JAMIA HAMDARD

(HAMDARD UNIVERSITY)

(REACCREDITED BY NAAC IN GRADE 'A')

HAMDARD NAGAR, NEW DELHI-62

Phone: 91-011-26059688 (12 Lines): Telefax : 26059663 Ext. 5326

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TENDER DOCUMENT

(JH/PS/TENDER/03/2016)

Sealed Tenders are invited from manufactures / authorized distributors, for supply, installation and commissioning of **Wired & Wireless Network, Video Conferencing for Smart Class Rooms at Central Library, Ground Floor, Jamia Hamdard** as per details given below.

1. Detailed specifications are given in Annexure III to Annexure XIV.
2. Bonafide and reputed manufacturers / Indian agents (on behalf of their foreign Principals) can only quote and submit RFQ at **Purchase Section, Jamia Hamdard, Hamdard Nagar, New Delhi**.
3. The Tender Document for detailed specifications may be obtained from **Purchase Section, Jamia Hamdard, Hamdard Nagar, New Delhi** on payment of Rs. 500/- through Bank Draft (non-refundable) drawn in favour of **Registrar, Jamia Hamdard**, during working days **upto 15.03.2016 between 10.00 AM to 3.00 PM**.

   The last date of the receipt of the Bids is 15.03.2016 upto 4.00 p.m.
4. **The Technical Bids will be opened on 15.03.2016 at 4.30 P.m. in the Finance Officer's Room, 1st Floor, Faculty of Science, Science Building.**
5. The Tender forms are to be submitted in two separate sealed envelopes - one envelope containing **Technical Bid (Part A)** and second envelope containing **Commercial Bid (Part B)**. Both the above sealed envelopes should be put in another duly sealed envelope and **superscribed 'TENDER FOR Wired & Wireless Network, Video Conferencing for Smart Class Rooms' with the type of bid, tender no., due date and other relevant details** and should be addressed to **The Registrar, Jamia Hamdard, Hamdard Nagar, New Delhi and dropped in Tender box available in the Purchase Section.** On the due date, only Technical Bids (Part A) will be opened. Commercial Bids (Part B) shall only be opened after acceptance of Technical Bids by the competent authority. Date and time of opening the commercial bids shall be notified on Website/Email to the successful bidders of technical bids. Commercial bids shall be opened in presence of the vendors who wish to be present.
6. **Fax Tender or Tender without EMD and Tender Fee will be summarily rejected.**
7. Jamia Hamdard reserves the right to reject any / all the tenders without assigning any reason whatsoever.

STANDARD TERMS AND CONDITIONS OF TENDER

1. The Tender should be neatly typed. The rates should be quoted in words and figures without any over writing/ erasure. Any over writing/ erasure will render the Tender of the particular item invalid. The tenderer should attest all corrections by affixing his signatures and each page of the tender should be signed by the tenderer.
2. The rates quoted should be per unit and should include charges for packing and delivery and should be as per Financial Bid format mentioned on Annexure XVI.. However, the Sales tax, wherever applicable should be shown separately at the prevailing rate. If it is decided to ask for excise duty or any other levy as extra, the same must be specifically stated. In the absence of such a stipulation, it will be presumed that the prices include all such charges and no claim for the same will be entertained. This University is not liable to pay any other charges over the above the rates quoted.
3. **Tenderers are required to submit the following documents along with the Tender application without which the tender shall be treated as invalid.**
    a) Photocopies of up-to-date Sales Tax clearance certificate and Pan Card.
    b) The Bidder should submit the MAF from the respective major OEMs. A letter of authorization from the Principal specific to the tender should be enclosed.
    c) Bidder should be ISO 9001 certified.
    d) Bidder must enclosed proof of partnership level with OEMs of Wired & Wireless.
    e) OEM for Wireless Network should be listed in latest Gartner's Leaders quadrant for both Wired and Wireless LAN Access Infrastructure.
    f) Bidder should have Turn over of 1 Crore for last one Financial Year and duly certified by CA.
    g) Photocopy of Trade License.
    h) **Earnest money of Rs 25,000.00 (Rupees. Twenty Five only)** given as above in the form of Demand Draft /Banker Cheque in favour of the Registrar, Jamia Hamdard, New Delhi; which may be forfeited if the supplier failed to supply equipments within the stipulated period.
    i) The Bidder must have executed similar ICT Work in last two years preferably in any University/Education Institution/ Govt. Organization in India of minimum value of INR 35 Lakhs.
4. Minimum warranty period for each equipment / instrument should be for **three years** with spare parts from the date of installation and the successful tenderer will be liable to repair / replace the equipment / instrument if any defect is found within the warranty period. **However, for some instruments/equipments, the warranty has been mentioned against each. In such cases, warranty mentioned against the instruments/equipments shall be applicable.**
5. Provide service for at least 3 years in writing specifying "Uptime" & response time (usually less than 2 hours)
6. Local suppliers must possess a counter guarantee of service in case of imported equipments from Parent Company(OEM).
7. **The successful tenderer will have to deposit 5% of the total value of supply as Security Money; which will be refunded after completion of the warranty period and will be adjusted in case of violation of terms and conditions laid down above.**
8. Successful Tenderer will have the responsibility for arranging training to Jamia Hamdard Computer Center for smooth handling and proper functioning of supplied equipments through specified number of training sessions.

9. **Jamia Hamdard will deduct an amount of 0.25% from all the bills for "*Jamia Hamdard Relief and Welfare Fund*".**
10. **In case of Import, the following terms and conditions will be adhered to:**
    a) Prices should be quoted both on CIF Delhi (in US Dollars or Other Foreign Currency) and on F.O.R. (in Indian Rupees) Jamia Hamdard and inclusive of all taxes **(except excise / custom duty)**.
    b) Order Acknowledgement from principal company should be given within 5 days from date of purchase order.
    c) **Payment will be made though L/C or draft for import**. In case of payment through advance draft a photocopy of draft will be initially provided after receiving of Order Acknowledgement from Principal Company and original draft will be given only after the delivery of the equipment. Incase University decides payment will be made after material delivery.
    d) All bank charges outside India will be borne by the Supplier while only the bank charges in India will be borne by Jamia Hamdard.
    e) Suppliers through their own clearing agent will clear the consignment on arrival at IGI Airport. All payment in respect of clearing & landing will be borne by supplier.
    f) Bank delivery order, CDEC & Custom duty will be provided by Jamia Hamdard only on receipt of following documents from supplier at least two days in advance.
        a. Cargo Arrival Notice
        b. Master Airway Bill (MAWB)/House Airway Bill (HAWB).
        c. Commercial Invoice along with packing list.
        d. Jamia Hamdard will make available the relevant documents after receipt of required documents from Local Supplier..
11. The University shall not be responsible if the consignment incurs any demurrage.
12. Jamia Hamdard reserves the right to accept/reject a part/whole or all tenders without assigning any reason and no inquiry in this regard, will be entertained.
13. The Jamia Hamdard reserves the right to make any changes in the Technical Specification, Bill of Quantity of this Tender.
14. Bidders are not allowed to subcontract in any manner and Consortium EOIs are not acceptable.
15. The issue of this Tender document does not imply that Jamia Hamdard is bound to select a Bidder and Jamia Hamdard reserves the right to reject all or any of the Bidders without assigning any reason whatsoever.
16. Jamia Hamdard reserves the right to cancel this Tender anytime without assigning any reason thereof.
17. The Bidder should abide by the terms and conditions specified in the Tender document. If Bidders submit conditional offers, they shall be liable for outright rejection which will be decided by Jamia Hamdard.
18. At any time before the deadline for submission of Tender, Jamia Hamdard may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Bidder, modify the Tender Document by amending, modifying and / or supplementing the same. All changes shall be posted on website www.jamiahamdard.edu and prospective Bidders are required to go through the same before submission of Tender. All such amendments shall be binding on them without any further act or deed on Jamia Hamdard part. In the event of any amendment, Jamia Hamdard reserves the right to extend the deadline for the submission of the Tender, in order to allow prospective Bidders reasonable time in which to take the amendment into account while preparing their Tender.
19. **Participating in this tender would mean that Bidder is accepting all terms and conditions of this tender document. Bidders are requested to do survey and understand the existing Network of Jamia Hamdard for Smooth Integration with proposed network. Jamia Hamdard is exempted from Customs duty and hence necessary documents can be collected, Bidder's shall consider Custom Duty Exemption in there financial bid.**

20. The compatibility of all the networking components is the essence of this tender for efficient working of the network, hence bidders shall essentially quote all active components of one make for wired, wireless network and one make for Video Conferencing Solution only and also passive components of one make only. **Any deviations in this matter will subject to disqualification.**
21. All information in the Tender/Bid shall be in English. Information in any other language should be accompanied by its translation in English. Failure to comply with this may disqualify the Bidder.
22. Validity of the quoted offer should cover the period of the completion of project. Offers without such validity shall be rejected.
23. The vendor must give a point-by-point compliance to the Technical Specifications of the quoted products as per **Annexure I to Annexure XIV** of the Tender/Bid Documents and enclose with the technical bid.
24. Any cutting and changes in the document must be initialed by the person/persons signing the Tender/Bid.
25. Each page of the Tender/Bid document should be signed & stamped by the Bidder as a token of acceptance to terms and conditions mentioned.
26. Bidders should quote for all accessories which are either part of an item or are necessary for proper functioning of that item. Thus, for accessories of individual items **Jamia Hamdard** shall not pay anything separately and if the functioning of any item is not proper or does not function at all, **Jamia Hamdard** shall have the full right to deduct complete payment of that item(s).
27. The successful Bidder shall have to sign an agreement with Jamia Hamdard to comply with all rules, regulations, Laws and Byelaws enforced by Local and State Govt. and Jamia Hamdard in whose premises the work has to be done.
28. It shall be the responsibility of the contractor to make an inventory of all the materials upon its arrival at the customer's location and notify the customer of any missing components.
29. The contractor shall be responsible for safe custody of the items handed over to him by the University any loss or wastage shall have to be made good by the contractor at his/her own cost.
30. If the contractor commits any violation of the above terms, the University shall claim such damages as it may deem fit and the decision of the Jamia Hamdard.
31. All Passive Cabling work whether it is Fiber, UTP, Patch Panels, Racks Patch Cords etc should be done neatly and with proper tagging. It should be very professional and aesthetic. Entire cabling should be structured.
32. All work shall be done in a thorough and conscientious manner according to EIA/TIA guidelines and industry standards, and shall be subject to inspection and acceptance.
33. The contractor shall be certain that all the installation work areas are secure and made safe in accordance with Health and Safety regulations.
34. All legal disputes, arising if any, would be settled under jurisdiction of Delhi court.

SPECIAL CONDITIONS OF THE TENDER/BID

1. ***The cabling work is is to be completed on priority of this tender. Therefore bidders are strictly advised to visit the site on or before 12th March 2016 and take the drawing and check the routes of the Audio Visual and IT work Setup at Ground Floor Library building, Jamia Hamdard, New Delhi. The contact person at the site shall be Mr. Bose who can be reached on +91-9312219883. The bidders shall quote as per the approximate no's given in this tender however the billing shall be done on actuals.***
2. **All Active Components as per Financial BOQ should be quoted in US Dollars Foreign Currency and all passive and Services components in Financial BOQ should be quoted in INR.** The payment will be done after successful installing, integration and commissioning.

3. All prices quoted shall be inclusive of all **taxes, freight and octroi** etc. and shall be FOR **JAMIA HAMDARD**. No separate payments shall be made whatsoever.
4. All pricing shall be guaranteed not to increase, based on an order placed within the period of the completion of project.
5. The vendor must give a point-by-point compliance to the Technical Specifications of the quoted products as per Annexure I to Annexure XIV of the Tender/Bid Documents
6. The bidder must clearly mention the **make, model & enclose relevant datasheet/brochures along with requisite certificates of the products** as per the Technical specifications as mentioned in Annexure.
7. Additional similar pieces of equipment or components may be required at a later date, contingent on additional funding being made available.
8. In the event of the goods not being in accordance with the specification or the conditions of the contract or failure by the bidder to perform services as outlined in the Tender/Bid document, **JAMIA HAMDARD** reserves the right to cancel the contract at any stage.
9. A detailed Project plan is to be provided by bidder for material delivery and execution. Material delivery has to be done in 3 weeks from the release of PO and complete installation has to be done in 4 weeks from the date of release of PO.
10. **Bidder has to quote all the active components of the same make for each category (A & B) or as per Tender Specifications. Similarly, bidder has to quote all the passive components of the same make or as per Tender Specifications. Passive most preferred OEM will be Tyco, Panduit and Systimax.**

11. **Payment Terms will be as follows:**

10.1 FOR ACTIVE COMPONENTS THROUGH IMPORT WITH DUTIES EXEMPTION
WIRED & WIRELESS COMPONENTS :

70 % On Delivery of Material at Jamia & Balance 30% on Successful Implementation.

10.2 FOR PASSIVE COMPONENTS THROUGH LOCAL PURCHASE

70 % On Delivery of Material at Jamia & Balance 30% on Successful Implementation.

10.3 FOR INSTALLATION & SERVICES COMPONENTS

a. 100 % of Total Installation & Service Components Value will be paid: On execution of Project and Sign Off.

10.4 FOR RESIDENT ENGINEER

a. 100 % of Total RESIDENT ENGINEERS YEARLY QUOTE will be divided in four quarters and payable quarterly at the end of each quarter.

The above can also be negotiated during Commercial negotiation.

DELIVERY SCHEDULE

12. The delivery and installation of all the ordered items shall be completed within 4 weeks from the date of placement of order.

WARRANTY / GUARANTEE

13. The system supplied or installed shall be guaranteed by the contractor for a minimum period of **Three Years** in regards to quality of material, workmanship, performance, efficiency, installation, etc. Defects developed in the system within guarantee period, shall be rectified by the contractor at his own expense promptly.

VARIATIONS IN QUANTITY

14. The quantity mentioned in the Tender/Bid is only indicative one. **JAMIA HAMDARD** reserves the right to increase/ decrease/ remove any/all quantities while placing the order. Switches, AP, Video Conferencing, Cables/Jack Panels, Connectors, Fiber Racks, PVC channel, Fiber patch cords, Cat 6 patch cords, UTP Cable Box's, all passive components will be on actual basis.

15. During the Site Survey, the successful Bidder may suggest additional equipment which **JAMIA HAMDARD** may have left by oversight or which the Contractor considers essential in Project Implementation, The same may be submitted with the BOM after site Inspection. However the total cost of such equipment may not exceed 23 % of the complete passive Tender/Bid value, and the price justification for the same shall be submitted by the Bidder, if the item is not a part of the Tender/Bid documents.
16. Any work not covered under this contract, but which is essentially required for the completion of job (to the satisfaction of **JAMIA HAMDARD**) shall be carried out by the Contractor as extra item with prior approval of **JAMIA HAMDARD** for which payment shall be made separately at the rates decided by **JAMIA HAMDARD.**

Scope of Work

As a part of IT infrastructure build up at New Hospital, **Jamia Hamdard** desires to set up Wired & Wi-Fi Networking**,** Video Conferencing Solution for Smart Class Rooms infrastructure along with related IT services using state of the art networking equipment, Access points, Integration with existing Cisco 5760 Controller, Integration with existing Cisco AAA, Fiber and UTP cabling system at **Jamia Hamdard, Delhi.**

The following summarizes the scope of work.

1. To Implement **Wired & Wireless (Wi-Fi) Networking, Video Conferencing for Smart Class Rooms at Central Library, Ground Floor, , JAMIA HAMDARD**.
2. To Supply, install and commission Wired & Wireless Network, Video Conferencing System and integration with existing IT Infrastructure (Wireless Controller, Switches, NMS), AP's and all active components as per specifications.
3. To supply, install and commission Intra building UTP CAT6/Fiber structured cabling Network for as per BOQ.
4. Detailed Solution in Annexure XIV to be implemented.

Registrar

The above terms & conditions are accepted.

Signature.....

Name

Designation

Company Seal .....

CHECK LIST

To ensure that your offer submitted to JAMIA HAMDARD is complete in all respects, please go through the following checklist & tick mark for the enclosures attached with your offer:

S. NO.	DESCRIPTION	ATTACHED	NOT ATTACHED
1	Details of Technical Staff		
2	General Information about Bidder		
3	Earnest Money Deposit in the prescribed form		
4	Tender/Bid document duly signed & sealed on every page, as a confirmation of acceptance of the terms & conditions of the Tender/Bid.		
5	Technical Bid in Separate Envelope - Annexure III to Annexure XIV Compliance		
6	Financial Bid in a Separate Sealed Envelope - Annexure XVI		

ANNEXURE – I

Details of Technical staff available with the company for execution of work

(Information to be attached with the Offer)

S. No.	Name	Qualification	Additional Certification, if any	Total Experience, no. of years	Remarks
1. 2. 3.					

- If necessary, separate sheet may be used to submit the information.

ANNEXURE – II

GENERAL INFORMATION ABOUT THE BIDDER

1.	**Name Of The Bidder**	
2	**Postal Address**	
3	**Telephone/Fax no**	
4	**E-mail address & URL**	
5	**Type of Company** Attach Proof of Company Registration along with a copy of the Partnership Deed/ Article of Association and Memorandum of Understanding	
6	**Name and designation of the representative** of the Bidder to whom all references shall be made to expedite technical co-ordination.	
7	**Amount and reference of the EMD**	
8	**Financial capacity of the company/ firm.** (Attach copies of I.T. Returns and Balance Sheets for last 1 Year)	
9	**Name and address of the Indian/Foreign collaborator(s) if any**.	
11	**PAN/TAN Number** (A copy should be enclosed)	

ANNEXURE – III - SLA's

1. Bidder will be responsible for onsite maintenance and operations support for 3 years from the date of material delivery.

2. During the period of SLA the Vendor shall ensure proper functioning of the Jamia Hamdard Network components and keep an **uptime** of 96% {ninety nine percent} per month .

   Uptime is defined as follows:

   Uptime (in %) = Total no. of hours in the month of all devices – Total Downtime(in hours of all devices in avg) *100

   Total No. of Hours in the month

   Average uptime/downtime of each device/component as mentioned in point no 3 of this Annexure.

3. For the purpose of measurement, "**downtime**" or "**fault duration**" constitutes any period of time during which the network connection is not useable for Data, Voice & Video. Causes of downtime include:

   - Network connection equipment failures, supplied by Bidder to Jamia Hamdard.
   - Process failure
   - Local loop failure in cables.
   - Access Point, Access Switch, Network & Video Conferencing Infrastructure or any other fault/failure.
   - Any failure in the entire solution provided.
   - Cable fault in the network e.g. LAN cable, internal OFC patch cords, patch panel etc.

4. If the network uptime for the applicable year is below the uptime of 98%, then a penalty .5 % of Project value will have to be paid by the Bidder. For this purpose the number of days in a year is taken as 365 leading to a total duration of 8760 hours per year..
5. All change requests will be routed to Bidder for next 3 years and will be taken care by Bidder as a part of warranty with zero Cost.
   a. You have to share the 24*7 Helpline numbers to us. **There must an email as well as Telephone Helpline from Bidder.**
   b. Turnaround time for completion of any Change request will be 4 hrs. **Any deviation will attract a penalty of Rs 300 per day.**

6. Vendor to depute **One Networking Resources** with >3 years of Networking Experience for day to day operations and changes in the Network. They will report to designated team as per Jamia Hamdard instructions. The Engineer will be in Jamia Hamdard on Monday to Friday from 9:00 AM to 6 PM.

7. Issue response time must be 2 hour.
8. Issue resolution time must be same Business day. Any deviation will attract a penalty of Rs 500 Per day.
9. You will provide one week training to Computer Center team on the entire setup of this project..
10. Any spare replacement will be competed in next Business day. Any deviation will attract a penalty of Rs 500 per day.
11. The Contractor shall take immediate action to carry out any rectification work and restore the installation to its normal operating conditions upon receipt of the complaint from the officer in-charge of the END-USER or his representatives. If no action is taken to carry out the repair work within twenty four hours upon lodging of the report, the Jamia Hamdard shall reserve the right to engage a third party to carry out the rectification works with all the costs and expenses charged to the Contractor.
12. A comprehensive SLA report must be submitted by the SI by the end of every Month.

Annexure IV - Passive Work Specification

REFERENCE STANDARDS

The following ANSI/TIA/EIA Standards.

1) This Technical Specification and Associated Drawings
2) ANSI/TIA/EIA/568-C.1, Commercial Building Telecommunications Cabling Standard – 2009
3) ANSI/TIA/EIA 568-C.3, Optical Fiber Cabling Components Standard
4) ANSI/TIA/EIA-569-B, Commercial Building Standard for Telecommunications Pathways and Spaces
5) ANSI/TIA/EIA-606-A, Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
6) ANSI/J-STD-607-A, Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications
7) Building Industries Consulting Services International (BICSI) Telecommunications Distribution Methods Manual (TDMM)
8) ANSI/TIA-942, Telecommunications Infrastructure Standard for Data Centers

The Contractor is responsible to determine and adhere to the most recent edition of these standards when developing their responses in accordance with non commercial building meant for education

- **OEM should have direct presence in India more than at-least 10 years (Supporting documents required)**
- **OEM should have stood at no. 1 position at least once in structured cabling market from last 10 years.(Please provide supporting documents)**
- **OEM should have members participating in International Standard Bodies like EIA/TIA, ISO/IEC**
- **OEM should be a member of Telecommunications Industry Association (TIA) Information and Communications Technology (ICT)**
- **All material should be from one OEM make only**

Following three OEM's are the preferred ones for passive components:

1. **Tyco**
2. **Panduit**
3. **Systimax**

Annexure V- TECHNICAL SPECIFICATION FOR COPPER COMPONENTS

FOR TECHNICAL BID AND COMPLIANCE STATEMENT FOR UTP CABLING SYSTEM

UTP CABLING SYSTEM

S No.	Details	Specification	Compliance	Deviation
1	**Type**	Unshielded twisted pair cabling system, Certificate by Intertek (ETL) for the 4-Connectors channel testing to the Cat 6 Cabling system as per the ANSI/TIA 568 C.2 & as well as the ISO 11801 standards up to 550 MHz or more		
2	**Networks Supported**	10 / 100/1000 Ethernet, 155 Mbps ATM, 1000 Mbps IEEE 802.3ab Ethernet, and proposed Cat 6 Gigabit Ethernet		
3	**TIA / EIA 568 C.2**	ETL Verified / UL Listed		
4	**Warranty**	25 year systems warranty; Warranty to cover Bandwidth of the specified and installed cabling system, and the installation costs		
5	**Performance characteristics to be provided along with bid**	(a) Attenuation, Pair-to-pair and PS NEXT, ELFEXT and PSELFEXT, Return Loss, ACR and PS ACR for 4-connector channel		
		(b) Should perform to CAT6 with short channel		
		(c) 4-Connectors channel testing to the Cat 6 Cabling system as per the ANSI/TIA 568 C.2 & as well as the ISO 11801 standards up to 500 MHz or more		
		(d) CAT6 cabling system should be tested and verified by the Independent third party laboratories for Zero BER (Bit Error Rate) testing at the data transmission speed of 1 Gbit/s.		

UTP CABLE, Cat 6

S.No.	Details	Specification	Compliance	Deviation
1	**Type**	Unshielded Twisted Pair, Category 6, TIA / EIA 568-C.2 & ISO/IEC 11801		
2	**Conductors**	23 AWG solid bare copper		
3	**Insulation**	Polyethylene		
4	**Jacket**	Flame Retardant PVC		
	Pair Separator	Cross-member **(+)** fluted Spine/isolator for uniform separation for all pairs.		
5	**Approvals**	(a) UL Listed / UL Verified		
		(b) ETL verified to TIA / EIA Cat 6		
6	**Operating temperature**	-20 Deg. C to +60 Deg. C		
7	**Frequency tested up to**	Minimum 500 MHz or higher		
8	**Packing**	Box of 305 meters		
9	**Bend Radius**	4 * Cable Diameter		
10	**UL/NEC Ratings**	NEC 800 CMR Rated or IEC 60332-1 and UL 1666		
11	**Performance characteristics to be provided along with bid**	Attenuation, Pair-to-pair and PS NEXT, ELFEXT and PSELFEXT, Return Loss, ACR and PS ACR		
12	**ROHS Compliance**	ROHS Complaint		

Cat 6, UTP JACKS

S No.	Details	Specification	Compliance	Deviation

1	**Type**	PCB based, Unshielded Twisted Pair, Category 6, TIA /EIA 568-C.2 and ISO/IEC 11801		
2	**Modular Jack**	750 mating cycles		
3	**Wire terminal**	200 termination cycles		
4	**Accessories**	Integrated bend-limiting strain-relief unit for cable entry or other mechanism to reduce the strain and bends at cable entry		
		Integrated hinged dust cover		
		Support cable pair termination process on the jacks at 45, 90 or 180 degree angle.		
		Bidder should have a mechanism to maintain the quality of the termination ir-respective of the skill level of the termination staff.		
5	**Housing**	Polyphenylene oxide, 94V-0 rated.		
6	**110 Blocks**	polycarbonate, 94V-0 rated		
7	**Jack contacts**	Beryllium copper, plated with 1.27 mm [.000050] thick gold in localized area and 3.81 mm [.000150] minimum thick tin-lead in solder area over 1.27 mm [.000050] minimum thick nickel under plate		
8	**Wiring blocks**	Polycarbonate, 94V-0 rated		
9	**Approvals**	(a) UL Listed / CSA Approved		
		(b) ETL verified to TIA / EIA Cat 6		
10	**Performance Characteristics to be provided with bid**	Attenuation, NEXT, PS NEXT, FEXT and Return Loss		
11	**ROHS Compliance**	ROHS compliant		

UTP Jack Unloaded Panels, Cat 6

S No.	Details	Specification	Compliance	Deviation
1	**Type**	24port, 1U, Unloaded Modular, PCB based, Unshielded Twisted Pair, Category 6, TIA / EIA 568-C.2 and ISO/IEC 11801		
2	**Ports**	24/48		
3	**Port arrangement**	Configured as 6 Port Module with individually replaceable CAT-6 Jacks		
4	**Circuit Identification**	Front of each module shall be capable of accepting labels		
5	**Port Identification**	Labels on each of 48-ports (to be included in supply		
6	**Modular Jack**	750 mating cycles		
7	**Wire terminal**	200 termination cycles		
8	**Accessories**	Integrated bend-limiting strain-relief unit for cable entry or other mechanism to reduce the strain and bends at cable entry		
9	**Materials**			
	Housing	Polyphenylene oxide, 94V-0 rated		
	Wiring blocks	Polycarbonate, 94V-0 rated		
	Jack contacts	Beryllium copper, plated with 1.27 mm [.000050] thick gold in localized area and 3.81 mm [.000150] minimum thick tin-lead in solder area over 1.27 mm [.000050] minimum thick nickel under plate		
	Panel	Black, powder coated steel		
10	**Approvals**	UL listed / ETL Verified		
11	**Termination Pattern**	TIA / EIA 568 A and B;		
12	**ROHS Compliant**	ROHS/ELV Compliant		

WORKSTATION / EQUIPMENT PATCH CORDS

S.No.	Details	Specification	Compliance	Deviation
1	**Type**	Unshielded Twisted Pair, Category 6, TIA / EIA 568-C.2 & ISO/IEC 11801		
2	**Conductor**	24 AWG 7 / 32, stranded copper conductors 100 Ohm		
3	**Length**	4 feet, 7 feet, 10 feet		
4	**Plug Protection**	Transparent/clear/anti snag Slim boot		
5	**Warranty**	25-year component		
6	**Jacket**	CM Rated		
7	**ROHS Compliance**	ROHS/ELV Complaint		

FACEPLATE

S No.	Details	Specification	Compliance	Deviation
1	**Type**	**Single Gang, US style, 2.5 x 4 inches**		
2	**Material**	ABS / UL94 V-0		
3	**No. of ports**	Two/Four/Six		
4	**Holder, Jack**	ABS UL 94V-0		
5	**Cover Label**	Acrylic UL94V-0		
6	**ROHS Compliance**	ROHS/ELV Complaint		

ANNEXURE VI – FOR FIBRE COMPONENTS

6 Core Single mode Outdoor Fiber- Constructed from B1.3 optical fibre or above (also known as ITU specification G.652c or G.652d or above). <u>The Fiber should support 10 G and upto 40 G of bandwidth.</u>

Sr No.	Specifications	Requirement	Compliance	Deviation
1	**Cable Type**	6 - core Single Mode, Armoured, Loose-tube, Gel filled		
2	**Fibre Type**	Single Mode, 9/125 micron primary coated buffers		
3	**No. of cores**	6		
4	**Armour**	Corrugated Steel Tape		
5	**Cable Construction Type**	BELLCORE GR 20 / IEC 794-1		
6	**Attenuation**	@ 1310nm<= 0.40 db/KM Typical <=0.50 MAX		
		@1550nm <= 0.30 dB/KM Typical <=0.40 MAX		
7	**Cut Off Wave length**	<1260		
8	**Mode Field Diameter**	@ 1310nm 9.3 + - 0.5		
		@1550nm 10.5 + - 1.0		
9	**Clad Diameter (um)**	125 + - 1		
10	**Concentricity (um)**	<=0.6		
11	**NON-Circularity (%)**	<=1		
12	**Coat Diameter**	245 + - 10		

13	**Zero Dispersion Wavelength (um)**	1310 + - 10		
14	**Central Strength Member**	FRP Rod		
15	**Tensile Strength**	3500 Newtons		
16	**Crush Resistance**	4000 Newtons		
17	**Bend Radius (Installation/Unloaded)**	10 D / 20 D		
18	**Cable Diameter**	15.0 + - 0.5 mm		
19	**Lose Tube Diameter**	3.0 + - 0.15 mm		
20	**Operating Temperature**	-20 Degree C to +70 Degree C		
21	**Safety Parameter**	Shall be flame retardant as per IEC 60332-3 & LSZH AS PER IEC 61034-2 & IEC60754-2. Third party reports shall be submitted for the same.		

Fiber Optic LIU with Pigtails, Splice Trays& Splice Protectors (Fully Loaded)

S No.	Specifications	Requirement	Compliance	Deviation
1	**Connector Type**	**SC/LC-Style, Simplex**		
2	**Operating temperature**	-40 Degree C to +85 Degree C		
3	**Durability & color**			
3	**MM connectors**	500 cycles, Beige		
4	**SM connectors**	220 cycles, Blue		
5	**Ferrules**	Pre-radiused Ceramic Ferrules		
6	**Attenuation**	Not more than 0.75 dB per mated pair		
7	**Fiber Optic Patch panels**			
8	**FMS- Front Patching / Splicing Shelf**	1U • 19" / ETSI versions available		
		The FMS fiber management shelf series is ideal for high density front patching applications.		
		Its compact design and high density capacity allows it to deliver carrier class fiber management to central offices, Pops, FTTx, mobile systems and LANs.		
		• High Density:		
		1U: 12/24 Fiber terminations		
		• Should be supplied loaded with secondary coated SC/LC pigtails		
		• Mounting brackets can be placed in different positions		
9	**• Drawer concept allows f**	o Easy access to splicing tray		
		o Easy access to back side of connector		
		• Trays with hinges(book type) which allows facilitates easy fiber management and greater access during installation and rework		
		• Fiber guides, radius controls & secure tie downs provided		
10	**Dimensions**	Width- 450mm & Depth-280 mm,Height–44mm		
12	**Color**	**RAL 7035 / Black**		

LC to LC Patch Cord Single Mode

Sr No.	Specifications	Requirement	Compliance	Deviation
1	**Make and Type–**	LC to LC Duplex Fiber Optic Patch Cord, 9/125 micron		
2	**Cable Sheath**	LSZH		
3	**Cable Diameter**	1.8 mm mini twin zip		
4	**Ferrule**	Ceramic		
5	**Return Loss**	> 45 db		
6	**Insertion Loss**	.1 db Typical Max .3 db		
7	**Length**	3/5/10 meters.		
8	**ROHS**	ROHS Compliant		

ANNEXURE VII – Fiber Layout and other Specification

Fiber Layout and other Specifications	Compliance (Yes/No /Deviations)
In-Building fibre laying should be done ensuring redundancy of Fiber cores at the distribution and access level.	
Ferruling/tagging of fibre and other cables should be done at all the required places.	
Complete documentation including configuration, layout map, specifications etc to be provider by Contractor	
Specifications to be adhered by the Vendor while commissioning optical fiber network.	
Guidelines: Vendor shall undertake outdoor OFC installation work as per the guidelines listed in successive sub-paragraphs:	
The cable should not be twisted during the installation. Twisting of the cable can stress the fibers.	
The optical fiber shall be terminated by the Vendor at Edge switch locations (also known as cable drop location) as per the arrangement.	
o Details of Installation/ Commissioning: Vendor should undertake to implement the project, strictly as per schedule given under:	
o Delivery of equipment/accessories at the project location (i.e. Jamia Hamdard) should be completed within 4 weeks from the effective date of contract.	
o Details of Technical Documentation: Soft and hard copies of Tech Manual/ User Handbook will be submitted by Vendor along with the equipment/ items as ordered in the supply order. The following documents are also required along with tech bid.	
a. The route shall be as straight and as short as possible.	
b. The route shall have minimum obstacles in order to minimise reinstatement cost.	
The final survey report shall have to be approved by the Jamia Hamdard need to be obtained before the cable installation work is commenced. For the routes where the Jamia Hamdard has finalised the route for installation of HDPE pipe visà-vis the underground OFC or where HDPE pipe is already installed by the Jamia Hamdard/Owner, the Contractornk will survey the route to facilitate installation of optical fibre cable, and submit the final survey report as per above description.	
Fiber should be laid supporting from 1 G to 10 G	

Warranty

Jamia Hamdard seeks warranty for the installed cable plant from the OEM equipment supplier. Bidder shall ensure that the OEM norms for supply, installation, testing and documentation as specified by the OEM supplier shall be adhered to, provided those are in line with TIA / EIA standards and Owner requirement specifications. The warranty shall be provided by the OEM vendor to Jamia Hamdard and shall be administered in India. The duration of the warranty shall be for a minimum of 25 years on structured cabling.

ANNEXURE VIII – Indoor AP Specifications

Indoor AP with 802.11ac			
Features	**Specifications**	**Compliance (Yes\No)**	**Deviation**
Hardware	1. Access Points proposed must include radios for 2.4 GHz and 5 GHz with 802.11 ac.		
	2. Must have a robust design for durability, without visible vents		
	3. Must include dual band **external antennas** to support both the 2.4GHz and 5GHz operations simultaneously from single antenna.		
Support	4. Must support 3x3:3 multiple-input multiple-output (MIMO) with three spatial streams. 4x4:3 multiple-input multiple-output (MIMO) with three spatial streams will be preffered.		
	5. Must support simultaneous 802.11 n on both the 2.4 GHz and 5 GHz radios.		
	6. Must support 802.11ac on the integrated 5-GHz radio		
	Access Points should support all versions of 802.11a, 802.11b, 802.11n		
	The Access Point should be modular and hence field upgradable to next version of 802.11 ac where bandwidth support will be more than 2.3 Gbps. It should not be a case that Access Point will need to be rip and replaced incase of upgrading to next version of 802.11 ac that supports >2.3 Gbps bandwidth throughput.		
	Should support BPSK, QPSK, 16-QAM, 64-QAM and 256-QAM modulation types		
	Access point should support 802.3at POE+ standard.		
	WPC certificate needs to be submitted along with the AP Specification Complaince		
	7. Must support data rates up 450 mbps on 802.11 n and 1.3 Gbps on 802.11ac.Must support up to 23dbm of transmit power in both 2.4Ghz and 5Ghz radios incase of Wave 1. Incase of upgradation to next version of 802,11 ac requirement in future, same AP should support data rate more than 2.3 Gbps.		
RF	8. The Wireless AP should have the technology to improve downlink performance to all mobile devices including one-, two-, and three spatial stream devices on 802.11n and 802.11ac. The technology should work without requiring feedback from clients and should work with all existing 802.11 clients.		

	9. Should s support detecting and classifying non-Wi-Fi wireless transmissions while simultaneously serving network traffic		
	10. Should support configuring the access point as network connected sensor to access any network location covered by the access point to get real-time Spectrum analysis data.		
	11. Must support AP enforced load-balance between 2.4Ghz and 5Ghz band.		
	12. Should support and incorporate radio resource management for power, channel, coverage hole detection and performance optimization		
	13. Should support spectrum analysis and security scanning using a dedicated hardware separate from the radio serving the clients, with four, four multiple-input multiple-output (MIMO) technology		
	14. Should be able to detect at least 20 sources of non 802.11 interference		
Roaming	15. Must support Proactive Key Caching and/or other methods for Fast Secure Roaming.		
Security	16. Must support Management Frame Protection.		
	17. Should support locally-significant certificates on the APs using a Public Key Infrastructure (PKI).		
	18. Must operate as a sensor for wireless IPS		
	19. Should support Off-Channel Rogue Detection and Containment for both radio		
Encryption	20. Access Points must support a distributed encryption/decryption model.		
	21. Access Points must support Hardware-based DTLS encryption on CAPWAP Standard		
Monitoring	22. Must support the ability to serve clients and monitor the RF environment concurrently.		
	23. Same model AP that serves clients must be able to be dedicated to monitoring the RF environment.		
Flexibility	24. AP model proposed must be able to be both a client-serving AP and a monitor-only AP for Intrusion Prevention services.		
	25. Should support mesh capabilities for temporary connectivity in areas with no Ethernet cabling.		
	26. Mesh support should support QoS for voice over wireless.		
	27. Must support 16 WLANs per AP for SSID deployment flexibility.		
	Must support minimum of 16 SSID's per AP.		
	28. Must continue serving clients when WAN link to controller is back up again, should not reboot before		

	joining		
	29. Should support Local authentication at the AP level in case of WAN outage		
Operational	30. Must support telnet and/or SSH login to APs directly for troubleshooting flexibility.		
Power	31. Must support Power over Ethernet, local power, and power injectors.		
	32. Must operate at 3x3 or higher with 802.3af PoE is the source of power		
Quality of Service	33. 802.11e and WMM		
	34. Wi-Fi Alliance Certification for WMM and WMM power save		
	35. Must support Reliable Multicast Video to maintain video quality		
	36. Must support QoS and Call Admission Control capabilities.		
	37. Access Point should 802.11 DFS certified		

ANNEXURE IX – Access Switch Technical Specification (Type – I)

Access Switch Technical Specification			
Switch Architecture and Features		**Compliance (Yes/No)**	**Deviation**
1.	The Switch should have atleast 24 10/100/1000 downlink POE ports		
2.	The Switch should have 2*10 G Uplink on SFP + ports and 2*1G on SFP from day 1.		
3.	The Switch should be capable to run in either in Wireless Controller Mode or Wireless data plane terminating mode or both.		
4.	The Switch should support Redundant Power Supplies.		
5.	The Switch should be capable of terminating wireless control plane from locally connected AP's.		
6.	The Switch should be Stackable		
7.	The Switch Architecture should be able to Stack atleast 4 Switches together.		
8.	The Switch stack should be based on Distributed forwarding Architecture, where in each stack member forwards its own information on network.		
9.	The Switch Stack Architecture should have centralized control and Management plane with Active Switch and all the information should be Synchronized with Standby Switch.		
10.	The Switch should support Stateful Switchover (SSO) when switching over from Active to Standby switch in a Stack.		
11.	The Switch Stack Architecture should be Plug & Play for attaching or removing any switch from the stack without any downtime.		
12.	The Switch Stack Architecture should allow the end user to stack 24 Port Switch with 48 Port of the same model.		
13.	The Swich should be based on a Modular OS Architecture capable of hosting applications.		
14.	The Switch should have Multicore CPU Architecture.		
15.	The Switch should have atleast 1 10/100/1000 dedicated Ethernet Management Port		
16.	The Switch should have atleast 3 fans and incase of failure of any one of those the other fans should automatically speed up. Fans should be field replaceable.		
17.	The Switch should have power savings mechanism wherein it should reduce the power consumption on ports not being used.		
18.	The switch should be Rack Mountable and should not take space more than 1RU.		
19.	The Switch should have atleast 85 G nonblocking switching bandwidth.		

20.	The switch should have atleast 65 or moreMpps of forwarding rate.		
21.	The Switch should support atleast 4000 VLAN ID's & 500 SVI's.		
22.	**Layer 2 /3 Features**		
23.	The Switch should be able to discover (on both IPv4 & IPv6 Network) the neighboring device giving the details about the platform, IP Address, Link connected through etc, thus helping in troubleshooting connectivity problems..		
24.	The switch should support Detection of Unidirectional Links (in case of fiber cut) and to disable them to avoid problems such as spanning-tree loops.		
25.	The switch should support centralized VLAN Management, VLANs created on the core switch should be propogated automatically.		
26.	The switch should support 802.1d, 802.1s, 802.1w Spanning-Tree & itsEnhancement for fast convergence.		
27.	The switch should support 802.1q VLAN encapsulation.		
28.	The switch should support 802.3ad (LACP) to combine multiple network links for increasing throughput and providing redundancy.		
29.	The switch should support Inter-VLAN routing		
30.	The switch should support IPv4 unicast Static Routing		
31.	The switch should support 16 IPv4 Static routes		
32.	The switch should be on the approved list of IPv6 Ready Logo phase II - Host		
33.	The switch should support IPv6 unicast routing - static routing		
34.	The switch should support IPv6 Host support for IPv6 Addressing		
35.	The switch should support IPv6 Host support for IPv6 Option processing		
36.	The switch should support IPv6 Host support for IPv6 Fragmentation		
37.	The switch should support IPv6 Host support for IPv6 ICMPv6		
38.	The switch should support IPv6 Host support for IPv6 TCP/UDP over IPv6		
39.	The switch should support IPv6 Host support for IPv6 Ping		
40.	The switch should support IPv6 Host support for IPv6 Traceroute		
41.	The switch should support IPv6 Host support for IPv6 VTY		
42.	The switch should support IPv6 Host support for IPv6 SSH		
43.	The switch should support IPv6 Host support for IPv6 TFTP,		
44.	**Network Security Features**		
45.	The switch should have Port security to secure the access to an access or trunk port based on MAC address to limit the number of learned MAC addresses to deny MAC address flooding.		
46.	The switch should support DHCP snooping to prevent malicious users from spoofing a DHCP server and sending out rouge addresses.		
47.	The switch should support Dynamic ARP inspection (DAI) to ensure user integrity by preventing malicious users from exploiting the insecure nature of ARP.		

48.	The switch should support IP source guard to prevent a malicious user from spoofing or taking over another user's IP address by creating a binding table between the client's IP and MAC address, port, and VLAN.		
49.	The switch should support Unicast Reverse Path Forwarding (RPF) feature to mitigate problems caused by the introduction of malformed or forged (spoofed) IP source addresses into a network by discarding IP packets that lack a verifiable IP source address.		
50.	The switch should support Bidirectional data support on the SPAN port to allow the intrusion detection system (IDS) to take action when an intruder is detected.		
51.	The switch should support flexible & multiple authentication mechanism, including 802.1X, MAC authentication bypass, and web authentication using a single, consistent configuration.		
52.	The switch shoud support RADIUS change of authorization and downloadable Access List for comprehensive policy management capabilities.		
53.	The switch should support Private VLANs to restrict traffic between hosts in a common segment by segregating traffic at Layer 2, turning a broadcast segment into a nonbroadcast multiaccess like segment to provide security & isolation between switch ports, which helps ensure that users cannot snoop on other users' traffic.		
54.	The switch should support Multidomain authentication to allow an IP phone and a PC to authenticate on the same switch port while placing them on appropriate voice and data VLAN.		
55.	The switch should support MAC address notification to allow administrators to be notified of users added to or removed from the network.		
56.	The switch should support IGMP filtering to provide multicast authentication by filtering out nonsubscribers and limits the number of concurrent multicast streams available per port.		
57.	The switch should support VLAN ACLs on all VLANs prevent unauthorized data flows from being bridged within VLANs.		
58.	**Wireless Features**		
59.	The Switch should be capable of terminating AP locally per switch or in a Stack.		
60.	The Switch should be compatible to run in Wireless data plan terminating mode with external wireless controller of the same OEM.		
61.	The Switch should have capability to maintain database of locally served clients which should be shared with other Wireless Appliances within a network for fast roaming.		

62.	The Multiple switch when running in Controller mode should be capable of creating a virtual Mobility groups to enabling fast roaming of clients across different controller with in a network		
63.	The Multiple Switch when running as Wireless data plan terminating points should be capable of creating logical fully mesh groups to enable fast roaming within or across the multiple groups.		
64.	The Switch should support both L3 & L2 roams with in a network.		
65.	The Switch should support all Wireless Authentication Mechanism, IEEE 802.11i - EAP-TLS, EAP-SIM, EAP-TTLS, WPA, WPA2, 802.1x, WEP, WPA2-Enterprise, etc and other standards.		
66.	The switch should support 2.4 GHz and 5GHz frequency APs		
67.	The Switch should be capable of supporting IEEE 802.11ac		
68.	The switch should facilitate efficient Power and Channel Management to the respective regulatory domains.		
69.	The Switch should support Mitigation of non WiFi inteference's.		
70.	The Switch should support IEEE802.11r for Management Frame Protection		
71.	The Switch should support IEEE802.11v for Network Power Save Client		
72.	**Quality of Service (QoS) & Control**		
73.	The Switch should support Advanced Modular Wired and Wireless QoS Policies		
74.	The Switch should have a inbuilt mechanism to distribute bandwidth amongst wireless clients to ensure all users have a fair share on bandwidth.		
75.	The Switch should be capable of deploying QoS policies at multiple levels based on AP, Radio, SSID & clients who are directly connected to the switch.		
76.	The Switch should be capable of Downloading Downloadable Access List from network security engine based on user identity.		
77.	The Switch should be capable of Queuing, Policing, Shaping and marking Wired and Wireless Traffic based on Class of Service (CoS) or DSCP.		
78.	The switch should support IP SLA feature set to verify services guarantee based on business critical IP Applications		
79.	**Standards & Compliance (Switch Should support all the mentioned Standards)**		
80.	IEEE 802.1s		
81.	IEEE 802.1w		
82.	IEEE 802.1x		
83.	IEEE 802.11		
84.	IEEE 802.1x-Rev		

85.	IEEE 802.3ad		
86.	IEEE 802.3af		
87.	IEEE 802.3at		
88.	IEEE 802.3x full duplex on 10BASE-T, 100BASE-TX, and 1000BASE-T ports		
89.	IEEE 802.1D Spanning Tree Protocol		
90.	IEEE 802.1p CoS Prioritization		
91.	IEEE 802.1Q VLAN		
92.	IEEE 802.3 10BASE-T specification		
93.	IEEE 802.3u 100BASE-TX specification		
94.	IEEE 802.3ab 1000BASE-T specification		
95.	IEEE 802.3z 1000BASE-X specification		
96.	RMON I and II standards		
97.	SNMPv1, SNMPv2c, and SNMPv3		

ANNEXURE X – Access Switch Technical Specification (Type-II)

Access Switch Technical Specification			
Switch Architecture and Features		**Compliance (Yes/No)**	**Deviation**
1.	The Switch should have atleast 24 10/100/1000 downlink Ports		
2.	The Switch should have 2*10 G Uplink on SFP + ports and 2*1G on SFP from day 1.		
3.	The Switch should be capable to run in either in Wireless Controller Mode or Wireless data plane terminating mode or both.		
4.	The Switch should support Redundant Power Supplies.		
5.	The Switch should be capable of terminating wireless control plane from locally connected AP's.		
6.	The Switch should be Stackable		
7.	The Switch Architecture should be able to Stack atleast 4 Switches together.		
8.	The Switch stack should be based on Distributed forwarding Architecture, where in each stack member forwards its own information on network.		
9.	The Switch Stack Architecture should have centralized control and Management plane with Active Switch and all the information should be Synchronized with Standby Switch.		
10.	The Switch should support Stateful Switchover (SSO) when switching over from Active to Standby switch in a Stack.		
11.	The Switch Stack Architecture should be Plug & Play for attaching or removing any switch from the stack without any downtime.		

12.	The Switch Stack Architecture should allow the end user to stack 24 Port Switch with 48 Port of the same model.		
13.	The Swich should be based on a Modular OS Architecture capable of hosting applications.		
14.	The Switch should have Multicore CPU Architecture.		
15.	The Switch should have atleast 1 10/100/1000 dedicated Ethernet Management Port		
16.	The Switch should have atleast 3 fans and incase of failure of any one of those the other fans should automatically speed up. Fans should be field replaceable.		
17.	The Switch should have power savings mechanism wherein it should reduce the power consumption on ports not being used.		
18.	The switch should be Rack Mountable and should not take space more than 1RU.		
19.	The Switch should have atleast 85 G nonblocking switching bandwidth.		
20.	The switch should have atleast 65 or moreMpps of forwarding rate.		
21.	The Switch should support atleast 4000 VLAN ID's & 500 SVI's.		
22.	**Layer 2 /3 Features**		
23.	The Switch should be able to discover (on both IPv4 & IPv6 Network) the neighboring device giving the details about the platform, IP Address, Link connected through etc, thus helping in troubleshooting connectivity problems..		
24.	The switch should support Detection of Unidirectional Links (in case of fiber cut) and to disable them to avoid problems such as spanning-tree loops.		
25.	The switch should support centralized VLAN Management, VLANs created on the core switch should be propogated automatically.		
26.	The switch should support 802.1d, 802.1s, 802.1w Spanning-Tree & itsEnhancement for fast convergence.		
27.	The switch should support 802.1q VLAN encapsulation.		
28.	The switch should support 802.3ad (LACP) to combine multiple network links for increasing throughput and providing redundancy.		
29.	The switch should support Inter-VLAN routing		
30.	The switch should support IPv4 unicast Static Routing		
31.	The switch should support 16 IPv4 Static routes		
32.	The switch should be on the approved list of IPv6 Ready Logo phase II - Host		
33.	The switch should support IPv6 unicast routing - static routing		
34.	The switch should support IPv6 Host support for IPv6 Addressing		
35.	The switch should support IPv6 Host support for IPv6 Option processing		
36.	The switch should support IPv6 Host support for IPv6 Fragmentation		
37.	The switch should support IPv6 Host support for IPv6 ICMPv6		

38.	The switch should support IPv6 Host support for IPv6 TCP/UDP over IPv6		
39.	The switch should support IPv6 Host support for IPv6 Ping		
40.	The switch should support IPv6 Host support for IPv6 Traceroute		
41.	The switch should support IPv6 Host support for IPv6 VTY		
42.	The switch should support IPv6 Host support for IPv6 SSH		
43.	The switch should support IPv6 Host support for IPv6 TFTP,		
44.	**Network Security Features**		
45.	The switch should have Port security to secure the access to an access or trunk port based on MAC address to limit the number of learned MAC addresses to deny MAC address flooding.		
46.	The switch should support DHCP snooping to prevent malicious users from spoofing a DHCP server and sending out rouge addresses.		
47.	The switch should support Dynamic ARP inspection (DAI) to ensure user integrity by preventing malicious users from exploiting the insecure nature of ARP.		
48.	The switch should support IP source guard to prevent a malicious user from spoofing or taking over another user's IP address by creating a binding table between the client's IP and MAC address, port, and VLAN.		
49.	The switch should support Unicast Reverse Path Forwarding (RPF) feature to mitigate problems caused by the introduction of malformed or forged (spoofed) IP source addresses into a network by discarding IP packets that lack a verifiable IP source address.		
50.	The switch should support Bidirectional data support on the SPAN port to allow the intrusion detection system (IDS) to take action when an intruder is detected.		
51.	The switch should support flexible & multiple authentication mechanism, including 802.1X, MAC authentication bypass, and web authentication using a single, consistent configuration.		
52.	The switch shoud support RADIUS change of authorization and downloadable Access List for comprehensive policy management capabilities.		
53.	The switch should support Private VLANs to restrict traffic between hosts in a common segment by segregating traffic at Layer 2, turning a broadcast segment into a nonbroadcast multiaccess like segment to provide security & isolation between switch ports, which helps ensure that users cannot snoop on other users' traffic.		
54.	The switch should support Multidomain authentication to allow an IP phone and a PC to authenticate on the same switch port while placing them on appropriate voice and data VLAN.		
55.	The switch should support MAC address notification to allow administrators to be notified of users added to or removed from the network.		

56.	The switch should support IGMP filtering to provide multicast authentication by filtering out nonsubscribers and limits the number of concurrent multicast streams available per port.		
57.	The switch should support VLAN ACLs on all VLANs prevent unauthorized data flows from being bridged within VLANs.		
58.	**Wireless Features**		
59.	The Switch should be capable of terminating AP locally per switch or in a Stack.		
60.	The Switch should be compatible to run in Wireless data plan terminating mode with external wireless controller of the same OEM.		
61.	The Switch should have capability to maintain database of locally served clients which should be shared with other Wireless Appliances within a network for fast roaming.		
62.	The Multiple switch when running in Controller mode should be capable of creating a virtual Mobility groups to enabling fast roaming of clients across different controller with in a network		
63.	The Multiple Switch when running as Wireless data plan terminating points should be capable of creating logical fully mesh groups to enable fast roaming within or across the multiple groups.		
64.	The Switch should support both L3 & L2 roams with in a network.		
65.	The Switch should support all Wireless Authentication Mechanism, IEEE 802.11i - EAP-TLS, EAP-SIM, EAP-TTLS, WPA, WPA2, 802.1x, WEP, WPA2-Enterprise, etc and other standards.		
66.	The switch should support 2.4 GHz and 5GHz frequency APs		
67.	The Switch should be capable of supporting IEEE 802.11ac		
68.	The switch should facilitate efficient Power and Channel Management to the respective regulatory domains.		
69.	The Switch should support Mitigation of non WiFi inteference's.		
70.	The Switch should support IEEE802.11r for Management Frame Protection		
71.	The Switch should support IEEE802.11v for Network Power Save Client		
72.	**Quality of Service (QoS) & Control**		
73.	The Switch should support Advanced Modular Wired and Wireless QoS Policies		
74.	The Switch should have a inbuilt mechanism to distribute bandwidth amongst wireless clients to ensure all users have a fair share on bandwidth.		
75.	The Switch should be capable of deploying QoS policies at multiple levels based on AP, Radio, SSID & clients who are directly connected to the switch.		

76.	The Switch should be capable of Downloading Downloadable Access List from network security engine based on user identity.		
77.	The Switch should be capable of Queuing, Policing, Shaping and marking Wired and Wireless Traffic based on Class of Service (CoS) or DSCP.		
78.	The switch should support IP SLA feature set to verify services guarantee based on business critical IP Applications		
79.	**Standards & Compliance (Switch Should support all the mentioned Standards)**		
80.	IEEE 802.1s		
81.	IEEE 802.1w		
82.	IEEE 802.1x		
83.	IEEE 802.11		
84.	IEEE 802.1x-Rev		
85.	IEEE 802.3ad		
86.	IEEE 802.3x full duplex on 10BASE-T, 100BASE-TX, and 1000BASE-T ports		
87.	IEEE 802.1D Spanning Tree Protocol		
88.	IEEE 802.1p CoS Prioritization		
89.	IEEE 802.1Q VLAN		
90.	IEEE 802.3 10BASE-T specification		
91.	IEEE 802.3u 100BASE-TX specification		
92.	IEEE 802.3ab 1000BASE-T specification		
93.	IEEE 802.3z 1000BASE-X specification		
94.	RMON I and II standards		
95.	SNMPv1, SNMPv2c, and SNMPv3		

ANNEXURE XI – Video Conferencing Technical Specification – Type – I (Multipoint 1+4 Sites)

Specifications for HD (1080p @ 60fps) VC Endpoint.

The VC system should be standard based with separate camera system and HD audio video Interfaces.

S.No.	Features	Specifications	Compliance (Yes/No)
1	**Video**		
1.1	Video Standards	H.263,H.263+, H.264, **H.265**	
		H.264 in an Encrypted call should be possible	
		H.264 should be possible when sending or receiving two live video sources e.g. Presenter and Presentation.	
1.2	Video Frame Rate	Should support 60 fps with 1080p resolution in Motion mode.	
2	**Video Features**	Ability to send and receive two live simultaneous video sources in a single call, so that the image from the main camera and PC or document camera can be seen simultaneously.	
		Should support H.239 and BFCP protocols	
2.1	Video Output	Should have at least 3 no.'s of HD(High Definition) output to connect Full High Definition display devices such as plasma and projectors for both Video and content.	
		The unit must provide the flexibility to display video or content one any of the video output.	
2.2	Video Input	Should have one DVI (Digital Video Interface) input to connect PC/ Laptop directly to the Video conferencing system and display resolutions from WXGA (1280 x 768) to 1080p (1920 x 1080)	
		Should have at least 3 HDMI inputs to connect multiple HD cameras.	
		Support for 1080p 60fps has to be present on the HDMI inputs	
		The system must have the ability to pair mobile devices such as Tablets and Smartphones based on iOS or Android platforms so that these devices can be used for: 1) View the Presenttaion that is being shown in the VC call. 2) Add and disconnect call. 3) Take snapshot of the presnetation being shown	
		The system must have the ability to pair with laptop for sending content without any wires to the VC system	

3	**Advanced Video and Audio mixing Features**	In order to capcture the entire conference room view and also provide feed from additional video sources such a document camera and PC input, the VC unit must support the following:1) Combine the video feed from the main camera, Auxillary camera and PC input and stitch all the three into a single video and send the same to the remote site.2) Mixing capabilities to change the size of the video quadrants.3) Select a particular audio input and associate the same with a video input e.g. whiteboard and send only this audio feed to the remote site.The above can be a built-in feature or an additional Video mixer for at least 4 video inputs and 4 audio inputs can be provided. In order to maintain the video resolutions, additional scaler should also be provided if not buil-in to the unit.	
3.1	Other Desirable features	Noise Reduction, Automatic Gain control, Acoustic Echo Canceller, Active Lip syncronization	
3.2	Audio Inputs	should support 6 Microphone inputs to connect 6 microphones.	
		The system must have the capability to mix the audio from all the microphones and the line input and send the same to the far end side.	
		In case the audio mixing capability is not possible as a built-in feature, an additional external mixer may be supplied to provide audio mixing function.	
		The pick up of the microphones should be at least 10 feet from the microphone.	
		Echo Cancellation for every input must be available.	
3.3	Audio Outputs	Should support digital main audio output with the HDMI interface	
4	**Network Interfaces**	1 LAN /Ethernet--10/100/1000 Mbps full duplex	
5	**Bandwidth**	H323/SIP upto 6 Mbps point-to-point.	
6	**Network Capabilities**	Packet Loss Based Downspeeding	
7	**H.323/ IP Features**	QoS--DiffServe	
		IP adaptive bandwidth management (including flow control)	
		Auto Gatekeeper discovery	
		Auto Network Address Translation(NAT) support	
		Standards based- Packet Loss Recovery feature	
		Should support URL Dialling	
		Support for H.245 DTMF tones in H.323	
8	**Security**		
8.1	Menu Control	Password protected system menu	
8.2	Encryption of video call	ITU-T standards based Encryption of the video call	
		Call should be encrypted end-to-end on IP	

		Should support Standards-based: H.235 v2 & v3 and AES Encryption via Automatic key generation and exchange. The same should be available in a call with Video with presentation (dualvideo)	
		Ability to manually turn encryption On or OFF should be there.	
		Automatic key generation and exchange	
9	**Camera**	Should consists of two High Definition 1080p@60fps Cameras that can be connected simultaneosuly to the unit.	
		Each camera must have the ability to be mounted upside down so as to give better eye-eye contact.	
		The following technical features of the camera must be provided:	
		Minimum of 10 x optical zoom	
		1920 x 1080 pixels progressive @ 60fps	
		Must have a PTZ camera with +15°/-25° tilt, +/- 90° pan	
		The Camera and codec should be from the same manufacturer.	
		Should have at least 72 degrees static field of view.	
10	**Directory services**	Should support Local and Global directories	
		Should support LDAP and H.350 protocols for directory transfer.	
11	**External devices**	Should have USB port to connect external devices.	
		Should have RS232 port for management.	
12	**Multipoint Capability**	Must have built-in Multiconference capability to connect at least 1+4 sites at 720p in a continuous presence mode	
		All sites must be visible in a continuous presence mode with rate matching and transcoding such that different sites may connect at different speeds and protocols and still mainatin a resolution of at least 720p	

ANNEXURE XII – Video Conferencing Technical Specification – Type – II

Specifications for HD (1080p @ 60fps) VC Endpoint.

The VC system should be standard based with separate camera system and HD audio video Interfaces

S.No.	Features	Specifications	Compliance (Yes/No)
1	**Video**		
1.1	**Video Standards**	H.263,H.263+, H.264, **H.265**	
		H.264 in an Encrypted call should be possible	
		H.264 should be possible when sending or receiving two live video sources e.g. Presenter and Presentation.	
1.2	**Video Frame Rate**	Should support 60 fps with 1080p resolution in Motion mode.	
2	**Video Features**	Ability to send and receive two live simultaneous video sources in a single call, so that the image from the main camera and PC or document camera can be seen simultaneously.	
		Should support H.239 and BFCP protocols	
2.1	**Video Output**	Should have at least 3 no.'s of HD(High Definition) output to connect Full High Definition display devices such as plasma and projectors for both Video and content.	
		The unit must provide the flexibility to display video or content one any of the video output.	
2.2	**Video Input**	Should have one DVI (Digital Video Interface) input to connect PC/ Laptop directly to the Video conferencing system and display resolutions from WXGA (1280 x 768) to 1080p (1920 x 1080)	
		Should have at least 3 HDMI inputs to connect multiple HD cameras.	
		Support for 1080p 60fps has to be present on the HDMI inputs	
		The system must have the ability to pair mobile devices such as Tablets and Smartphones based on iOS or Android platforms so that these devices can be used for: 1) View the Presenttaion that is being shown in the VC call. 2) Add and disconnect call. 3) Take snapshot of the presnetation being shown	
		The system must have the ability to pair with laptop for sending content without any wires to the VC system	

3	**Advanced Video and Audio mixing Features**	In order to capcture the entire conference room view and also provide feed from additional video sources such a document camera and PC input, the VC unit must support the following: 1) Combine the video feed from the main camera, Auxillary camera and PC input and stitch all the three into a single video and send the same to the remote site. 2) Mixing capabilities to change the size of the video quadrants. 3) Select a particular audio input and associate the same with a video input e.g. whiteboard and send only this audio feed to the remote site. The above can be a built-in feature or an additional Video mixer for at least 4 video inputs and 4 audio inputs can be provided. In order to maintain the video resolutions, additional scaler should also be provided if not buil-in to the unit.	
3.1	Other Desirable features	Noise Reduction, Automatic Gain control, Acoustic Echo Canceller, Active Lip syncronization	
3.2	Audio Inputs	should support 6 Microphone inputs to connect 6 microphones.	
		The system must have the capability to mix the audio from all the microphones and the line input and send the same to the far end side.	
		In case the audio mixing capability is not possible as a built-in feature, an additional external mixer may be supplied to provide audio mixing function.	
		The pick up of the microphones should be at least 10 feet from the microphone.	
		Echo Cancellation for every input must be available.	
3.3	Audio Outputs	Should support digital main audio output with the HDMI interface	
4	**Network Interfaces**	1 LAN /Ethernet--10/100/1000 Mbps full duplex	
5	**Bandwidth**	H323/SIP upto 6 Mbps point-to-point.	
6	**Network Capabilities**	Packet Loss Based Downspeeding	
7	**H.323/ IP Features**	QoS--DiffServe	
		IP adaptive bandwidth management (including flow control)	
		Auto Gatekeeper discovery	
		Auto Network Address Translation(NAT) support	
		Standards based- Packet Loss Recovery feature	
		Should support URL Dialling	
		Support for H.245 DTMF tones in H.323	

8	**Security**		
8.1	**Menu Control**	Password protected system menu	
8.2	**Encryption of video call**	ITU-T standards based Encryption of the video call	
		Call should be encrypted end-to-end on IP	
		Should support Standards-based: H.235 v2 & v3 and AES Encryption via Automatic key generation and exchange. The same should be available in a call with Video with presentation (dualvideo)	
		Ability to manually turn encryption On or OFF should be there.	
		Automatic key generation and exchange	
9	**Camera**	Should consists of two High Definition 1080p@60fps Cameras that can be connected simultaneosuly to the unit.	
		Each camera must have the ability to be mounted upside down so as to give better eye-eye contact.	
		The following technical features of the camera must be provided:	
		Minimum of 10 x optical zoom	
		1920 x 1080 pixels progressive @ 60fps	
		Must have a PTZ camera with +15°/-25° tilt, +/- 90° pan	
		The Camera and codec should be from the same manufacturer.	
		Should have at least 72 degrees static field of view.	
10	**Directory services**	Should support Local and Global directories	
		Should support LDAP and H.350 protocols for directory transfer.	
11	**External devices**	Should have USB port to connect external devices.	
		Should have RS232 port for management.	

ANNEXURE XIII – Video Conferencing Technical Specification – Type – III

Specifications for HD (1080p @ 60fps) VC Endpoint.

The VC system should be standard based with separate camera system and HD audio video Interfaces
The VC system must provide Multi conferencing capability to connect at least 1+3 video sites

S.No.	Features	Specifications	Compliance (Yes/No)
1	**Video**		
1.1	Video Standards	H.263, H.263 +,**H.264**	
		H.264 in an Encrypted call should be possible	
		H.264 should be possible when sending or receiving two live video sources e.g. Presenter and Presentation.	
1.2	Video Frame Rate	Should support 60 fps with 1080p resolution in Motion mode.	
2	**Video Features**	Ability to send and receive two live simultaneous video sources in a single call, so that the image from the main camera and PC or document camera can be seen simultaneously.	
		Should support H.239 and BFCP protocols	
		The system must have the ability to pair mobile devices such as Tablest and Smartphones based on iOS or Android platforms so that these devices can be used for: 1) View the Presenttaion that is being shown in the VC call. 2) Add and disconnect call. 3) Take snapshot of the presnetation being shown	
		The system must have the ability to pair with laptop for sending content without any wires to the VC system	
3	Video Output	Should have at least 2no.'s of HDMI (High Definition Multimedia Interface) output to connect Full High Definition display devices such as plasma and projectors for both Video and Content.(Dual Monitor Support)	
4	Video Input	Should have DVI (Digital Video Interface) input to connect PC/ Laptop directly to the Video conferencing system and display resolutions from WXGA (1280 x 768) to 1080p (1920 x 1080)	
		Should have 1 HD video Input to connect the HD camera	
		Support for 1080p 60fps.	
5	**Audio**		
5.1	Audio standards supported	G.711, G.722,G.722.1, 64 kbps MPEG-4 AAC-LD standard must be supported..	

5.2	Other Desirable features	Noise Reduction, Automatic Gain control, Acoustic Echo Canceller, Active Lip syncronization	
5.3	Audio Inputs	should support 2 Microphone inputs	
		The pick up of the microphones should be at least 10 feet from the microphone.	
		Echo Cancellation for every input must be available.	
5.4	Audio Outputs	Should support digital main audio output with the HDMI interface	
6	**Network Interfaces**	1 LAN /Ethernet--10/100/1000 Mbps full duplex	
7	**Bandwidth**	H323/SIP upto 6 Mbps point-to-point.	
8	**Network Capabilities**	Packet Loss Based Downspeeding	
9	**H.323/ IP Features**	Differentiated Services(QOS):	
		IP adaptive bandwidth management (including flow control)	
		Auto Network Address Translation(NAT) support	
		Standards based- Packet Loss Recovery feature on H.323 call	
		Should support URL Dialling	
		Support for H.245 DTMF tones in H.323	
10	**Security**		
10.1	Menu Control	Password protected system menu	
10.2	Encryption of video call	ITU-T standards based Encryption of the video call	
		Call should be encrypted end-to-end on IP	
		Should support Standards-based: H.235 v2 & v3 and AES Encryption via Automatic key generation and exchange. The same should be available in a call with Video with presentation (dualvideo)	
		Ability to manually turn encryption On or OFF should be there.	
		Automatic key generation and exchange	
11	**Camera**	1/3" CMOS	
		Minimum of 10 x zoom	
		1920 x 1080 pixels progressive @ 60fps	
		Must have a PTZ camera with +15°/-25° tilt, +/- 90° pan	
		The Camera and codec should be from the same manufacturer.	
		Should have at least 72 degrees static field of view.	
12	**Directory services**	Should support Local and Global directories	
		Should support LDAP and H.350 protocols for directory transfer.	
13	**External devices**	Should have USB port to connect external devices.	
		Should have RS232/USB port for management.	

ANNEXURE XIV– Overall Solution

General Solution Specification			
Requirements	**Description**	**Compliance (Yes/No)**	**Deviation**
Logging and Reports	The Proposed solution then should allow user to access the internet/Intranet services and maintain a log of such users by storing User name, Mac Address/ IP Address/ Time of access etc. The system should give Comprehensive reports in a graphical format for decision making.		
Connectivity	SI will ensure a secure Wi-Fi connectivity and internet access through user Login ID and password to all the subscribers with central authentication mechanism.		
NMS	The SI will integrate with NMS and integrate it with Existing wired network devices and proposed Wireless network devices. Any required hardware for NMS Software to be provided by bidder.		
Documentation	Complete documentation and Project report should be submitted with all Network diagrams in a PPT and word Format.. All diagrams should be well marked with each and every component and easily understandable.		
Consistency	Consistent policy across wired, wireless, and VPN for managed and BYOD assets, revealing who and what are on the network		
Self Service	Integration Required for User-specific services, with self-service onboarding, guest handling, and location-based services		
Life Cycle Management	Integration Required for Lifecycle management that simplifies and automates infrastructure management tasks		
Hardware Replacement	Advance hardware replacement to be made available Next-business-day		
Reporting	Reporting (Integratin Required with Existing Appliance/Tools) - Reports identify which products have been moved, added, or changed in your installed base between two analysis/collection points in time, as well as changes to product alerts. Product Alert Reports should be available to show alerts between two analysis/collection points in period of time, such as from the last 30 days		

Wi-Fi Coverage	Wi-Fi network access should be available throughout the campus inside the buildings as well as in outdoor locations to all the staff, students and visitors of the Hospital based on well-defined access policy.		
General Terms and Conditions	Vendor to ensure that all indoor Access points need to be 802.11 ac		
	Bidder to ensure that supplied Access points should support end user standard i.e 802.11a/b/g/n.		
	Bidder to ensure that quoted 11ac AP is field upgradable to 2nd generation 11ac standard when it becomes available in market; Latest Access Point must be provided to Jamia Hamdard.		
	The System should support seam-less roaming within the mentioned location for users with mobile devices such as smart phones and tablets.		
	The network should support the user devices with 2.4 GHz as well as 5 GHz frequency band at the same time.		
	Integration Required to manage the Wi-Fi network from a central location though the wireless management system. The management system should preferably support unified wired and wireless network management, and BYOD (Bring your own device) solution. Vendor should be able to manage Wired and Wireless from a Centralized Solution		
	It should be possible to configure and deploy access points (Apes) remotely through existing controller		
	System should support multiple VLANS to support users with different privileges. Instead of one single large vlan(Broadcast domain),System must be able to have multiple small vlans will be grouped to map with single SSID without any external device.		
	It should be possible to map SSID to VLAN. Minimum 16 such profiles should be supported.		
	It should be possible to implementing load balancing by mechanisms such as mapping of a VLAN pool to one SSID.		
	Integration Required to locate a particular client in the campus based on its real time location using the Wireless Management software.		
	Every concurrent user should effectively get at least 20 Mbps bandwidth. The end user needs to ensure to be in a diameter of any AP on which it is latched to achieve the same till 30 feet of distance from AP.		

	Time-of-day availability of SSID		
	Must support AP enforced load-balance between 2.4Ghz and 5Ghz band. Incase end points are coming fro 802.11 a/b/g/ac/n, then they should get load balanced way of bandwidth.		
Authentication	The entire Wi-Fi network should be fully secure. In particular		
	Integration Required for Multiple authentication mechanisms should be implemented		
	Integration Required for Every user should get access to only those services for which they are authorized.		
	Integration Required for Rule-based access rights		
	Integration Required for Data communication between devices should take place in encrypted form to ensure end-to-end security of user information/ data.		
	Integration Required for Support in-line security standards WPA, WPA2		
QOS	**Integration Required** for System should provide QoS features given below		
	Traffic Prioritization for different application requirements		
	Support Type of Service marking and 802.11p priority tagging.		
	Support Wi-Fi Multi Media (WMM) based on 802.11e standard		
	Ability to limit per-user bandwidth rate.		
	Self-healing should be available from day 1.		
	Support per user, per device, and per application/TCPport Prioritization		
	Dynamic load balancing from day 1.		
	Adaptive RF management from day 1.		
	Support advanced multicast features with multicast rate optimization, multi channel use and IGMP snooping		
Facility Management	Bidder will arrange for atleast **1 Onsite Engineers**, for the period of 3 Years from the date of acceptance and for additional two years if University decides to enter into comprehensive AMC, to look after the facility management services related to Wired & Wi-Fi and Audio Visual facility. These services include		
	The delivery for all equipment's should be done in 4-6 weeks after the release of PO.		
	The entire project needs to be completed in 1 Months from supply of equipment.		
	All fiber laying work should be completed in 1 month		

	after the release of PO.		
	Providing connectivity to user devices as per existing Wi-Fi access policy		
	Passive Work		
	Bidder to ensure that there must be Professional workmanship done for any Passive work.		
	Every Cable needs to have a Tag from both ends so as to Identify the Cable and its purpose		
	Bidder to ensure that in 3 years onsite Maintenance Contract all change Managements will be Free of any Cost.		
	Bidder to ensure that all persons onsite must have hands on Wired & Wireless & Audio Visual Technologies Experience. Persons with BE/B Tech/BIT/Bsc IT/MCA/M.Tech/Msc IT or Diploma in IT will be preferred.		
DAM on 802.11 ac	**Denser amplitude modulation** – 128/256-QAM supported AP's on 802.11ac.		
MIMO	Multi-user MIMO – AP's should support simultaneous transmissions to multiple clients and maximizes RF band utilization. 3*3:3 streams is required. 4*4:3/4*4:4 streams will be preferred.		
Security	Wi-Fi access points (APs) must be configured to use cryptographic keys or other methods to ensure that only authenticated users can use the Wi-Fi service.		
	The Wi-Fi network should be secure and conform to the industry standard security requirement. SI shall deploy policies at various levels (i.e. on firewall, IDS/IPS, antivirus etc.) to prevent any attack/ intrusion in the Wi-Fi network.		
	There should be an encrypted tunnel between AP to existing installed Controller.		
	Meet all Security features as mentioned in existing Controller and existing AAA and Security Specifications		
Certifications	For all the quoted AP's the bidder should provide WPC license copy as per DOT, Govt Of India Regulation. Must have all necessary Health regulation certifications and to be shared with Jamia Hamdard.		

Maintenance	The SI shall provide preventive maintenance services for all the equipment at least once in every quarter. The preventive maintenance shall include - a) Check for any loose contacts in the cables & connections. b) Cleaning and removal of dust and dirt from the interior and exterior of the equipment etc.		
	The maintenance services involves comprehensive maintenance of all component covered under the contract, including repairing, replacement of parts, modules, sub-modules, assemblies, sub-assemblies, spares part, updating, security alerts and patch uploading etc. to make the system operational.		
	Provide comprehensive onsite warranty and maintenance with spare parts, system software/ firmware/ signature updates, patches etc. for all the IT infrastructure supplied and installed under this project and to maintain the required SLA for a period of 3 years from the date of commissioning.		
	Providing connectivity to user devices as per existing or required Wi-Fi access policy.		
Passive Work	Meet all specification as mentioned in Passive specifications.		
	Bidder to ensure that there must be Professional workmanship done for any Passive work.		
	Every Cable needs to have a Tag from both ends so as to Identify the Cable and its purpose		

ANNEXURE XV – Overall Location Wise BOQ

WIRED & WIRELESS CONNECTIVITY BILL OF MATERIAL FOR GROUND FLOOR CENTRAL LIBRARY

S.No.	JAMIA HAMDARD UNIVERSITY	INDOOR ACCESS POINT 802.11AC	WIRED LAN POINT	LAYER 3 24 PORTS ACCESS SWITCH	LAYER 3 PoE 24 PORTS ACCESS SWITCH	CAT 6 UTP CABLE	36 U 600 x 600 NETWORK RACK	24 PORTS UNLOADED JACK PANEL	CAT 6 INFORMATION OUTLET	SINGLE PORT FACE PLATE	QUAD PORTS FACE PLATE	SURFACE MOUNT BOX - SINGLE PORT	CAT 6 UTP 1 Mtr Patch Cord	CAT 6 UTP 3 Mtr Patch Cord	SINGLE MODE FIBRE CABLE (MTR.)	CISCO SINGLE MODE 10G SFP MODULE	LIU 6 PORT	SINGLE MODE FIBRE PATCH CORD	PVC CONDUIT 20 MM
1	**Faculty Room**																		
1.1	**Faculty Room 1**		8			400				8			8	8					120
1.2	**Faculty Room 2**		8			400				8			8	8					120
	Ground Floor	10	10	3	2	500	1	5	202			10	10		400	2	2	2	550
2	**Smart Class Rooms**													0					0
2.1	**Class Room 1**		4			200					4		4	4					60
2.2	**Class Room 2**		4			200					4		4	4					60
2.3	**Class Room 3**		4			200					4		4	4					60
2.4	**Class Room 4**		4			200					4		4	4					60
2.5	**Class Room 5**		4			200					4		4	4					60
2.6	**Class Room 6**		4			200					4		4	4					60
2.7	**Class Room 7**		4			200					4		4	4					60
2.8	**Class Room 8**		4			200					4		4	4					60
2.9	**Class Room 9**		4			200					4		4	4					60
2.10	**Class Room 10**		4			200					4		4	4					60
2.11	**Class Room 11**		4			200					4		4	4					60
2.12	**Class Room 12**		4			200					4		4	4					60
2.13	**Class Room 13**		4			200					4		4	4					60
2.14	**Class Room 14**		4			200					4		4	4					60
2.15	**Class Room 15**		4			200					4		4	4					60
2.16	**Class Room 16**		4			200					4		4	4					60
2.17	**Class Room 17**		4			200					4		4	4					60
2.18	**Class Room 18**		4			200					4		4	4					60
2.19	**Class Room 19**		4			200					4		4	4					60
3	**Conference Room**		4			200					4		4	4					60
GRAND TOTAL		**10**	**106**	**3**	**2**	**5300**	**1**	**5**	**202**	**16**	**80**	**10**	**106**	**96**	**400**	**2**	**2**	**2**	**1990**
		Nos	**Nos**	**Nos**	**Nos**	**Mtrs**	**Nos**	**Nos**	**Nos**	**Nos**	**Nos**	**Nos**	**Nos**	**Nos**	**Mtrs**	**Nos**	**Nos**	**Nos**	**Mtrs**

Signature of Bidder with Company Stamp

ANNEXURE XVI –FINANCIAL BID

FINANCIAL BID FORMAT

ACTIVE COMPONENTS

S.NO.	DESCRIPTION WITH MAKE AND MODEL	UoM	QTY	CURRENCY	UNIT RATE	TOTAL AMOUNT
A.1	Indoor Wireless Access Point 802.11ac with mounting kit and accessories.	Nos.	10			
A.2	Basic L3 Access Switch with 24 10/100/1000BASE-T IEEE 802.3af PoE / 802.3at PoE+ Ports; 2 * 10 G SFP Ports+ and 2 * 1 G SFP.	Nos.	2			
A.3	Basic L3 Access Switch with 24 10/100/1000BASE-T Ports; 2 * 10 G SFP Ports+ and 2 * 1 G SFP.	Nos.	3			
A.4	SFP 10 G LR Single Mode Upto 10 KM, (10 G SFP+ Fiber Module)	Nos.	4			
A.5	Video Conferencing Enpoint Type - I (As per specifications)	Nos.	1			
A.6	Video Conferencing Enpoint Type - II (As per specifications)	Nos.	2			
A.7	Video Conferencing Enpoint Type - III (As per specifications)	Nos.	1			
A.8	Warranty Support 24 x 7 for PoE Access Switch - 3 Years	Nos.	2			
A.9	Warranty Support 24 x 7 for Access Switch - 3 Years	Nos.	3			
A.10	Warranty Support 24 x 7 for Video Conferencing Type-I - 3 Years	Nos.	1			
A.11	Warranty Support 24 x 7 for Video Conferencing Type-II - 3 Years	Nos.	2			
A.12	Warranty Support 24 x 7 for Video Conferencing Type-III - 3 Years	Nos.	1			
A.13	Any Other Component / Equipment Required for functional of Wireless & Switch solution	Nos.				
					TOTAL FOR ACTIVE COMPONENTS (A)	

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FINANCIAL BID FORMAT
PASSIVE COMPONENTS (B)

S.No	Passive Components with Make and Model	UOM	Qty	Unit Rate (in Rs.)	Amount	Tax %	Tax Amount	Total Amount
B.1	42 U Network Rack 1000 x 1000 mm with 2 Fans with Fan Tray, 5 x Cable Manager, 2 x 12 Socket Vertical PDU, 5 x H/w Packet of 10 and should be complete with Castor wheels, Front & Rear Door with Lock & Key and all required accessories.	Nos.	1					
B.2	CAT 6 UTP Cable - roll of 305 mtrs	Nos.	18					
B.3	Unloaded 24 Ports Modular Jack Panel	Nos.	5					
B.4	CAT 6 Information Outlet	Nos.	212					
B.5	Surface Mount Box with Face Plate - Single Port	Nos.	10					
B.6	Face Plate - Single Port	Nos.	16					
B.7	Face Plate - Quad Port	Nos.	80					
B.8	CAT 6 UTP Patch Cord 1 mtr	Nos.	116					
B.9	CAT 6 UTP Patch Cord 3 mtr	Nos.	96					
B.10	6 Core Singlemode Fiber OS2: corrugated steel tape 6 core fibre cable 9/125 micron	Mtrs.	400					
B.11	12 Ports fibre optic drawer sliding type loaded with 12 LC adapters units for singlemode fibres, OS 2, 9/125 micron	Nos.	2					
B.12	LC - LC Singlemode 3 Mtrs Fibre Patch Cord	Nos.	4					
B.13	PVC Conduit 25mm with accessories	Mtrs.	1990					
TOTAL FOR PASSIVE COMPONENTS - (B)								

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FINANCIAL BID FORMAT

SERVICES & INSTALLATION COMPONENT (C)

S.No	Service Components	Qty	UOM	Unit Rate* (in Rs.)	Total Amount (in Rs.)	Service Tax- 14.5%	Total Amount (in Rs.) Including ST
D.1	Installation of Access Points (Indoor)	10	Nos.				
D.2	Installation & Configuration of Access Switch	5	Nos.				
D.3	Installation & Configuration of Video Conferencing Endpoints with Integration of VC Solution with Jamia Hamdard Centralized Unified Communication System as per requirement.	3	Nos.				
D.4	Laying of UTP Cable	5490	Mtrs.				
D.5	Pulling / Blowing of OFC in GI/Flexible GI/HDPE Pipe	400	Mtrs.				
D.6	Installation of 24 ports Jack panel	5	Nos.				
D.7	Installation of Information Oultlet	212	Nos.				
D.8	Termination of Information Outlet	212	Nos.				
D.9	Installation of Surface Mount Box	106	Nos.				
D.10	Installation of LIU	2	Nos.				
D.11	Installation of Rack	1	Nos.				
D.12	Labeling of Jack Panels with Printed labels	5	Nos.				
D.13	Labeling of patch cords with Printed Labels	116	Nos.				
D.14	Fiber Splicing per core	24	Nos.				
D.15	Laying of PVC Conduit Pipe	1990	Mtrs.				
D.16	Resident Engineer - Monday to Friday from 9:00 AM to 6 PM Per Engineer on Yearly basis.	1	Nos.				
D.17	Project Management Charges	1	Nos.				
D.18	Any other Service, necessary of completion & successful implementation of the Project		Nos.				
						TOTAL INSTALLATION COST - (C)	
						GRAND TOTAL (PASSIVE + INSTALLATION COST) (B + C)	

Total Amount in words for Passive & Services Components (Indian Rupees) : _____

_____

Total Amount in words for Active Components in USD $: _____

_____

Signature of Bidder with Company Stamp

Bidders Contact Details with Complete Address: