the acceptance of the same from ICAR-IASRI.
- (iii) The quantity of listed items may vary and will be paid as per actual.
- (iv) The bidder has to provide the onsite Comprehensive warranty and support for Three (3) Years of supplied items and services from the date of acceptance.
- (v) The existing infrastructure of local Area Network including Wi-Fi should be intact and integrated. The Bidder shall ensure Integration and interoperability with the existing

network. The bidder will try & reuse the items and relocate of existing Wi- Fi Access Points available to the extent possible subject to its functionality & feasibility.

- (vi) The bidder will carry out the feasibility sites surveys, prepare the drawings, laying & cable route plans, rack locations, node placement, Wi-Fi access points placement, etc. for the Wi-Fi enabled Campus Network infrastructure in consultation with the Purchaser.
- (vii) The Bidder has to provide architecture design of proposed solution in soft copy as well as hard copy.
- (viii) All the Conduit, channel, G.I. Pipe, cables, connector etc. has to be provided from by the vender. No additional items will be provided by IASRI.
- (ix) Proper identification and labelling of networking components, cables, SMB/IO etc. so that easy to find the required component.
- (x) The bidder will design, supply, install, commission, integrate and does maintenance of Wi-Fi enabled Campus Network & other IT Infrastructure as per requirement inconformity with Schedule of Requirement (any subset of items & quantities), Technical Specifications and terms & conditions of the tender.
- (xi) The bidder shall deliver and implement the technologies in conjunction with a set of best practices guidelines & industry standards.
- (xii) The bidder will ensure smooth integration of the offered equipment with any existing equipment/network.
- (xiii) The bidder will provide user manual to end-user detailing operations of the equipment and onsite user level training at the time of installation.
- (xiv) The bidder will submit a detailed implementation plan after consultation with the purchaser within one week from the date of purchase order.
- (xv) The Bidder has to ensure that during the execution of the project, they do not damage or disrupt the existing services under and above the ground.
- (xvi) The Bidder has to comply with the security policy of the user organization and its nondisclosure agreement.
- (xvii) The methodology of conducting & cabling and installation work, to be adopted, has to ensure minimum damage to the existing finish and no loss to the aesthetic beauty of the floors & Walls. Any damage to the existing flooring/walls etc. shall be made good by the bidder.
- (xviii) The bidder shall organize technical training about the Wi-Fi Campus Network equipment after installation and commissioning have been completed. Training will be provided at

no additional cost at the place of installation. All the training material will be provided by the bidder under approval by the purchaser.

- (xix) The bidder will ensure the availability of services from a professionally qualified team during the implementation of the project and to provide the required on-site warranty & maintenance for a period of three years.
- (xx) The Bidder will be liable for up-gradation for maintenance of any hardware and software without any extra cost during the warranty period.
- (xxi) On completion of the work the bidder shall submit the detailed diagram/drawings & documentation of the project to the Purchaser.

### 3. Site Visit

It is the responsibility of the bidder to visit the proposed sites at their own cost and assessing the feasibility before submitting their technical solution and offer to get a clear idea about the work and preparation of requirement across the sites. ICAR-IASRI will facilitate bidders to get access to the sites upon prior intimation between 9:30 AM to 5:30 PM on all working days if required.

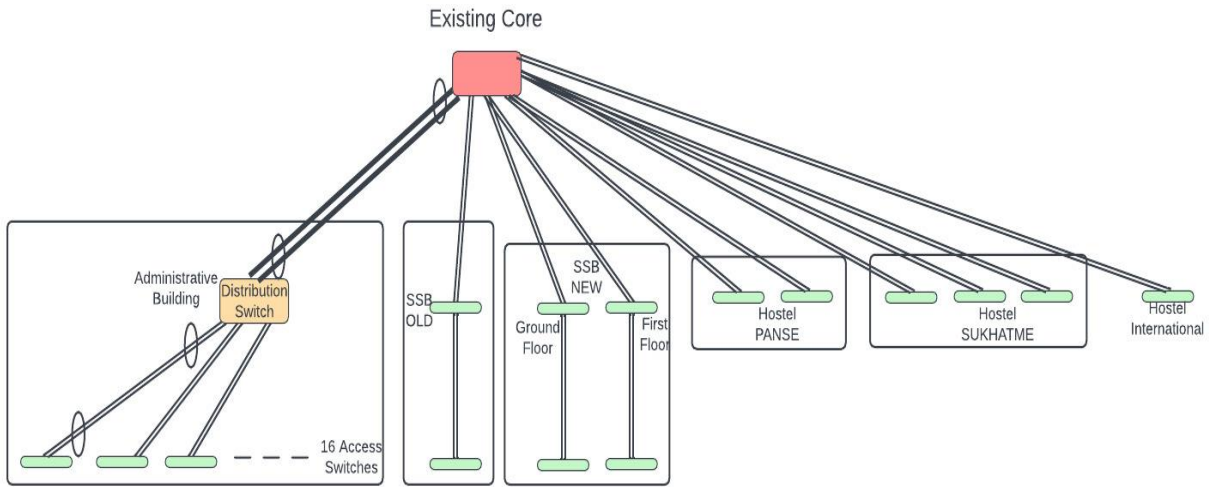
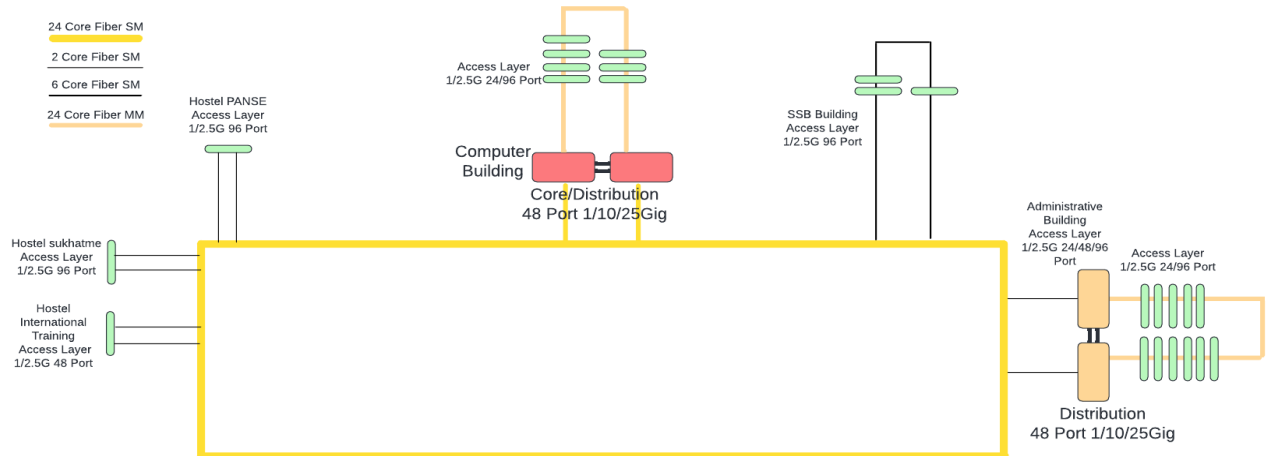
### 4. Technical Specification:

#### A. List of Items (These estimated quantities are minimum and may be vary as per actual)

S. No	Description	Unit (UOM)	Total Qty
1.	Wireless Manager/Controller	Nos.	01
2.	In Room AP	Nos.	28
3.	Indoor AP	Nos.	03
4.	High Density Indoor AP	Nos.	7
5.	12 or Higher port PoE Switch	Nos.	04
6.	48 port PoE Switch	Nos.	05
7.	96 or Higher port PoE Switch	Nos.	01
8.	10G Multi Mode SFP	Nos.	60
9.	10G Single Mode SFP	Nos.	40
10.	48 Core Single mode (9/125µm) G652 Fiber optic Cable	Nos.	5150
11.	6 Core Single mode (9/125µm) G652 Fiber optic Cable	Nos.	1440
12.	6 Core Multimode (50/125µm) Fiber optic Cable	Nos.	560
13.	48F, 1U Rack Mount Fiber Enclosure (LIU) including Splice Trays and Adapter Strips, OS2	Nos.	4
14.	24F, 1U Rack Mount Fiber Enclosure (LIU) including Splice Trays and Adapter Strips, OS2	Nos.	9
15.	24F, 1U Rack Mount Fiber Enclosure (LIU) including Splice Trays and Adapter Strips, OM4	Nos.	1

16.	12F, 1U Rack Mount Fiber Enclosure (LIU) including Splice Trays and Adapter Strips, OM4	Nos.	3
17.	Fiber Patch Cords, LC-LC Duplex, Single mode OS2 Armored, 3MT	Nos.	28
18.	Fiber Patch Cords, LC-LC Duplex, Multimode OM4 Armored, 3MT	Nos.	8
19.	96 Core Fiber Optic Splice Closure	Nos.	7
20.	CAT6A S-FTP LSZH CABLE	Nos.	29
21.	Category 6A Shielded Keystone Outlet	Mtrs.	374
22.	Cat6A Shielded LSZH Patch Cords for Rack & Workstation End	Mtrs.	374
23.	Cat6A Unshielded LSZH Patch Cords for Uplink	Mtrs.	4
24.	Cat6A Field Mount Modular RJ45 Plug	Nos.	38
25.	24 Port, 1U Category 6 / 6A Staggered Patch Panel, Unloaded	Nos.	10
26.	Face Plate, UK Style, Almond Color, Square with Shutters	Nos.	168
27.	Back Box for Face Plate, UK Style	Nos.	168
28.	42U Floor Mount Network Rack with Accessories	Nos.	1
29.	12U Wall Mount Network Rack with Accessories	Nos.	8
30.	HDPE Pipe 32 mm	mtr	5000
31.	Conduit and channel 25 mm and 32mm	mtr	5000
32.	32mm HDPE Pipe Joint Coupler	NOS	50
33.	Fiber Rout Marker	NOS	40
34.	Panduit label for patch cord	NOS	374
35.	Velcro Tie 25 MM ROLL	Pkts	10
36.	Cable Tie (Size 8inch)	Pkts	50
37.	FERULE	NOS	412
38.	01 KVA line interactive UPS	Nos	10
39.	Implementation Charges including any other items like Tie, cable connectors etc. required for operation of the solution	Lumpsum	As per requirement

**B. Indicative Connectivity Diagram and layout**



**C. Requirement of Technical Solution**

S. No.	Feature and Requirement	Compliance (Yes/ No /Remarks)
	The Proposed Wired and Wireless Infrastructure and Fabric management should:	
1.	Facilitate seamless, ubiquitous Wi-Fi experience for end users who depend on high-performance Wi-Fi	
2.	Both Wired and wireless to are managed via a single management platform	
3.	Enable Flexible Change Control workflow to carry out operation tasks like upgrades and configuration changes with the ability to peer-review and approve those changes.	
4.	Fabric management must be capable of Inbuilt config workflow for VXLAN EVPN config automation	

5.	Enable a Time-series database that allows the admin to go back in time to look at a specific sequence of events and gather intelligent insights.	
6.	Be capable of provisioning Endpoint Inventory for all connected IP endpoints, Identifying which port servers/ VM, containers etc connect to, locate them to the exact switch and port in the topology based in IP address or Mac address	
7.	Be capable of notifying about the Product security incident response team (PSIRTs)/bugs applicable to the deployed fabric platforms, configuration, and software version along with remedial actions.	
8.	Enable review and approval stages to allow peer review of changes or integration with IT operations with Role-Based access control (RBAC) to validate reviewer authorization.	
9.	Capable of capturing Traffic flows traversing the fabric and providing a time series to go back in time for historical analysis of captured traffic flow.	
10.	Enable Network-wide Rollback of configuration and images	
11.	Be capable of capturing Traffic flows traversing the fabric and provide a time series to go back in time for historical analysis of captured traffic flow.	
12.	Capable of exposing and locating invisible microbursts and finding out congestion hot spots and protecting application performance.	
13.	Fabric management to provide a comprehensive view of policy/config drift between two points in time, minimizing troubleshooting time	
14.	be enabled with automatic detection, blocking and location of the wireless threat.	
15.	be capable with API for analytics, portal configuration, third party integration	
16.	be capable of Onboarding Wireless Guest users.	
17.	capable of empowering Local IT Support team with troubleshooting assistance. It should be possible to do Root cause analysis from collected run-time metrics about the finding of wireless users and Access Points.	
18.	be capable of detecting the quality of experience by WIFI users for collaborative tools.	
19.	Be capable of providing real-time maps of the Wi-Fi spectrum over the floor plans.	
20.	Be capable of location tracking of Wi-Fi users over floor Maps	
21.	Capable of proactively highlighting Wi-Fi user's boarding issues and performance issues	
22.	Be capable of providing on-demand network assurance by emulating the client to connect to Wi-Fi and test connectivity and performance	
23.	Be capable of providing proactive packet captures upon anomaly detection for forensic analysis	
24.	Be capable of tracking the performance of predefined critical business applications.	
25.	Be capable of tunnelling user traffic from access points directly to remote switches using open standards-based protocols such as VXLAN, EoGRE.	
26.	Be able to automate the onboarding of new devices on the network by applying configuration settings without manual intervention	
27.	be capable of packet classification to enforce QoS for different classes of traffic.	
28.	Be capable of the hitless upgrade of Wireless APs and Wired Switches.	

29.	Wireless Infrastructure should be centrally managed and in the case of ICAR-IASRI planning to move the Wi-Fi Manager from Cloud to On-premises or from On-Premises to Cloud. It should be possible without any additional cost to ICAR-IASRI and no feature degradation is accepted. The Wireless Infrastructure should ensure spectral efficiency, High-density deployments.	
30.	The Wireless Infrastructure should be enabled with automatic detection, blocking and location of the wireless threat. The Wireless infrastructure must be capable of continuous spectral analysis to detect performance degradation e.g., weak signals, high error or retry rates. It should send proactive alerts to Local IT Support Team for performance issues e.g. Low Throughput Issues, Roaming failures, Interference etc. The Wireless infrastructure must be capable of API for analytics, portal configuration, and third-party integration from Day 1.	
31.	Wireless infrastructure must be capable of detecting the quality of experience by WIFI users for collaborative tools. Wireless infrastructure must be capable of packet classification to enforce QoS for different classes of traffic.	
32.	IASRI is planning to deploy switches and Wi-Fi on the latest VxLAN technology so these features should be available from Day 1. All switches should be supporting EVPN technology and any new latest technology.	
33.	All switches Access (All types), Leaf and Core switches (Existing) should be able to manage from a single dashboard for simplified operations. Multiple dashboards are not accepted as this will create management issues.	
34.	All the passive infrastructure should be capable to end connectivity on the CAT6A network and the Fiber Backbone shall be 10G adhering to the ANSI/TIA 568.2-D Standards and all the products in the channel shall be manufactured, tested and verified by ETL on a 04 Connector Channel and be tested upto 635 Mhz for the Copper infra. All the passive quoted products shall be UL Listed and RoHS complaint and shall be from one OEM. The offered passive solution shall carry an application warranty of 25 years and a certificate from the OEM to be submitted along with the Bid declaring the same.	

#### D. Technical Specification Active Component Specifications

##### a. Wireless Manager/Controller

S. no	Technical Specifications	Compliance Y/N /Remarks
1.	Solution Architecture	
a.	The System Architecture enlists the expectation from the "Total Solution", that are common to Wi-Fi services including, but not limited to, Wi-Fi Access, WIDS, WIPS, Network assurance, Location tracking and Guest management.	
b.	The proposed Wi-Fi controller(s) should be hosted in MEITY Approved cloud service providers	
c.	All Wi-Fi, WIDS, WIPS & RRM (Radio resource management), Wi-Fi client's traffic local switching and client traffic tunnelling	

	services should be functional if the link between Wireless APs and its management controller goes down. It must also be possible to onboard new clients in such a scenario.	
d.	The solution must facilitate Control and Provisioning of Wireless Access Point devices and ensure data encryption between access point devices and Management controllers across remote WAN/LAN links	
e.	The Architecture should be flexible and future investment proof i.e. Proposed AP Model with same software image should work with cloud based solution and if we want to change the architecture then should also work with on-prem solution without any extra License fee.	
2.	<b>Management Controller</b>	
a.	The WLAN Manager must provide centralized Wi-Fi, Network assurance, WIPS and client location tracking management system	
b.	The Management controller should have role based admin rights to manage the controller.	
c.	The Management controller should support open API's for integration with 3rd party configuration management, inventory management, performance management, process automation, reporting, WLAN monitoring tools etc.	
d.	The Solution should allow blocking traffic based on IP address, port, URL, hostname, application etc. and QoS (for example: bandwidth restriction for the SSID, QoS tagging of special traffic like Voice) at the edge (AP).	
e.	The solution should locate wireless devices (APs and Clients) on floor maps loaded on the Management controller. No internet based location services should be required (Google etc)	
f.	The Wi-Fi solution should support sending alerts to on-prem 3rd party SNMP servers via SNMP v1, v2c, v3	
g.	The solution should enable wireless client association logs which should record client MAC address, AP connected to, data transfer, data rate, session duration, content - domain (http, https, IP address), for at least 30 days	
h.	Time Schedules - the solution must allow configuration of time schedules when WLAN is / isn't available (For example: SSIDs can be active from 9 am to 5 pm and then automatically disabled)	
i.	The solution must allow automatic schedules for report generation and distribution of reports to Specific users via email	
j.	The Solution shall support RRM features like Auto transmit power control, Client load balancing, Band steering (Bi-direction between 2.4 and 5.0 Ghz ), Minimum association RSSI, Sticky client remediation.	
3.	<b>Management and Monitoring</b>	



a.	The solution should have all locations consolidated dashboard and location-specific dashboard as well.	
b.	The WLAN management plane should have visual hierarchal location tree, where the nodes of location tree inherit settings and configuration from the global level into subsequent levels in the hierarchy.	
c.	The solution should support DHCP fingerprinting to allow or deny a client from associating with an access point (AP), restrict clients in a specific VLAN, bandwidth control, apply firewall rules and apply other network policies.	
d.	The controller should enable application visibility and control. It should display list of applications with their data usage for a specific SSID as well as per client.	
e.	The system should support remote packet captures on AP radio and Ethernet ports without disrupting the client connectivity of any of the APs.	
f.	The solution should support RF spectrum analysis on 2.4GHz, 5GHz and 6Ghz band to showcase RF interference, spectrum density and duty cycle of other RF signals.	
4.	<b>Network Assurance</b>	
a.	The solution should support automated root cause analysis to highlight probable network causes for client impacting wireless issues, WiFi issues such as low RSSI, low data rate, Authentication related issue on per client basis.	
b.	The solution should highlight the reason of client connection failures related to association, authentication and network onboarding of users and specify the exact reason of failure such as association limit, capability mismatch, Radius authentication failure, EAPOL failure, fast roaming failure, Radius server not responding, webauth failure, DHCP, DNS , WPA2 4 way handshake, incorrect PSK entered by user etc	
c.	The Solution must support Synthetic client testing by connecting active sensors/APs to neighbouring APs and simulate real-world client experience by running client connectivity test for PSK and 802.1x SSIDs , application reachability and voice calls quality testing. Simulation testing should not disrupt existing user connection. In case separate HW/Sensors are required, they should be accounted as 1 sensor : 4 APs against the indoor AP deployments.	
d.	The solution shall support monitoring the performance of custom web-based enterprise applications which are TCP based.	
e.	The solution should provide recommendations of possible actions that can be taken for remediations of client's performance impacting issues.	

f.	The solution should be able to baseline important metrics related to client connectivity and performance such as Retry rate, data rate, latency and client authentication to define normal for each network/ site and highlight anomalous events that deviate from the regular baseline.	
g.	The controller should provide automatic packet capture upon detecting anomaly in client connectivity or onboarding issues for forensic analysis	
h.	The system should provide an inbuilt protocol analyser tool to read the captured wireless packets.	
5.	<b>Software &amp; System Management</b>	
a.	The system should support manual and scheduled automatic system backup.	
b.	The controller and AP can be on different software versions.	
c.	The controller should be able to upgrade and rollback all APs/group of APs to previous version.	
d.	The Controller and AP Upgrade should be hitless i.e. the upgrades should not disrupt Wi-Fi and WIPS services.	
e.	For management and monitoring operations, the controller must provide a web interface, command-line interface, and APIs.	
6.	<b>WIPS</b>	
a.	The solution must auto-classify APs precisely in different categories as managed / authorized (ie. managed device connected to the networks), external (i.e. un-managed APs not connected to the networks, e.g. neighbors), and rogue APs (un-managed AP connected to the networks)	
b.	The solution must have the capability of auto classifying Wi-Fi clients as authorized (managed clients connecting to the network), guest, rogue (un-managed client attempting connection to the network) or external (unmanaged not connecting to the network eg. neighbor), in addition to manual classification	
c.	The solution must be able to detect and automatically prevent all types of Rogue (unauthorized APs connected to the network) APs, such as: a) APs such as Bridge and NAT b) MAC-adjacent Open/Encrypted Wi-Fi routers c) Non-MAC-adjacent OPEN Wi-Fi routers d) Non-MAC adjacent APs having MAC ACLs	
d.	The solution must be able to detect and automatically prevent all Wi-Fi enabled devices such as smartphones bridging / ICS when connected to the network	
e.	The solution must detect mis-configured authorized APs and automatically prevent them.	

f.	The solution should detect and prevent outside client trying to connect to the Authorized WLAN	
g.	The solution must detect Honey Pot attacks including its advanced variants such as Multiport attack. It should be able to prevent the authorized client from connecting to a honeypot AP.	
h.	The WIPS solution should NOT affect the operation of an external (i.e. neighbors) or a man-aged access point while preventing a rogue AP on the same channel.	
i.	The solution must be able to detect wireless Denial of Service (DoS) attacks	
j.	AP should support detection and prevention of 11ax clients in case of WIPS policy violation.	
k.	The solution must provide location tracking of all types of attackers prevented / detected by WIPS	
7.	<b>Guest Management</b>	
a.	The solution should enable guest user authentication through username/password, voucher management, social media plugins, web form , OTP based authentication and self-registration.	
b.	The solution should support integration with SMTP server to send Wi-Fi access details via e-mail to guest users.	
c.	The solution should provide location-aware guest analytics, usage, social analytics information through different graphs of guest users.	
d.	The solution should be able to maintain profiles of the users connected to the guest Wi-Fi network; profiles should provide information such as login location, first name, last name, mobile number, last authentication time, email etc.	
8.	<b>License, Warranty and Support</b>	
a.	The Total solution should come with all required feature licenses from first day of installation	
b.	The Total solution should have 3 years hardware/Software/Licences warranty for AP's, controller, Adapters and every item supplied as a part of solution	
c.	The Total solution should have technical support for Hardware, Software, Software upgrades, all license cost from the OEM for 3 years.	
d.	The Total solution should come with the latest and updated version available at no extra cost	
e.	Any new release of firmware and software must be updated regularly within 3 years warranty term.	
f.	Should Provide TAC support direct from OEM not from outsourced TAC	
g.	WLAN cloud based service should be certified for SSAE SOC 2 Type II compliance	

**b. In-room AP**

<b>S. no.</b>	<b>Specification</b>	<b>Compliance (Y/N/ Remarks)</b>
1.	AP should support IEEE Wi-Fi 802.11ax/ac/a/n/b/g, IEEE 802.11d, 802.11i, 802.11 r,k,v	
2.	The AP must support the following authentication methods: WPA/WPA2-AES, PSK, WPA3 , WPA3 Transition Mode, OWE, OWE transition Mode and 802.1x/EAP authentication and AES encryption, unauthenticated (open) mode, Radius CoA.	
3.	The AP must support WPA3 Enterprise 192-bit encryption	
4.	Wi-Fi APs and the system should have ability to set SSIDs as bridge with 802.1Q VLANs or NAT.	
5.	Supply should include wall mountable units equal to the no. of APs quoted.	
6.	APs shall be compliant with all applicable national regulations. WPC certificate is required before deployment	
7.	AP must support SSH for local or remote access to device through CLI.	
8.	The SSID profiles/configurations of 2.4GHz, 5GHz and 6Ghz radios should be independent.	
9.	The device should be remotely upgradeable from the controller, so that new features / upgrades can be added.	
10.	All Wi-Fi, WIDS, WIPS, Fast roaming & RRM (Radio resource management) services should be functional if the link between AP and its management controller goes down. It must also be possible to onboard new clients in such a scenario.	
11.	AP should support IPSec tunneling feature which should be Hardware accelerated to provide optimal performance.	
12.	AP should be able to tunnel traffic to remote location without the need of controller using protocols like VxLAN/EoGRE/L2TP	
13.	The AP must be capable of receiving IP address via DHCP for IPv4/IPv6 and SLAAC for IPv6.	
14.	AP Should support uplink Ethernet Ports with at least 1x2.5 Gbps	
15.	AP Should be able to wired extension using 3 Ethernet Ports with at least 1 Gbps throughput capability	
16.	AP should be able to provide a passthrough port for convenient access of ethernet port	
17.	AP should be able to act as 802.3af PSE on one of the wired extension ethernet ports	

18.	AP must support minimum 2x2:2 antenna configuration in 5GHz, 2x2:2 antenna configuration in 6GHz, 2x2:2 configuration in 2.4GHz band and Integrated BLE radio.	
19.	AP must support for UL & DL OFDMA, DL MU-MIMO, BSS colouring , STBC and at least individual TWT	
20.	AP shall support minimum 0.5 Gbps on 2.4 GHz radio, 1.2 Gbps on 5GHz and 2.4 Gbps on 6 Ghz radio.	
21.	AP shall support 20/40/80/160 MHz channel width in 5GHz/6 Ghz band and 20/40 MHz channel width in 2.4GHz band.	
22.	Must support minimum transmit power of 24dbm and Antenna gain should be minimum 3.5 dBi for 2.4 GHz, 5 GHz and 6Ghz bands.	
23.	Rx sensitivity of AP shall -95dbm	
24.	AP must able to handle RF interference from other Wi-Fi and non-Wi-Fi sources and automatically assign channel and power so as to deliver high performance and reliable communication.	
25.	AP must support cellular interference mitigation (3G/4G picocells, femtocells, microcells).	
26.	The AP shall Support Integrated WIPS background wireless scanning and Rogue AP prevention.	
27.	The AP shall support third party analytics integration for real-time data transfer.	
28.	The AP shall support integrated firewall, traffic shaping, QoS and BYOD controls per SSID.	
29.	The Access points should support management via Openconfig directly	
30.	The AP shall support wired VLAN monitoring for extended rogue AP detection.	
31.	AP shall support self-healing wireless mesh networking.	

**c. Indoor AP**

S. no.	Specification and features	Compliance (Y/N/Remarks)
1.	AP should support IEEE Wi-Fi 802.11ax/ac/a/n/b/g, IEEE 802.11d, 802.11i, 802.11 r,k,v	
2.	The AP must support the following authentication methods: WPA/WPA2-AES, PSK, WPA3 , WPA3 Transition Mode, OWE, OWE transition Mode and 802.1x/EAP authentication and AES encryption, unauthenticated (open) mode, Radius CoA.	
3.	The AP must support WPA3 Enterprise 192-bit encryption	

4.	Wi-Fi APs and the system should have ability to set SSIDs as bridge with 802.1Q VLANs or NAT.	
5.	Supply should include ceiling/wall mountable units equal to the no. of APs quoted.	
6.	AP should support client emulation for on-demand or scheduled remote testing without disturbing the connected clients.	
7.	APs shall be compliant with all applicable national regulations. WPC certificate is required before deployment	
8.	AP must support SSH for local or remote access to device through CLI.	
9.	The SSID profiles/configurations of 2.4GHz and 5GHz radios should be independent.	
10.	The device must be capable of providing Wi-Fi access with 24/7 wireless intrusion prevention (WIPS) in a single device both operating simultaneously.	
11.	All Wi-Fi, WIDS, WIPS & RRM (Radio resource management) services should be functional if the link between AP and its management controller goes down. It must also be possible to onboard new clients in such a scenario.	
12.	AP should support IPSec tunnelling feature which should be Hardware accelerated to provide optimal performance.	
13.	AP should be able to tunnel traffic to remote location without the need of controller using protocols like VxLAN/EoGRE/L2TP	
14.	The AP must be capable of receiving IP address via DHCP for IPv4/IPv6 and SLAAC for IPv6.	
15.	AP Should support 2 Ethernet Ports with at least 1 port supporting mGig ethernet.	
16.	AP must support link aggregation (LACP) between the Ethernet ports.	
17.	AP must support Integrated BLE radio and Tri-radio (3 or more radios) configuration with 2 radios for Wi-Fi Access (2.4GHz and 5Ghz radio)and 3rd Dual band radio for scanning, WIPS, RRM without impairing the user experience.	
18.	AP must support minimum 4x4:4 antenna configuration in 5GHz and 2x2:2 configuration in 2.4GHz band.	
19.	AP must support for UL & DL OFDMA, DL MU-MIMO, BSS colouring , STBC and at least individual TWT	
20.	AP shall support minimum 0.6 Gbps on 2.4 GHz radio and 2.4 Gbps on 5GHz radio.	
21.	AP shall support 20/40/80/160 MHz channel width in 5GHz band.	
22.	AP shall support 20/40 MHz channel width in 2.4GHz band.	
23.	Must support 802.11 dynamic frequency selection (DFS).	

24.	Must support minimum transmit power of 26dbm and Antenna gain should be minimum 3 dBi for 2.4 GHz and 5 GHz bands.	
25.	Rx sensitivity of AP shall -98dbm	
26.	AP must able to handle RF interference from other Wi-Fi and non-Wi-Fi sources and automatically assign channel and power so as to deliver high performance and reliable communication.	
27.	AP must support cellular interference mitigation (3G/4G picocells, femtocells, microcells).	
28.	The AP shall Support Integrated WIPS background wireless scanning and Rogue AP prevention.	
29.	The AP shall support third party analytics integration for real-time data transfer.	
30.	The AP shall support integrated firewall, traffic shaping, QoS and BYOD controls per SSID.	
31.	The Access points should support management via Openconfig directly	
32.	The AP shall support wired VLAN monitoring for extended rogue AP detection.	
33.	AP shall support self-healing wireless mesh networking.	

**d. High Density Indoor AP**

<b>S. No.</b>	<b>Specification</b>	<b>Compliance (Y/N/Remarks)</b>
1.	AP should support IEEE Wi-Fi 802.11ax/ac/a/n/b/g, IEEE 802.11d, 802.11i, 802.11 r,k,v	
2.	The AP must support the following authentication methods: WPA/WPA2-AES, PSK, WPA3 , WPA3 Transition Mode, OWE, OWE transition Mode and 802.1x/EAP authentication and AES encryption, unauthenticated (open) mode, Radius CoA.	
3.	The AP must support WPA3 Enterprise 192-bit encryption	
4.	Wi-Fi APs and the system should have ability to set SSIDs as bridge with 802.1Q VLANs or NAT.	
5.	Supply should include ceiling/wall mountable units equal to the no. of APs quoted.	
6.	AP should support client emulation for on-demand or scheduled remote testing without disturbing the connected clients.	
7.	APs shall be compliant with all applicable national regulations. WPC certificate is required before deployment	
8.	AP must support SSH for local or remote access to device through CLI.	

9.	The SSID profiles/configurations of 2.4GHz and 5GHz radios should be independent.	
10.	The device must be capable of providing Wi-Fi access with 24/7 wireless intrusion prevention (WIPS) in a single device both operating simultaneously.	
11.	All Wi-Fi, WIDS, WIPS & RRM (Radio resource management) services should be functional if the link between AP and its management controller goes down. It must also be possible to onboard new clients in such a scenario.	
12.	AP should support IPSec tunnelling feature which should be Hardware accelerated to provide optimal performance.	
13.	AP should be able to tunnel traffic to remote location without the need of controller using protocols like VxLAN/EoGRE/L2TP	
14.	The AP must be capable of receiving IP address via DHCP for IPv4/IPv6 and SLAAC for IPv6.	
15.	AP Should support 2 Ethernet Ports with both ports supporting mGig ethernet.	
16.	AP must support link aggregation (LACP) between the Ethernet ports.	
17.	AP must support Tri-radio (3 or more radios) configuration with 2 radios for Wi-Fi Access (2.4GHz and 5Ghz radio)and 3rd Dual band radio for scanning, WIPS, and RRM without impairing the user experience.	
18.	AP must support minimum 8X8 antenna configuration in 5GHz and 4X4 configuration in 2.4GHz band.	
19.	AP must support 12 spatial streams.	
20.	AP must support for UL & DL OFDMA, DL MU-MIMO, BSS colouring , STBC and at least individual TWT	
21.	AP must support simultaneous 802.11ax operation on both 2.4GHz and 5GHz radios.	
22.	AP shall support minimum 1 Gbps on 2.4 GHz radio and 4.8 Gbps on 5GHz radio.	
23.	AP shall support 20,40,80, 80+80 & 160 MHz channel width in 5GHz band.	
24.	AP shall support 20/40 MHz channel width in 2.4GHz band.	
25.	Must support 802.11 dynamic frequency selection (DFS).	
26.	Must support minimum transmit power of 23dbm	
27.	Antenna gain should be minimum 4.5 dBi for 2.4 GHz and 5 GHz bands.	
28.	Rx sensitivity of AP shall -98dbm	



29.	AP must able to handle RF interference from other Wi-Fi and non-Wi-Fi sources and automatically assign channel and power so as to deliver high performance and reliable communication.	
30.	AP must support cellular interference mitigation (3G/4G picocells, femtocells, microcells).	
31.	The AP shall support third party analytics integration for real-time data transfer.	
32.	The AP shall support integrated firewall, traffic shaping, QoS and BYOD controls per SSID.	
33.	Must support POE+ i.e. 802at from a single ethernet port to power up the AP with 20dbm of Tx power on both radio, full spatial streams support and tri-radio operations	
34.	AP should have Integrated BLE radio.	
35.	The Access points should support management via Openconfig	
36.	The AP shall support third party analytics integration for real-time data transfer.	
37.	The AP shall support wired VLAN monitoring for extended rogue AP detection.	
38.	The AP shall support integrated firewall, traffic shaping, QoS and BYOD controls per SSID.	
39.	AP shall support self-healing wireless mesh networking.	

**e. Minimum 12 Port PoE Switch**

<b>S. No.</b>	<b>Specification</b>	<b>Compliance (Y/N) Remarks</b>
<b>1.</b>	<b>Hardware Features</b>	
<b>a.</b>	Device should have minimum 12* 1G Ethernet with 802.3af/at PoE or higher port and 2*1/10G or better Uplink Ports	
<b>b.</b>	Device should have total Throughput of 64Gbps.	
<b>c.</b>	Device should support up to 32K MAC address and 8K IPv4 simultaneously	
<b>2.</b>	<b>L3 Feature</b>	
<b>a.</b>	Device should support Routing Protocols: OSPFv2 , OSPFv3, BGP, IS-IS, and IPv6, IGMP v2/v3 and BFD	
<b>b.</b>	Device Should support Policy Based Routing (PBR) , VRRP , ECMP, Unicast Reverse path forwarding (urpf)	
<b>c.</b>	Switch should support VxLAN - EVPN	

<b>3.</b>	<b>High Availability</b>	
a.	Switch should Provide constant PoE power even when switch is under maintenance or reload.	
b.	Security Features	
c.	Device should support IEEE 802.1x Authentication framework	
<b>4.</b>	<b>Management</b>	
a.	Device Should support Zero touch provisioning .	
b.	Should support real time state streaming/ telemetry for advance monitoring from day 1 for all Access Switches.	
c.	Device should support real time data collection with sflow/netflow .	
<b>5.</b>	<b>Automation &amp; Visibility</b>	
a.	Device should support multiple simultaneous mirroring sessions across all ports and tunnelling of mirror packets to remote server	
b.	Visibility & Automation: All Access switches and SFP's should be from same OEM and should be provided along with software for unified monitoring, provisioning and telemetry solution. Should support telemetry with time-series database view, traffic flow analytics, PSIRT/BUG visibility, configuration compliance, endpoint tracking, POAP/ZTP, device resource utilization, auto topology view, alerts. ICAR-IASRI will provide required VM's to install the software in HA cluster, if any OEM wants to supply their Appliance they allowed to in HA Cluster.	
<b>6.</b>	<b>QOS</b>	
a.	Should support 8 queues per port and priority queue	
b.	Should support ACL based DSCP marking	
c.	Others term and conditions	
d.	The device should be EAL 3/NDPP/NDcPP/Make in India.	
e.	Hardware and TAC support should be directly from the OEM. OEM should have 24x7 TAC supported in India	
f.	All licences should be provided with the devices for the mentioned features. The licences should be perpetual in nature or should be provided for 7years on day-1 in case of subscription based licensing. Hardware warranty 36 months.	
g.	Manufacturer Authorization Form (MAF) is required for this bid	
h.	Warranty: 03 years (OEM to support for the same & declaration required on the letter head)	

**f. 48 Port PoE Switch**

S. No.	Specification	Compliance (Y/N /Remarks)
<b>1.</b>	<b>Hardware Features</b>	
a.	Device should have 48* 1G Ethernet Ports and 4*1/10/25G or better Uplink Ports in 1 RU fixed Form Factor.	
b.	Device should have total Throughput of 396 Gbps.	
c.	Device should support up to 60K MAC address and 60K IPv4 simultaneously	
d.	The switch should support minimum of 30W (802.11at) on all 48 ports simultaneously	
<b>2.</b>	<b>L2 features</b>	
a.	Device should support 4096 VLANs, 9216 Jumbo frame	
b.	Device should support MST, per-vlan, RSTP, BPDU Guard, Loop Guard	
<b>3.</b>	<b>L3 features</b>	
a.	Device should support Routing Protocols: OSPFv2 with multiple instances, OSPFv3, BGP, MP-BGP, IS-IS, and RIPv2	
b.	Device Should support Graceful restart for BGP, OSPF v2 and v3	
c.	Device Should support BFD inclusive of BFD for Lag links, BFD for V4 and V6 VRF, Multi-hop BFD and BFD on IP unnumbered interfaces.	
d.	Device Should support Policy Based Routing (PBR) for IPv4 and IPv6, VRRP V4 and V6, Resilient ECMP, Unicast Reverse path forwarding (urpf), and Inter-VRF route leaking	
e.	Device should support VXLAN+EVPN overlay technology.	
f.	Device should support Dynamic NAT profiles and Multicast NAT	
<b>4.</b>	<b>High availability</b>	
a.	Device should support Hitless upgrade & reloads in MLAG/Vpc setup and standalone (non-stack) setup.	
b.	Switch should Provide constant PoE power even when switch is under maintenance or reload.	
c.	Device should have N+1 redundant field-replaceable Fans with support for both front-to-rear and rear-to-front airflow options	
d.	Device should have 1 + 1 field replaceable power supply	
<b>5.</b>	<b>Security Features</b>	

a.	Device should support priority between 802.1x and Mac based authentication	
6.	<b>Management</b>	
a.	Device Should support secure Zero touch provisioning with options to provision Certificates artefacts on the device when it boots.	
b.	should support tracking changes in MAC table, ARP, IPv6 neighbour table and IPv4, v6 route table for troubleshooting purpose.	
c.	Device should support real time data collection with sflow/netflow and IPFIX support.	
7.	<b>Automation &amp; Visibility</b>	
a.	Visibility & Automation: All Access switches and SFP's should be from same OEM and should be provided along with software for unified monitoring, provisioning and telemetry solution. Should support telemetry with time-series database view, traffic flow analytics, PSIRT/BUG visibility, configuration compliance, endpoint tracking, POAP/ZTP, device resource utilization, auto topology view, alerts. IASRI will provide required VM's to install the software in HA cluster, if any OEM wants to supply their Appliance they allowed to in HA Cluster.	
8.	<b>QOS</b>	
a.	should support 8 queues per port and priority queue	
b.	should support ACL based classification for QoS	
c.	Should support PFC (Per-Priority Flow Control ) and Explicit Congestion Notification (ECN)	
9.	<b>Others</b>	
a.	should be certified for NDcPP common criteria	
b.	should have IPv6 Phase 2 logo certification	
c.	Hardware replacement warranty and TAC support should be directly from the OEM. The OEM email-id and India Contact support no. to be provided. All licences should be provided with the devices for the mentioned features from Day 1. The licences should be perpetual in nature or should be provided for 7years from day-1 in case of subscription based licensing. Hardware Support 36 months.	
d.	Transceivers should be from Same OEM as of Device.	

**g. Minimum 96 Port PoE Switch**

S. No.	Specification	Compliance (Y/N /Remarks)
--------	---------------	---------------------------

<b>1.</b>	<b>Hardware Features</b>	
<b>a.</b>	Device should have minimum 96* 2.5G or higher and 4*1/10/25G and 2* 40/100G or better Uplink Ports	
<b>b.</b>	Device should have total Throughput of 1160 Gbps.	
<b>c.</b>	Device should support upto 60K MAC address and 60K IPv4 simultaneously	
<b>d.</b>	Device should support Unified Forwarding Table (UFT) feature to flexibility allocate forwarding table resources to address different type of use cases.	
<b>e.</b>	The switch should support minimum of 60W (802.11at) on all 96 ports simultaneously	
<b>2.</b>	<b>L2 features</b>	
<b>a.</b>	Device should support 4096 VLANs, 9216 Jumbo frame	
<b>b.</b>	Device should support MST, per-vlan, RSTP, BPDU Guard, Loop Guard	
<b>c.</b>	Device support LLDP, LLDP-MED and LACP to bundle links and detect mis cabling issues.	
<b>3.</b>	<b>L3 features</b>	
<b>a.</b>	Device should support Routing Protocols: OSPFv2 with multiple instances, OSPFv3, BGP, MP-BGP, IS-IS, and RIPv2	
<b>b.</b>	Device Should support Graceful restart for BGP, OSPF v2 and v3	
<b>c.</b>	Device Should support BFD inclusive of BFD for Lag links, BFD for V4 and V6 VRF, Multi-hop BFD and BFD on IP unnumbered interfaces.	
<b>d.</b>	Device Should support Policy Based Routing (PBR) for IPv4 and IPv6, VRRP V4 and V6, Resilient ECMP, Unicast Reverse path forwarding (urpf), and Inter-VRF route leaking	
<b>e.</b>	Device Should support Accumulated IGP Metric (AIGP), BGP Monitoring Protocol (BMP) and BGP Prefix Origin Validation with Resource Public Key Infrastructure (RPKI)	
<b>f.</b>	Should support GRE tunnel interface and GRE IP Decap	
<b>g.</b>	Device should support VXLAN+EVPN overlay technology.	
<b>h.</b>	Device should have support for symmetric and asymmetric IRB with EVPN with distributed gateway functionality.	
<b>i.</b>	Device should support IPv4 and IPv6 clients in EVPN based overlay network and should support active-active EVPN multi-homing	
<b>j.</b>	Device should support Dynamic NAT profiles and Multicast NAT	

k.	Device should support IGMP v2/v3,PIM-SM / PIM-SSM, Anycast RP (RFC 4610), VRF Support for IP Multicast, Multicast Source Discovery Protocol (MSDP)and IP Multicast Multipath.	
4.	<b>High availability</b>	
a.	Device should support Hitless upgrade & reloads in MLAG/Vpc setup.	
b.	Switch should Provide constant PoE power even when switch is under maintenance or reload.	
c.	Device should have N+1 redundant field-replaceable Fans with support for both front-to-rear and rear-to-front airflow options	
d.	Device should have 1 + 1 field replaceable power supply	
e.	Device should support Low-Memory mode wherein during a out of memory condition the device kills non-essential agents until the system recovers the necessary amount of memory.	
5.	<b>Security Features</b>	
a.	Device should support priority between 802.1x and Mac based authentication	
6.	<b>Management</b>	
a.	should support tracking changes in MAC table, ARP, IPv6 neighbour table and IPv4, v6 route table for troubleshooting purpose.	
b.	should support real time state streaming/ telemetry for advance monitoring from day 1	
c.	should support NTP and IEEE 1588 PTP (Transparent Clock and Boundary Clock)	
d.	Device should support real time data collection with sflow/netflow and IPFIX support.	
7.	<b>Automation &amp; Visibility</b>	
a.	Should support measure the two-way metrics such as delay, jitter, packet loss rate between two network elements using Two-Way Active Measurement Protocol (TWAMP) as per RFC 5357	
b.	Visibility & Automation: All Access switches and SFP's should be from same OEM and should be provided along with software for unified monitoring, provisioning and telemetry solution. Should support telemetry with time-series database view, traffic flow analytics, PSIRT/BUG visibility, configuration compliance, endpoint tracking, POAP/ZTP, device resource utilization, auto topology view, alerts. IASRI will provide required VM's to install the software in HA cluster, if any OEM wants to supply their Appliance they allowed to in HA Cluster.	
8.	<b>QOS</b>	

a.	should support 8 queues per port and priority queue	
b.	Should support PFC (Per-Priority Flow Control ) and Explicit Congestion Notification (ECN)	
9.	<b>Others</b>	
a.	should be certified for NDcPP common criteria	
b.	should have IPv6 Phase 2 logo certification	
c.	Hardware replacement warranty and TAC support should be directly from the OEM. The OEM email-id and India Contact support no. to be provided. All licences should be provided with the devices for the mentioned features from Day 1. The licences should be perpetual in nature or should be provided for 7 years from day-1 in case of subscription based licensing. Hardware Support 36 months.	
d.	Transceivers should be from Same OEM as of Device.	

#### E. Specifications Passive Component

<b>a. Passive component OEM Eligibility</b>		
<b>S. No.</b>	<b>Eligibility Criteria</b>	<b>Compliance (Yes/No)</b>
1	The OEM Passive component offered must be in India for at-least 5 years . Further, they should have Indian Technical Support Centre, Repair and RMA center in India.	
2	Passive OEM should be an ISO9001, ISO 14001 and ISO 45001 should have its Manufacturing units, Components and Finished Goods Warehouse & R&D labs in India. The OEM shall be CE Certified. All Related documents to be submitted.	
3	All Passive networking material (Fibre and UTP cables, Patch Cables, Patch Panels, Modules, Pigtaills, I/O, FTP, Face plates, Racks, etc.) should be from one OEM/make only who should only be a manufacturing Passive Structured cabling component catering to Enterprises, Datacenter (PreTerminated UTP and Fiber), FTTH and Industrial segments. If the OEM is manufacturing or dealing with multiple subcategories, then the said passive networking material should be from the single category only. The compatibility must be ensured of offered materials. Datasheet for quoted products shall be available of OEM website.	

4	All passive products should be from single OEM, manufactured as per latest TIA/EIA or ISO/ IEC standard and have 25 years of channel performance warranty and be a member of Building Industry Consulting Services International (BICSI). The OEM should have a certified project management professional (PMI-PMP) on the OEM's payroll sitting in India whose services can be utilized for this project. The valid Certificates of the OEM employees along with a letter from the OEM HR Department verifying that the employees are in fact sitting in India should be submitted. (Details must be provided).	
5	The OEM should not have been blacklisted by any Government / Government agency/ Défense / Financial Institution in India A self-declaration letter by the OEM, on the Company's letterhead, should be submitted along with the technical bid	
6	The authorized system integrator should be certified by the proposed OEM and shall be having 04 certified engineer on the same. (Documents to be enclosed)	

**b. 48 Core single mode (9/125µm) G652 Fiber optic Cable**

<b>S. No.</b>	<b>Parameter</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>
1	Make	To be Specified by the Bidder	
2	Type	48 & 24 Core Single mode (9/125µm) G652 Fiber optic Outdoor Cable	
3	Cable	48 & 24 Core Single Mode Multi loose Tube, Single Sheath, Non-Metallic Central strength member and ECCS armouring.	
4	Application	Cable is perfectly suited for both gigabit Ethernet and 10 gigabit Ethernet campus and backbone applications.	
5	Outer Sheath	UV Resistance LSZH Jacket / Black	
6	No. of Tube / Tube diameter	4 / 2.0 ± 0.1 mm	
7	Water Blocking Material	Thixotropic Gel	
8	Loose Tube Construction	Std. plywood reel: Multi loose Tube, Water Blocking with fibres. Individually colour coded optical fibres as per Global Standards	
9	Cable Specifications	Fiber Colour / Fibers per Tube : Blue, Orange, Green, Brown, Grey, White, Red, Black, Yellow, Violet, Pink, Aqua Cable diameter : 12.5 ± 0.5 mm	
10	Optical Properties	Core Non-circularity : ≤ 1 %	



		Cladding Diameter : $125.0 \pm 0.7 \mu\text{m}$	
		Core/cladding Concentricity Error : $\leq 0.6\mu\text{m}$	
		Cladding Non-circularity : $\leq 1.0 \%$	
		Primary Coating Diameter : $245\pm 10\mu\text{m}$	
		Coating/cladding Concentricity Error : $\leq 12\mu\text{m}$	
		Attenuation Co-efficient	
		1310 Wavelength (nm) : $\leq 0.36 \text{ dB/km}$	
		1550 Wavelength (nm) : $\leq 0.24 \text{ dB/km}$	
		1625 Wavelength (nm) : $\leq 0.26 \text{ dB/km}$	
		Chromatic dispersion :	
		1288 ~ 1339nm $\leq 3.5\text{ps}/(\text{nm}\cdot\text{km})$	
		1550nm $\leq 18 \text{ ps}/(\text{nm}\cdot\text{km})$	
		1625nm $\leq 22 \text{ ps}/(\text{nm}\cdot\text{km})$	
		Cutoff Wavelength $\leq 1260 \text{ nm}$	
		PMDQ (Quadrature average*) : $\leq 0.20 \text{ ps}/\text{km}^{1/2}$	
		MFD : $9.1 \pm 0.4 \mu\text{m}$ at 1310nm	
		Zero dispersion slope : $\leq 0.092\text{ps}/(\text{nm}^2\cdot\text{km})$	
		Zero dispersion wavelength : 1300~1324nm	
13	Temperature Range	Storage Temperature Range: $-40^\circ\text{C}$ to $+70^\circ\text{C}$	
		Installation Temperature Range: $-10^\circ\text{C}$ to $+70^\circ\text{C}$	
		Operating Temperature Range: $-40^\circ\text{C}$ to $+70^\circ\text{C}$	
14	Physical Properties	Complies to ANSI/TIA-568.3-D, ITU-T G652.D, Telcordia GR-20, IEC 60794-2, ISO/IEC 11801, ISO/IEC 24702	
		Cable Bend Radius : 20 x Cable Diam.	
		Cable Kink Radius : 10 x Cable Diam.	
		Cable Max. Tensile Strength (Short Term) : 4000 N	
		Cable Max. Crush Resistance (Short Term) : 4000 N / 100mm	
		Impact Resistance : 10 Nm	
15	RoHS Compliant	Compliant as per RoHS Directive 2011/65/EU and (EU) 2015/863	

<b>c. 6 Core single mode (9/125µm) G652 Fiber optic Cable</b>			
<b>S. No.</b>	<b>Parameter</b>	<b>Specification</b>	<b>Compliance (Yes/No /remarks)</b>
1	Make	To be Specified by the Bidder	
2	Type	6 Core Single mode (9/125µm) G652 Fiber optic Indoor / Outdoor Cable	
3	Cable	6 Core Single mode , PBT Multi loose tube with coloured fiber cores. The constructions are of dry water-blocking material with Non-Metallic Central Strength member.	
4	Application	This cable has LSZH outer jacket makes it perfect for indoor/outdoor applications. Cable are perfectly suited for both gigabit Ethernet and 10 gigabit Ethernet campus and backbone applications.	
5	Outer Sheath	LSZH Jacket / Black	
6	No. of Tube / Tube diameter	5 / 1.9 ± 0.2 mm	
7	Water Blocking Material	Yarn / Tape	
8	Loose Tube Construction	Std. plywood reel: Multi loose Tube, Yarn / Tape with fibres. Individually colour coded optical fibres as per Global Standards	
9	Cable Specifications	Fiber Color / Fibers per Tube : Blue, Orange, Green, Brown, Grey, White, Red, Black, Yellow, Violet, Pink, Aqua	
		Cable diameter : 9.5 ± 0.5 mm	
10	Optical Properties	Core Non-circularity : ≤ 6 %	
		Cladding Diameter : 125.0 ± 0.7 µm	
		Core/cladding Concentricity Error : ≤ 0.6µm	
		Cladding Non-circularity : ≤ 1.0 %	
		Primary Coating Diameter : 245±10µm	
		Coating/cladding Concentricity Error : ≤ 12µm	
		Attenuation Co-efficient	
		1310 Wavelength (nm) : ≤0.36 dB/km	
		1550 Wavelength (nm) : ≤0.24 dB/km	
		1625 Wavelength (nm) : ≤0.26 dB/km	
		Chromatic dispersion : 1285 ~ 1330nm ≤ 3.4ps/(nm·km)	

		1550nm $\leq$ 18 ps/(nm·km)	
		1625nm $\leq$ 22 ps/(nm·km)	
		Cutoff Wavelength $\leq$ 1260 nm	
		PMDQ (Quadrature average*) : $\leq$ 0.20 ps/km <sup>1/2</sup>	
		MFD : 9.1 $\pm$ 0.4 $\mu$ m at 1310nm	
		MFD : 10.3 $\pm$ 0.5 $\mu$ m at 1550nm	
		Zero dispersion slope : $\leq$ 0.092ps/(nm <sup>2</sup> ·km)	
		Zero dispersion wavelength : 1300~1324nm	
13	Temperature Range	Storage Temperature Range: -40°C to +70°C	
		Installation Temperature Range: -10°C to +70°C	
		Operating Temperature Range: -40°C to +70 °C	
14	Physical Properties	Complies to ANSI/TIA-568.3-D, ITU-T G652.D, Telcordia GR-20, IEC 60794-2, ISO/IEC 11801,ISO/IEC 24702	
		Cable Bend Radius : 20 x Cable Diam.	
		Cable Kink Radius : 10 x Cable Diam.	
		Cable Max. Tensile Strength (Short Term) : 1500 N	
		Cable Max. Crush Resistance (Short Term) : 2000 N / 100mm	
		Impact Resistance : 25 Nm	
16	RoHS Compliant	Compliant as per RoHS Directive 2011/65/EU and (EU) 2015/863	
<b>d. 6 Core Multimode (50/125<math>\mu</math>m) Fiber optic Cable</b>			
<b>S. No.</b>	<b>Parameter</b>	<b>Specification</b>	<b>Compliance (Yes/No /remarks)</b>
1	Make	To be Specified by the Bidder	
2	Type	6 Core Multimode (50/125 $\mu$ m) Fiber optic Indoor / Outdoor Cable	
3	Cable	12 Core Multimode , PBT Multi loose tube with coloured fiber cores. The constructions are of dry water-blocking material with Non-Metallic Central Strength member.	

4	Application	This cable has LSZH outer jacket makes it perfect for indoor/outdoor applications. Cable are perfectly suited for both gigabit Ethernet and 10 gigabit Ethernet campus and backbone applications.	
5	Outer Sheath	LSZH Jacket / Black	
6	No. of Tube / Tube diameter	5 / 1.9 ± 0.2 mm	
7	Water Blocking Material	Yarn / Tape	
8	Loose Tube Construction	Std. plywood reel: Multi loose Tube, Yarn / Tape with fibres. Individually colour coded optical fibres as per Global Standards	
9	Cable Specifications	Fiber Color / Fibers per Tube : Blue, Orange, Green, Brown, Grey, White, Red, Black, Yellow, Violet, Pink, Aqua	
		Cable diameter : 9.5 ± 0.5 mm	
10	Optical Properties	Core Non-circularity : ≤ 5 %	
		Cladding Diameter : 125.0 ± 0.7 μm	
		Core/cladding Concentricity Error : ≤ 1.0μm	
		Cladding Non-circularity : ≤ 1.0 %	
		Primary Coating Diameter : 245 ± 7 μm	
		Coating/cladding Concentricity Error : ≤ 12μm	
		Attenuation Co-efficient	
		850 Wavelength (nm) : ≤ 2.36 dB/km	
		1300 Wavelength (nm) : ≤ 0.6 dB/km	
		Effective Modal Bandwidth	
		≥ 4700MHz.km (OM4)	
		≥ 2000MHz.km (OM3)	
Attenuation inhomogeneity : ≤ 0.1dB(500)			
13	Temperature Range	Storage Temperature Range: -40°C to +70°C	
		Installation Temperature Range: -40°C to +60°C	
		Operating Temperature Range: -40°C to +70 °C	
14	Physical Properties	Complies to ANSI/TIA-568.3-D, Telcordia GR-20, IEC 60794-2, ISO/IEC 11801, ISO/IEC 24702	

		Cable Bend Radius : 20 x Cable Diam.	
		Cable Kink Radius : 10 x Cable Diam.	
		Cable Max. Tensile Strength (Short Term) : 2500 N	
		Cable Max. Crush Resistance (Short Term) : 2000 N / 100mm	
		Impact Resistance : 1 Nm	
16	RoHS Compliant	Compliant as per RoHS Directive 2011/65/EU and (EU) 2015/863	
<b>1U Rack Mount Fiber Enclosure (LIU) including Splice Trays and Adapter Strips</b>			
<b>S. No.</b>	<b>Parameter</b>	<b>Specification</b>	<b>Compliance (Yes/No /remarks)</b>
1	Make	To be Specified by the Bidder	
2	Type	1U Rack Mount Fiber Enclosure (LIU) including Splice Trays and Adapter Strips	
3	Fiber Interface Unit	Fiber Patch Panel Typically used in Server rooms, Network rooms, Data Centres and Small offices Can be mounted directly on any 19" rack or cabinet. It should be able to accommodate a variety of Fiber connectors and terminated to fiber cables using Splicing or other methods.	
4	Type	Fiber LIU should be 1U or 2U (1.75"), 19 Inch Rack Mount.	
		12/24/48 and 96 Port should be available in 1U Rack Mount LIU.	
		LC Type Connectors will be required.	
5	Features & Compatibility	Each 1U LIU should be able to accommodate at least 96 fibres in LC type connectors.	
		24 Fiber Splice trays should be included with LIU.	
		Each 1U panel should take either two or four adapter plates or 4 MPO/MTP Cassettes at allowing flexible and customized patch panel design.	
		Universal Optical fiber adapter strips shall provide the connecting interface between two optical fiber connectors.	

		Adapter Strips should be preloaded with adapters/couplers Duplex.	
		Couplers in adapter strip should be Blue Coloured	
		Adapter strips should be available for both Single-mode and Multimode.	
		Adapter strips should be available in LC/SC/ST types.	
6	Material	Panel should be available in SPCC (Cold rolled steel sheet) and Aluminium Material	
7	Standards	Complies to Single Mode (ANSI/TIA-568.3-D, Telcordia GR-326-CORE, Telcordia GR-1221-CORE, ISO/IEC 11801, IEC 61754 & IEC 61300 series), Multi-Mode (ANSI/TIA-568.3-D, IEC 61300-3-4, IEC 61300-3-6, IEC 60874-1, ISO/IEC 11801)	
8	Dimensions	483 x 250 x 44.45 mm / 483 x 250 x 88.90 mm	
9	Pigtails Type	Single mode / Multimode	
10	Type	Optical Fiber Pigtail LC - Simplex - Single mode OS2, Yellow Color / Multimode, Aqua Color - 1.5 Mtr,	
11	Feature	These are Bend insensitive fibers and suitable for internal use only.	
12	Standard	Optical Fiber Pigtail should comply with ANSI/TIA-568.3-D, ITU-T G.657.A1 (Compatible with G.652.D), IEC 61300-3-4, IEC 61300-3-6, IEC 60874-1, Telcordia GR-326 standards	
13	Jacket	LSZH jacket, meets IEC-60332-1 (LSZH) flame rating for standard safety compliant	
14	Insertion Loss	SM : $\leq 0.2$ dB / MM : $\leq 0.3$ dB	
15	Return Loss	SM : $\geq 50$ dB (UPC) / MM : $\geq 35$ dB (UPC)	
16	Repeatability	$\leq 0.1$ dB	
17	Durability	$\leq 0.2$ dB, 1000mattings	
18	Ferrule Material	Zirconia Ceramic	
19	Operating Temperature	-40 °C to +85 °C	
20	RoHS Compliant	Compliant as per RoHS Directive 2011/65/EU and (EU) 2015/863	

<b>e. Fiber Patch Cords, LC-LC Duplex, single mode OS2 Armoured, 3MT</b>			
<b>S. No.</b>	<b>Parameter</b>	<b>Specification</b>	<b>Compliance (Yes/No /remarks)</b>
1	Make	To be Specified by the Bidder	
2	Features	The rugged patch cord uses spiral steel tape inside the outer jacket as an armour to protect the fiber glass inside	
		The spiral steel tape provides additional crush resistant and rodent attack prevention. The patch cord comes in many variations in terms of fibres, cables and connectors.	
		Good mechanical and temperature characteristics.	
		Small diameter, lightweight, easy to connect and support large capacity data transmission.	
		The aramid fiber is to be deployed to enhance the tensile strength of optical cable, which is more suitable for long distance cable.	
		The protective layer of spiral steel belt is adopted, which has excellent side pressure resistance, flexibility and bending performance.	
3	Fiber Count	2	
4	Outer jacket OD	7.0 ± 0.3 mm	
5	SUS Spiral Armoured OD	4.6 ± 0.2 mm	
6	Insertion Loss	≤0.3 dB	
7	Return Loss	≥ 50 dB	
8	Durability	≤0.2 (1000 mattings)	
9	Minimum allowable Tensile strength(N)	1000 (short Term), 600(Long Term)	
10	Minimum allowable Crush Load strength(N/100mm)	3000(short Term),2000(Long Term)	
11	Minimum bending radius(mm)	20D(short Term),10D(Long Term)	
12	Operating Temperature	-10°C to + 60°C	
13	Storage Temperature	-40°C to + 70°C	
<b>f. Fiber Patch Cords, LC-LC Duplex, Multimode OM4 Armoured, 3MT</b>			

<b>S. No.</b>	<b>Parameter</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>
1	Make	To be Specified by the Bidder	
2	Features	The rugged patch cord uses spiral steel tape inside the outer jacket as an armour to protect the fiber glass inside	
		The spiral steel tape provides additional crush resistant and rodent attack prevention. The patch cord comes in many variations in terms of fibers, cables and connectors.	
		Good mechanical and temperature characteristics.	
		Small diameter, lightweight, easy to connect and support large capacity data transmission.	
		The aramid fiber is to be deployed to enhance the tensile strength of optical cable, which is more suitable for long distance cable.	
		The protective layer of spiral steel belt is adopted, which has excellent side pressure resistance, flexibility and bending performance.	
3	Fiber Count	2	
4	Outer jacket OD	7.0 ± 0.3 mm	
5	SUS Spiral Armored OD	4.6 ± 0.2 mm	
6	Insertion Loss	≤0.2dB	
7	Return Loss	≥ 35dB	
8	Durability	≤0.2 (1000 mattings)	
9	Minimum allowable Tensile strength(N)	1000 (short Term), 600(Long Term)	
10	Minimum allowable Crush Load strength(N/100mm)	3000(short Term),2000(Long Term)	
11	Minimum bending radius(mm)	20D(short Term),10D(Long Term)	
12	Operating Temperature	-10°C to + 60°C	
13	Storage Temperature	-40°C to + 70°C	
14	RoHS Compliant	Compliant as per RoHS Directive 2011/65/EU and (EU) 2015/863	



<b>g. 96 Core Fiber Optic Splice Closure</b>			
<b>S. No.</b>	<b>Parameter</b>	<b>Specification</b>	<b>Compliance (Yes/No /remarks)</b>
1	Make	To be Specified by the Bidder	
2	Type	96 Core Fiber optic mechanical splice closure	
3	Feature	Used in underground, aerial, pedestal or direct buried, hand hole-mounting and duct-mounting applications.	
		Advanced internal structure design	
		UV Stable, compact and lightweight.	
		Fully mechanical – no heat shrinks	
		Air Valve for pressure testing.	
		Easy to re-enter, it never requires re-entry kits.	
		Elastic seal fitting, easy for future capacity upgrades and re-enters.	
		Loop Storage basket	
	Insert plates and fixing bolts are used for proper mounting		
4	Type	Cylindrical	
5	Max. Splice Capacity	144F	
6	Cable Entry/Exit	5 (4 Drop & 1 Express cable)	
7	Splice Tray	24F * 6 Nos	
8	Sealing Type	Mechanical	
9	Ingress Protection	IP68 Rated	
10	Enclosure Dimension	180 X 520 mm	
11	Splice Tray Material	Aluminium + ABS	
12	Splice Tray Dimension	140 X 125 X 10 mm	
13	Body Material	ABS Plastic body	
<b>h. CAT6A S-FTP LSZH CABLE</b>			
<b>S. No.</b>	<b>Parameter</b>	<b>Specification</b>	<b>Compliance (Yes/No /remarks)</b>
1	Type	CAT6A S-FTP LSZH Cable	

2	Type	8 X 23 AWG solid bard copper, Electrolytic Grade Copper Conductors Twisted as 4 Pairs, Every pair is separately shielded – pairs in metal foil (PIMF). The twisted pairs are covered with a braided screen and LSZH Outer Jacket, Category 6A, confirming to ANSI-TIA 568.2-D for Category 6A & ISO/IEC 11801 for Class EA.	
3	Support	Supports 10/100/1000Base-T, 155Mbps ATM, IEEE 802.3an (10GBase-T) Standard requirement for Applications such as High Speed Data, Voice & Video Signals over LANs, Server Farms and Other Bandwidth Sensitive Indoor Applications.	
4	Conductors	Solid bare copper 23 AWG	
5	Pair Separator	+ Shape Spline	
6	Packing	Box of 305 meters	
7	Cable Outer Diameter	7.5 ± 0.05 mm	
8	Insulation Material	Foam Polyethylene	
9	Insulation Diameter	1.37 ± 0.05mm	
10	Pairing	2 insulated conductor twisted together	
11	Individual Pair shielding	Aluminium / PET Tape shielding	
12	Braid Shield	Tinned copper braiding	
13	Delay Skew	< 45 ns	
14	Conductor Resistance	≤ 9.38 Ω /100 m	
15	Mutual Capacitance	≤ 5.6 nF/100 m	
16	Resistance Unbalance	5% Max	
17	Capacitance Unbalance	330 pF/100 m	
18	Bend Radius	Minimum 8X cable diameter	
19	Pulling Force	11.5kg	
20	Nom. Velocity of Propagation	74%	
21	Temperature Range Operation	-10 °C to +60 °C	
22	Temperature Range Installation	0 °C to +50 °C	
23	DC Loop Resistance	19 Ω /100 m	
24	DC Resistance Unbalance (mΩ)	5%	

25	Dielectric Strength Conductor to Shield	2.5 kv Dc for 2 sec	
26	Flame Properties	Flammability Test : IEC 60332-1	
		Acid Gas Emission Test : IEC 60754	
		Smoke Density Test : IEC 61034	
27	Regulatory Compliances	Should be ETL Listed in a 04-Connector Shielded Channel Tested upto 635Mhz with MTPL Plug as well as performance testing as per IEEE 802.3bt (All Report should be submitted along with bid) and UL Listed (Relevant Document to be shared)	
28	RoHS Compliant	Should be Compliant as per RoHS Directive 2011/65/EU and (EU) 2015/863	

**i. Category 6A Shielded Keystone Outlet**

S. No.	Parameter	Specification	Compliance (Yes/No /remarks)
1	Type	Category 6A Shielded Keystone Outlet	
2	Type	Modular Jacks shall meet and exceed channel specification of ANSI/TIA 568.D-2, IEC/ISO 11801 & IEC 60603-7-41 when used as a component in a properly installed within a channel.	
		Shielded	
3	Shield Material	Zinc alloy	
4	Contact Material	Phosphor Bronze, Tin (8Pins- Gold Plating)	
5	Plastic Housing	PC UL94V2	
6	Plastic Parts type	High impact flame retardant plastic	
7	PCB Material & Thickness	FR-4,1.2mm thickness	
8	Features	Small form RJ45 foot print design	
		IDC punch down with 180-degree termination	
		Wiring diagram and conductor cap supplied and the Direction marks on the side of the Keystone Jack	
9	Termination Interface	Plug Insertion Life (RJ45 Contacts) $\geq$ 750 Cycles	
		Durability (IDC Life) 200 termination cycles	

10	Plug and Outlet Contact force	≥ 100 Grams with FCC Compliant RJ-45 plug	
11	Plug retention Force	≥ 11lbf	
12	Jack wire material and thickness	0.35mm Phosphor bronze gold over nickel plating	
13	IDC Conductor	0.5mm Phosphor bronze , Tin-plating	
14	Contact Compatibility	Accommodates 23 to 26AWG solid	
15	Termination Pattern	TIA / EIA 568 A and B	
16	Operating Temperature	-10° to +60°C	
17	Storage Temperature :	-40° to +68°C	
18	Operating Humidity :	10% to 90% PH	
19	Regulatory Compliances	Should be ETL Listed in a 04-Connector Shielded Channel Tested upto 635Mhz with MTPL Plug as well as performance testing as per IEEE 802.3bt (All Report should be submitted along with bid) and UL Listed (Relevant Document to be shared)	
20	RoHS Compliant	Should be Compliant as per RoHS Directive 2011/65/EU and (EU) 2015/863	

**j. Cat6A Shielded LSZH Patch Cords for Rack & Workstation End**

<b>S. No.</b>	<b>Parameter</b>	<b>Specification</b>	<b>Compliance (Yes/No /remarks)</b>
1	Type	CAT6A Shielded LSZH Patch Cord Cable	
2	Type	Modular Cord shall meet and exceed channel specification of ANSI/TIA 568.2-D, ISO/IEC 11801 Standard.	
3	Conductor	Flexible Stranded Bare Copper, 26 AWG	
4	Insulation	Foam Skin PE (1.05 mm +/- 0.05 mm)	
5	Insulation Thickness	0.26mm	
6	Shield Material (each pair)	Aluminium Polyester tape	
7	Shield Material (Overall Braiding)	Aluminium Magnesium Alloy wire	
8	Jacket thickness	0.6 ± 0.02mm	
9	Feature	Improved Strain Relief boot with Soft latch-cover design for easy depression	

		Backward compatible for easy integration with any network component that uses a RJ45 connection	
10	Length	1 / 2 / 3 / 5 Meter & Customized length	
11	Connectors	High Grade 50 $\mu$ gold plated RJ45 Connectors	
12	Conductor Material	Stranded Bare Copper	
13	Operating Temperature Range	-10 °C to +60°C	
14	Storage Temperature Range :	-20 °C to +70°C	
15	Installation Temperature :	0 °C to +50°C	
16	Sheath Material	LSZH	
17	Cable Diameter	6.2 $\pm$ 0.02 mm	
19	Performance	Patch Cords which will give guaranteed higher bandwidth will be preferred.	
20	Regulatory Compliances	Should be ETL Verified in a 04-Connector Channel Tested upto 635Mhz with MTPL Plug (Part Code to be mentioned in report and should be submitted along with bid) and UL Listed (Relevant Document to be shared)	
21	RoHS Compliant	Should be Compliant as per RoHS Directive 2011/65/EU and (EU) 2015/863	

**k. Cat6A Unshielded LSZH Patch Cords for Uplink**

<b>S. No.</b>	<b>Parameter</b>	<b>Specification</b>	<b>Compliance (Yes/No /remarks)</b>
1	Make	To be Specified by the Bidder	
2	Type	CAT6A Unshielded LSZH Patch Cord Cable	
3	Type	Modular Cord shall meet and exceed channel specification of ANSI/TIA 568.2-D, ISO/IEC 11801 Class E & IEC 61156-6 Standard.	
4	Conductor	Flexible Stranded Bare Copper, 26 AWG	
5	Insulation	PE (0.95 $\pm$ 0.05 mm)	
6	Insulation Thickness	0.16 mm	
7	Feature	Transparent Strain Relief easy latch-cover boot design for easy depression	

		Backward compatible for easy integration with any network component that uses a RJ45 connection	
		Auto lock the jack by inserting the lockable patch cord and to unlock you should use the key.	
		Bright Traceable LED Light for easy Visual Identification	
8	Length	2 / 3 / 5 Meter & Customized length	
9	Connectors	High Grade 50 $\mu$ gold plated RJ45 Connectors	
10	Conductor Material	Solid Bare Electrolytic Grade Copper	
11	Operating Temperature Range	-10 °C to +60°C	
	Storage Temperature Range :	-20 °C to +70°C	
	Installation Temperature :	0 °C to +50°C	
12	Sheath Material	LSZH	
13	Cable Diameter	5.99 $\pm$ 0.3mm	
14	Performance	Patch Cords which will give guaranteed higher bandwidth will be preferred.	
15	RoHS Compliant	Compliant as per RoHS Directive 2011/65/EU and (EU) 2015/863	
<b>1. Cat6A Field Mount Modular RJ45 Plug</b>			
<b>S. No.</b>	<b>Parameter</b>	<b>Specification</b>	<b>Compliance (Yes/No /remarks)</b>
1	Make	To be Specified by the Bidder	
2	Type	Category 6A Field Terminate RJ45 Plug	
3	Standards	Cat6A Field Mount Plug complies to Complies to EN 50173 & ISO/IEC 11801, IEC 60512-99-001:2012 & IEC 60512-9-3:2011, Permanent Link & Channel ANSI/TIA-568.2-D for connectivity an IP-enabled IoT devices / PoE enabled devices and support high-speed applications like 5Ghz Wi-Fi and High resolution Video cameras	

4	Termination	Developed under MPTL and designed for use on Solid cable assemblies and strand conductors of sizes from AWG 23 through AWG 26	
5	Housing Material	Zinc – alloy fully shielded	
6	Plug Contact	0.35mm phosphor bronze	
7	Contact Area	Gold over nickel plating	
8	IDC Contact	0.4mm phosphor bronze, Sn over nickel plating	
9	Features	IP20 rated Field Terminable Plug	
		360 degree shielding for better EMI/EMC	
		Qualified Screened Class 6A Component	
		Durability : 1000 mating cycles	
10	Plug Contact	RJ 45 : PCB, 50 $\mu$ Phosphor bronze gold over nickel plating contacts	
11	IDC Connector	Phosphor bronze , Sn over nickel plating contacts	
12	Power over Ethernet - Applications	PoE+ type I & II IEEE 802.3at IEC 60512-99-001 (2012-08) IEC 60512-9-3 (2011-06)	
13	Operating Temperature Range	-40 °C to +70°C	
14	Storage Temperature Range :	-40 °C to +75°C	
15	Operating Humidity :	10% to 90% PH	
16	Electrical Performance	Current Rating : 1.5 Amps (max)	
		Insulation Resistance : 500 M $\Omega$ @ 500VDC	
		DC Resistance : $\leq$ 0.1 $\Omega$	
		Insertion Loss: Max. 0.45 dB	
		NEXT: Min. 34.0 dB	
		FEXT: Min. 29.1 dB	
		RL: Min. 14.0 dB	
		PSANEXT: Min 56.5 dB	
		PSACRF: Min 53.0 dB	
		TCL: Min 14.0 dB	
		Propagation Delay : < 2.5 ns	
		Propagation Delay Skew : < 1.25 ns	

17	Regulatory Compliances	Should be ETL Listed in a 04-Connector Shielded Channel Tested upto 635Mhz with MTPL Plug as well as performance testing as per IEEE 802.3bt (All Report should be submitted along with bid) and UL Listed (Relevant Document to be shared)	
<b>m. 24 Port, 1U Category 6 / 6A Staggered Patch Panel, Unloaded</b>			
<b>S. No.</b>	<b>Parameter</b>	<b>Specification</b>	<b>Compliance (Yes/No /remarks)</b>
1	Make	To be Specified by the Bidder	
2	Type	24 Port, 1U Staggered Patch Panel, Unloaded - 1U	
3	Type	24 Port 1U Unloaded ZigZag / Staggered Patch Panel The design reduces Alien Crosstalk to support IEEE 802.3an and ANSI/TIA 568.2-D.	
		Patch panels IDC (IDC of Information Outlet) Connectivity Snap in Type should be at rear end & RJ-45 jack on front panel, 19" rack mountable.	
		Patch panels Ports should be individually replaceable & Consistent port-to-port performance and includes grounding bolt	
4	Availability	Patch Panel should be available with 24 Ports in 1U	
5	Cable management	Straight Patch Panel with Staggered Information Outlet Slot that makes patch cord routing easier and eliminate the need for Horizontal Cable Management.	
6	Compatibility	Patch Panel should be able to accept Cat6A, Cat6 and Cat5e information outlets for backward and forward compatibility	
7	Height	1U (1.75")	
8	Storage Temperature Range	-40Deg C to +70 Deg C	
9	Operating Temperature range	-10Deg C to +60 Deg C	
10	Humidity	10% - 90% RH	



11	Color and Material	Metal SPCC, Black, plastic inserts, Double layer - 1.5mm, provided with mini cable ties, cage nuts & rare cable management.	
12	Regulatory Compliances	Should be ETL Listed in a 04-Connector Shielded Channel Tested upto 635Mhz with MTPL Plug as well as performance testing as per IEEE 802.3bt (All Report should be submitted along with bid) and UL Listed (Relevant Document to be shared)	
13	RoHS Compliant	Compliant as per RoHS Directive 2011/65/EU and (EU) 2015/863	
<b>n. Face Plate, UK Style, Almond Color, Square with Shutters</b>			
<b>S. No.</b>	<b>Parameter</b>	<b>Specification</b>	<b>Compliance (Yes/No /remarks)</b>
1	Make	To be Specified by the Bidder	
2	Type	UK Style with Built-in Dust Covers / Shutters	
3	Material	Fire-retardant Plastic, ABS + PC, White color, UK Style.	
4	Acceptability	Should be able to accept Cat6A, Cat6 and Cat5e information outlets, Modules, Keystones and Adaptors to suit all installation requirements	
5	Approvals	UL 94V-0	
6	No. of plates	2 Plates/Pieces Face Plate for better aesthetic look	
7	Mounting screws	Include mounting screws and Label Holders with Plastic covers	
8	Available	Single/Dual/Quad network faceplate	
9	Dimensions	(H x W x D) 86 x 86 x 14.42 mm	
10	RoHS Compliant	Compliant as per RoHS Directive 2011/65/EU and (EU) 2015/863	
<b>S. No.</b>	<b>Parameter</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>
1	Make	To be Specified by the Bidder	
2	Type	Back Box for UK Style Faceplate	
3	Material	White High impact plastics.	
4	Entry	Adjustable cable entries	
5	Dimensions	38 x 87 x 87 mm	

6	Compatible	Back box allows for mounting a various ports of Faceplates	
7	RoHS Compliant	Compliant as per RoHS Directive 2011/65/EU and (EU) 2015/863	
<b>S. No.</b>	<b>Parameter</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>
1	Make	To be Specified by the Bidder	
2	Type	19" Velcro Reusable Ties are perfect for organising your cables and cords at home or in the office.	
3	Feature	They are soft, adjustable and easy to use.	
		Ideal for securing and sorting the cable mess behind your computer, television and stereo.	
		They can also be used to wrap around appliance cords and extension leads for a tidy storage solution.	
		A safe and reusable alternative to cable ties, tapes and wires.	
		Suitable for use on cords of all sizes and small everyday household objects.	
<b>o. 42U Floor Mount Network Rack with Accessories</b>			
<b>S. No.</b>	<b>Parameter</b>	<b>Specification</b>	<b>Compliance (Yes/No /remarks)</b>
1	Make	To be Specified by the Bidder	
2	Type	24U, 800 X 600 Closed Network Rack with Front and Back Perforated Conforms to DIN 41494 or equivalent ISO Standards	
3	Material	Manufactured out of cold rolled steel sheet and proceeded with CNC, punched, formed, welded and powder coated to meet highest industrial standard, ISO 9001-2015 and 14001-2015 standards	
4	Construction	Floor mount steel racks are in welded or CKD construction with 4 pillars of 7-fold profile.	
		Top and bottom welded, ribbed and provided with reinforced frames and supported by 6 nos. of 4-fold depth members for extra rigidity.	

		Steel racks are having ventilated top and bottom cover with cut-out for cable access with Fans and Fan tray mounting provision	
5	Doors	front single or dual doors, glass/vented/plain/63% perforated (Flat/Convex) with single or 3 point locks	
		Rear single/dual door with vented/63% perforated/plain with single or 3 point locks	
6	Side Panel	Side panels partially vented/plain and for 1000 mm. deep rack will be configured with dual side panels.	
7	Wheels	Racks with 4 nos. of heavy-duty castor wheels with 2 number with breaks and 2 Numbers without break along with adjustable legs/plinth	
8	Features	Adjustable 19" equipment mounting angles with U marking provide the better mounting flexibility, maximize the usable mounting space.	
		Adjustable 4 Nos mounting angles for mounting different depth equipment	
		02 Nos. of 19" Horizontal Cable Manager 1U, Single Sided	
		4 Nos of FAN Module	
		Vertical PDU with 15A Input and having 04 Nos of C19 and 12 Nos of C13 Socket	
		Grounding and Bonding / Vertical Earthing Kit	
9	Standard Finish	Powder coated finish with Seven Tank pre-treatment process meeting all industrial standards	
10	Equipment Mounting	DIN Standard 10mm. Square slots	
11	19" Mounting Angle	Formed steel 2mm thick fully recess able	
12	Standard Color	RAL 7037 dark grey, RAL 7035 light gray and RAL 9005 Black	
13	Static Load	750 kgs with castors, 1200 kgs with base frame/plinth	
<b>p. 12U Wall Mount Network Rack with Accessories</b>			
<b>S. No.</b>	<b>Parameter</b>	<b>Specification</b>	<b>Compliance (Yes/No /remarks)</b>

1	Make	To be Specified by the Bidder	
2	Type	12U, 600 X 600 Closed Network Rack with Front and Back Perforated Conforms to DIN 41494 or equivalent ISO Standards	
3	Material	Manufactured out of cold rolled steel sheet and proceeded with CNC, punched, formed, welded and powder coated to meet highest industrial standard, ISO 9001-2015 and 14001-2015 standards	
4	Construction	Wall mount steel racks are in welded. Powder coated finish with Seven Tank pre-treatment process.	
		Top and Bottom panels are with ventilation and cable entry	
		Provision has been made to mount exhaust fans on the top of the rack for the all models	
5	Doors	Front door Lockable toughened glass or Perforated door will be provided	
6	Side Panel	Integrated with top and bottom panel and with side panels self-locking latches	
7	Features	Adjustable 19" equipment mounting angles with U marking provide better mounting flexibility	
		02 Nos. of 19" Horizontal Cable Manager 1U, Single Sided	
		2 Nos of FAN Module	
		Horizontal PDU with 15A Input and having 6 ways 5/15Amp Indian Standard Socket	
		Grounding and Bonding Earthing Kit	
8	Standard Finish	Powder coated finish with Seven Tank pre-treatment process meeting all industrial standards	
9	Equipment Mounting	DIN Standard 10mm. Square slots	
10	19" Mounting Angle	Formed steel 2mm thick fully recess able	
11	Standard Color	RAL 7035 light gray	
12	Static Load	Up to 35 kgs (6U ~ 15U)	

**F. UPS KVA line interactive**

S. No.	Parameter	Specification	Compliance (Yes/No)
1.	Rating (in KVA)	1.0	
2.	Technology	MOSFET-PWM	

3.	Inverter Efficiency (%)	70% or better	
4.	Minimum Guaranteed Battery Backup time (Minutes) on Full Load	30	
5.	Warranty for Line Interactive UPS	3 Years	
6.	Type of battery	SMF-VRLA confirming to JISC-8702 Pt 1,2 &3	
7.	Location of Battery	Inside the Enclosure of UPS	
8.	Battery capacity (Ah)	7Ah	
9.	Minimum Guaranteed VAH provided to meet or exceed minimum guaranteed Back up time	168	
10.	Number of Batteries	2	
11.	Warranty for the battery from the date of delivery	2 Years	
12.	Rated Output (Volt) with Total Harmonic Distortion (%)	Single Phase Sinewave 230v AC 50Hz with Total Harmonic Distortion as <3%	
13.	Input (Volt)	Single Phase AC (160-280V)	
14.	Salient Features	Maximum 10 milliseconds Switching over time	
15.	Variation in AVR output in AC mode (AVR Voltage regulation)	230 Volts +/-9%	
16.	Protection	Under voltage Protection (Input Voltage <160 V),Overvoltage Protection (Input Voltage>280V),Short Circuit of UPS, Low Battery, Overload	
17.	Environmental Test Report Requirements	Damp heat Test at 45 degree	
18.	Any Other Requirements	As per Meity (Government of India) guidelines UPS shall have valid IS16242-Part 1 CRS certification	
19.	Type of lab which carried out Test of Complete Product to prove the conformity of product as per specification	Certificate of Govt. Lab /NABL/ILAC accredited for UPS Testing	

20.	Agree to provide all relevant documents Test Reports/supporting document /reports etc to the buyer at the time of bidding or on demand	Yes	
-----	---	-----	--

**ATTACHMENT**

**OFFICE OF .....**  
**.....**

**PURCHASE/SUPPLY ORDER**

To:

M/s

.....  
 .....  
 .....  
 .....

Dear Sirs,

Sub: Supply of .....  
 .....

Ref: Request for Quotation no..... dated .....

1. Your quotation no.....of .....(Date) for the supply of “Upgrading LAN network with latest wi-fi and UPS” has been accepted. You are requested to supply the following goods/equipment at the rates quoted by you and specified against each as per the specifications and terms & conditions specified hereunder:

Serial. No	Brief description of goods/ equipment and Specification as per Form2	Quantity to be supplied	Unit Rate (Rs.)	GST*	Total Price (Rs.) including all taxes and duties
40.	Wireless Manager/Controller	01			
41.	In Room AP	28			
42.	Indoor AP	03			
43.	High Density Indoor AP	7			
44.	12 or Higher port PoE Switch	04			
45.	48 port PoE Switch	05			
46.	96 or Higher port PoE Switch	01			
47.	10G Multi Mode SFP	60			
48.	10G Single Mode SFP	40			

49.	48 Core Single mode (9/125µm) G652 Fiber optic Cable	5150			
50.	6 Core Single mode (9/125µm) G652 Fiber optic Cable	1440			
51.	6 Core Multimode (50/125µm) Fiber optic Cable	560			
52.	48F, 1U Rack Mount Fiber Enclosure (LIU) including Splice Trays and Adapter Strips, OS2	4			
53.	24F, 1U Rack Mount Fiber Enclosure (LIU) including Splice Trays and Adapter Strips, OS2	9			
54.	24F, 1U Rack Mount Fiber Enclosure (LIU) including Splice Trays and Adapter Strips, OM4	1			
55.	12F, 1U Rack Mount Fiber Enclosure (LIU) including Splice Trays and Adapter Strips, OM4	3			
56.	Fiber Patch Cords, LC-LC Duplex, Single mode OS2 Armored, 3MT	28			
57.	Fiber Patch Cords, LC-LC Duplex, Multimode OM4 Armored, 3MT	8			
58.	96 Core Fiber Optic Splice Closure	7			
59.	CAT6A S-FTP LSZH CABLE	29			
60.	Category 6A Shielded Keystone Outlet	374			
61.	Cat6A Shielded LSZH Patch Cords for Rack & Workstation End	374			
62.	Cat6A Unshielded LSZH Patch Cords for Uplink	4			
63.	Cat6A Field Mount Modular RJ45 Plug	38			
64.	24 Port, 1U Category 6 / 6A Staggered Patch Panel, Unloaded	10			



65.	Face Plate, UK Style, Almond Color, Square with Shutters	168			
66.	Back Box for Face Plate, UK Style	168			
67.	42U Floor Mount Network Rack with Accessories	1			
68.	12U Wall Mount Network Rack with Accessories	8			
69.	HDPE Pipe 32 mm	5000			
70.	Conduit and channel 25 mm and 32mm	5000			
71.	32mm HDPE Pipe Joint Coupler	50			
72.	Fiber Rout Marker	40			
73.	Panduit label for patch cord	374			
74.	Velcro Tie 25 MM ROLL	10			
75.	Cable Tie (Size 8inch)	50			
76.	FERULE	412			
77.	01 KVA line interactive UPS	10			
78.	Implementation Charges including any other items like Tie, cable connectors etc. required for operation of the solution	Lumpsum			
		Total			

\*GST and similar other taxes and duties applicable on finished goods. Indicate each applicable tax separately.

2. Delivery Period: .....days from the date of issue of this supply order.
3. Place of delivery : New Delhi
4. Consignee Address: ICAR-IASRI, Library Avenue, Pusa, New Delhi-110012.
5. GST and other taxes and duties, if any will be reimbursed at actual rates paid on the date of supply or the rate/amount shown in 1. above, whichever is lower.
6. Standard Manufactures commercial Warranty/Guarantee shall be 36 months from the date of delivery and acceptance.

7. Payment shall be made on delivery or within 7 days of delivery; and acceptance of the goods/equipment.

8. Other terms and conditions are as under:

.....  
.....

**(Purchaser) Date:**

Place:

Name: .....

Designation: .....

*Modify as appropriate for individual cases*