Standard Bidding Document
for
Procurement of ICT Equipment

Procuring Agency: **Samtse College of Education**, Samtse

PACKAGE II

Ref: 37/SCE-Quot/2020-2021/004

15th September 2020

The General Manager
Advertisement Department
Kuensel Cooperation
Thimphu.

Sub: *Request to publish an announcement*

Sir/Madam,

The undersigned would like to request your office to kindly publish the following notice inviting tender in your newspaper dated 16th &17th September 2020 and arrange to send the bill for payment as per our existing practice:

SAMTSE COLLEGE OF EDUCATION
NOTICE INVITING TENDER

Samtse College of Education is pleased to invite sealed tender from the eligible license holders for the supply and services of the following items:

1. Package I – Running of College Canteen
2. Package II – Supply of ICT Equipment

The bidding documents can be downloaded from our website at http://www.sce.edu.bt. The last date for submission of tender is 29th October 2020 at 2:30 PM and opened on the same day at 3:00 PM

For any inquiry, please contact Administrative Officer at 05-365274 during office hours.

Yours sincerely,

(Rinchen Dorji, PhD)
PRESIDENT

Copy to:
1. Accounts Section for information
2. Store Incharge for information
3. Office copy

1. The bidder(s) may quote for any or all items under this invitation. Each item shall be evaluated and contract awarded separately to the firm(s) offering the lowest evaluated price for each item

2. The bidder(s) shall submit one original of the priced quotation with the Form of Bid and clearly marked ORIGINAL. In addition, the bidder(s) should also submit one copy marked as COPY. The quotation including all documents in the attached format should be sealed in an envelope and addressed to and delivered at the following address.

    The
    Administrative Officer
    Samtse College of Education (Samtse)
    05-365274
    ttshering.sce@rub.edu.bt

3. The deadline for receipt of your quotation(s) by the purchaser at the indicated address is **28th September, 2020**.

4. The quotation should be submitted latest by **28 September 2020 on or before 1230 hours** and will be opened on **the same day at 2:00PM.**

5. The bid shall be accompanied by a bid security of **Nu. 20,000.00 (Twenty Thousand)** Favour of Samtse College of Education, Samtse, in the form of cash warrant, demand draft or unconditional Bank Guarantee valid till **27th December, 2020**. Any bid not accompanied by bid security shall be treated as non responsive.

6. Quotation by fax or by electronic means **are not** acceptable.

7. The quotation should be submitted as per the following instructions and in accordance with the attached Contract. The attached Terms and Conditions of Supply is an integral part of the Contract.

    a) PRICE: all prices shall be quoted in Ngultrum. The quoted price shall be inclusive of all related costs including taxes, duties and other levies to the final place of delivery. The final place of delivery is Samtse College of Education, Samtse and real.

    b) EVALUATION OF QUOTATION: offers determined to be substantially responsive to the technical specifications will be evaluated by comparison of their quoted prices. In evaluating the quotations, the purchaser will determine for each

quotation the evaluated price by adjusting the priced quotation by making any correction for any arithmetical errors as follows;

    (i) where there is a discrepancy between amounts in figures and in words, the amount in words will govern;

    (ii) where there is discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted shall govern unless in the opinion of the Employer there is an obviously gross misplacement of the decimal point in the unit rate, in which case the line item total as quoted shall govern, and the unit rate shall be corrected.

    (iii) if the supplier refuses to accept the correction, this quotation will be rejected and the bid security shall be forfeited.

c) AWARD OF PURCHASE ORDER: the award will be made to the bidder who is offering the lowest evaluated price that meets the specifications. The successful bidder will sign a contract as per attached form of contract and terms and conditions of supply.

d) VALIDITY OF THE OFFERS: your quotation(s) shall be valid for a period of **60 days** from the deadline for receipt of quotation(s).

8. Depending on the final requirement, the purchaser may increase or decrease the quantities by fifteen percent (15%) of the purchase order.

9. The quotation(s) will be opened in the presence of bidders or their representatives who choose to attend at the specified venue and time.

10. The Purchaser is not bound to accept the lowest bid and reserves the right to accept or reject any or all the bids without assigning any reason whatsoever.

11. The bidder whose bid 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).

12. Normal commercial warranty/guarantee shall be applicable to the supplied goods.

13. The ten (10) percent performance security shall be retained as security deposit and paid at the end of the warranty period or after six (6) months whichever is later after adjustment of dues if any.

Enclosed as Annexure   -   Schedule of Items and Price

Documents required to be submitted as part of the Quotation

The original and *copy (ies)* of quotation submitted by the supplier shall comprise the following:

     (a)   A duly completed and signed priced quotation as per the Schedule of Items and the Priced Quotation.

     (b)   A valid Trade License;

     (c)   A valid Tax Clearance Certificate;

     (d)   The required bid security

     (e)   Technical Specification of the Goods to be supplied; and

     (f)   Any other requirements specified in this document

Terms and Conditions for the Supply of Goods and Payment.

The Terms and Conditions hereinafter may only be varied with the written agreement of the Purchaser and no terms and conditions put forward at any time by the Supplier shall form any part of the Contract.

1. The Supplier shall be required to submit a performance security of 10% of the quoted price in the form of cash warrant, demand draft or unconditional Bank Guarantee issued by a financial institution located in Bhutan, which shall be furnished upon signing the contract. Performance security shall be valid till the end of warranty period and will be returned after the end of warranty period.

2. The supply of the goods shall be completed within *[60]* days from the date of issue of the Purchase Order.

3. Payment of the Invoice shall be arranged by the Purchaser, within thirty (30) days upon submission of original Invoice and TPN number, against the actual supplied quantities of goods as listed in the Purchase Order.

4. The quoted price shall include all taxes, duties, insurance and any other costs involved and nothing extra shall be paid.

5. Any goods found defective during the warranty period shall be replaced/repaired by the supplier at his cost. If the supplier fails to rectify and or replace the defective goods, the purchaser shall do it at the cost of the supplier.

6. The supplier shall pay liquidated damages at the rate of 0.1% per day for each day of delay to a maximum of 10% of the quoted price.

7. The Purchaser may, by written notice, terminate the Purchase Order (or Contract if applicable) in whole or in part at any time for its convenience:

a. if the Supplier fails to perform any other Terms and conditions specified with the Purchase Order, or exceeds the maximum amount of liquidated damages.

b. if the Supplier fails to perform any other obligation(s) under the Purchase Order, or

c. if the Supplier does not take any remedial action within a period of (7) seven calendar days after receipt of a notice of default from the Purchaser specifying the nature of the default(s), or

d. if the Supplier, in the judgment of the Purchaser, has engaged in any corrupt or fraudulent practices in competing for or in executing the tasks under this Purchase Order; and

8. The Supplier shall provide the warranty, as stipulated in the Quotation document, for the goods to be supplied and confirm that if any faults are detected within the warranty period in the supplied/installed goods, the Supplier shall be bound to rectify the fault or replace the goods as the case may be. The security deposit shall be used to cover the cost of supplies not delivered or defective items not replaced or rectified.

9. The purchaser may procure any of the items from the open market in case the supplier fails to supply the goods within the stipulated time and realise the difference amount between the quoted price & market price from the security deposit.

Contract Agreement

[The successful Bidder shall fill in this form in accordance with the instructions indicated]

THIS CONTRACT AGREEMENT made the *[insert number]* day of *[insert month]*, *[insert year]*,

BETWEEN

    (1)   *[insert complete name of Purchaser]*, a *[insert description of type of legal entity, for example, an agency of the Ministry of .... of the Government of Bhutan, or corporation incorporated under the laws of Bhutan]* and having its principal place of business at *[insert address of Purchaser]* (hereinafter called "the Purchaser"), and

    (2)   *[insert name of Supplier]*, a corporation incorporated under the laws of *[insert: country of Supplier]* and having its principal place of business at *[insert: address of Supplier]* (hereinafter called "the Supplier").

WHEREAS the Purchaser invited Bids for certain Goods and ancillary services, viz., *[insert brief description of Goods and Services]* and has accepted a Bid by the Supplier for the supply of those Goods and Services in the sum of *[insert Contract Price in words and figures, expressed in the Contract currency/ies]* (hereinafter called "the Contract Price").

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

1.   In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract referred to.

2.   The following documents shall constitute the Contract between the Purchaser and the Supplier, and each shall be read and construed as an integral part of the Contract, viz.:

    (a)   This Contract Agreement;
    (b)   Terms and Conditions;
    (c)   Technical Requirements (including Schedule of Supply and Technical Specifications);
    (e)   The Supplier's Bid and original Price Schedules;
    (f)   The Purchaser's Notification of Award of Contract;
    (g)   The form of Performance Security;
    (h)   The form of Bank Guarantee for Advance Payment;
    (i)   *[insert here any other document(s) forming part of the Contract]*

3.   This Contract shall prevail over all other Contract documents. In the event of any discrepancy or inconsistency within the Contract documents, then the documents shall prevail in the order listed above.

4.	In consideration of the payments to be made by the Purchaser to the Supplier as hereinafter mentioned, the Supplier hereby covenants with the Purchaser to provide the Goods and Services and to remedy defects therein in conformity in all respects with the provisions of the Contract.

5.	The Purchaser hereby covenants to pay the Supplier in consideration of the provision of the Goods and Related Services and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of Bhutan on the day, month and year indicated above.

For and on behalf of the Purchaser

Signed: *[insert signature]*
in the capacity of *[insert title or other appropriate designation]*

in the presence of *[insert signature]*
[insert identification of official witness]

For and on behalf of the Supplier

Signed: *[insert signature of authorized representative(s) of the Supplier]*
in the capacity of *[insert title or other appropriate designation]*

in the presence of *[insert signature]*
[insert identification of official witness]

Performance Security

[The bank, as requested by the successful Bidder, shall fill in this form in accordance with the instructions indicated]

Date: *[insert date (as day, month, and year) of Bid submission]*
IFB No. and title*: [insert no. and title of bidding process]*

Bank's Branch or Office: *[insert complete name of Guarantor]*

Beneficiary: *[insert complete name of Purchaser]*

PERFORMANCE GUARANTEE No.:   *[insert Performance Guarantee number]*

We have been informed that *[insert complete name of Supplier]* (hereinafter called "the Supplier") has entered into Contract No. *[insert number]* dated *[insert day and month], [insert year]* with you, for the supply of *[description of Goods and related Services]* (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a Performance Guarantee is required.

At the request of the Supplier, we hereby irrevocably undertake to pay you any sum(s) not exceeding *[insert amount(s) in figures and words]* upon receipt by us of your first demand in writing declaring the Supplier to be in default under the Contract, without cavil or argument, or you needing to prove or to show grounds or reasons for your demand or the sum specified therein.

This Guarantee shall expire no later than the *[insert number]* day of *[insert month] [insert year]*, and any demand for payment under it must be received by us at this office on or before that date. We agree to a one-time extension of this Guarantee for a period not to exceed *[six months] [one year]*, in response to the Purchaser's written request for such extension, such request to be presented to us before the expiry of the Guarantee.

[signatures of authorized representatives of the bank and the Supplier]

Bank Guarantee for Advance Payment

[The bank, as requested by the successful Bidder, shall fill in this form in accordance with the instructions indicated.]

Date: *[insert date (as day, month, and year) of Bid submission]*
IFB No. and title: *[insert number and title of bidding process]*

[bank's letterhead]

Beneficiary: *[insert legal name and address of Purchaser]*

ADVANCE PAYMENT GUARANTEE No.: *[insert Advance Payment Guarantee no.]*

We, *[insert legal name and address of bank],* have been informed that *[insert complete name and address of Supplier]* (hereinafter called "the Supplier") has entered into Contract No. *[insert number]* dated *[insert date of Contract]* with you, for the supply of *[insert types of Goods to be delivered]* (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, an advance payment is to be made against an advance payment guarantee.

At the request of the Supplier, we hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of *[insert amount(s) in figures and words]* upon receipt by us of your first demand in writing declaring that the Supplier is in breach of its obligation under the Contract because the Supplier used the advance payment for purposes other than toward delivery of the Goods.

It is a condition for any claim and payment under this Guarantee to be made that the advance payment referred to above must have been received by the Supplier in its account *[insert number and domicile of the account]*

This Guarantee shall remain valid and in full effect from the date of the advance payment received by the Supplier under the Contract until *[insert date[1]].* We agree to a one-time extension of this Guarantee for a period not to exceed *[six months][one year]*, in response to the Purchaser's written request for such extension, such request to be presented to us before the expiry of the Guarantee.

_____

[signature(s) of authorized representative(s) of the bank]

Sl#	Motorized LCD Projector Screen for Auditorium (wit	Brand and Model No.	Rate	Remarks
1	18ft x 12ft Motorized Super Deluxe quality widescreen without joints with aspect ratio of 16:10, Matte White German Fabric			
Sl#	Ultra Shortthrow Projector (Epson EB695WI or Equi	Brand and Model No.	Rate	Remarks
2	• Color Light Output :3,500 Lumen- 2,900 Lumen (economy) In accordance with ISO 21118:2013 • White Light Output: 3,500 Lumen - 2,900 Lumen (economy) In accordance with ISO 21118:2013 • Resolution: WXGA, 1280 x 800, 16:10 • High Definition: HD ready • Aspect Ratio: 16:10 • Contrast Ratio: 14,000 : 1 • Light source: Lamp • Lamp: 250 W, 5,000 h durability, 10,000 h durability (economy mode), 9,000 h durability (economy mode) • Keystone Correction : Manual vertical: ± 3 °, Manual horizontal ± 3 ° • Colour Video Processing: 10 Bits • 2D Vertical Refresh Rate: 100 Hz - 120 Hz • Colour Reproduction: Upto 1.07 billion colours • USB Display Function: 3 in 1: Image / Mouse / Sound • Throw Ratio: 0.28 - 0.37: • Zoom: Digital, Factor: 1 - 1.35 • Lens: Optical • Screen Size: 60 inches - 100 inches • Projection Distance Wide: 0.4 m (60 inch screen) • Projection Distance Tele: 0.6 m (100 inch screen) • Projection Lens F Number: 1.6 • Projection Lens Focal Length: 3.7 mm • Projection Lens Focus: Manual:			
Sl#	LCP Projector (Epson EB S03 or Equivalent)	rand and Model N	Rate	Remarks

3	• Display Type: LCD • Light Output: 2700 Lumens • Warranty: 2 Year(s) • Features: Convenient Connection to a Document Camera, Direct Display from USB, Eco Friendly, HDMI Connectivity, High Contrast Ratio, Horizontal Keystone Adjuster, IR Receivers, Wireless Transmission • Audio: Mono • Life of Lamp - Full Usage: 5000 Hours • Life of Lamp - Eco Usage: 6000 Hours • Screen Coverage: 30-350 Inches • Contrast Ratio: 10000:1 • Throw Ratio: 1.45-1.96 • Resolution: SVGA(800x600) • Audio Output: 1 Watts • Projector Lens: No Optical Zoom-Focus Manual			
Sl#	**Epson ELPAP10 Wireless Dongle**	**Brand and Model No**	**Rate**	**Remarks**
4	This high-speed, wireless network adapter plugs directly into select Epson projectors allowing quick and easy access to the LAN or peer-to-peer networks without wires or cables. When used with Epson EasyMP Monitor and Network Projection software, users can remotely access and control projectors over the wireless LAN. • Compliant with 802.11 b/g/n standards • Uses USB type A connector • Compatible with PC or Mac • Able to transmit audio • Model: V12H731P02			
Sl#	**Workstation Desktop**	**Brand and Model No.**	**Rate**	**Remarks**

Sl#		Brand and Model No.	Rate	Remarks

5	• Processor: 2 x Intel® Xeon® Gold 6234 (3.30GHz, up to 4.00GHz with Turbo Boost, 8 Cores, 25MB Cache)
	• Chipset: Intel® C621
	• Operating System: Windows OS
	• Memory: 64GB DDR4 2933MHz ECC
	• RDIMM (8 X 8GB)
	• Graphics: 2 x NVIDIA Quadro RTX 6000
	• Min. 8GB with NVLink
	• Hard Drive: 2.5" SATA SSD 2TB
	• Network Card: 2 X 1GbE RJ45
	• Keyboard: USB Traditional QWERTY Keyboard
	• Pointing Device: USB Optical Mouse
	• Monitor: Brightness : 350 nits
	          Contrast Ratio : 1000:1
	          Maximum Resolution : 2560 X 1440
	          Aspect Ratio : 16:9
	          Display size : 27"
	          Warranty: Minimum of 1 year product warranty			

Sl#	Workstation Desktop	Brand and Model No.	Rate	Remarks

6	• Processor: 9th Gen Intel® Core™ i5 9400 (6-Core, 9MB Cache, up to 4.1GHz with Intel® Turbo Boost Technology)
	• Chipset: Intel® Core™ i5 9400
	• Operating System: Windows 10 Home 64bit English
	• Memory: 8GB DDR4 at 2666MHz
	• Graphics: Intel UHD Graphics 630 with shared graphics memory
	• Hard Drive: 500GB/1TB 7200RPM SATA 6Gb/s
	• Network Card: 2 X 1GbE RJ45
	• Keyboard: USB Keyboard
	• Pointing Device: USB Optical Mouse
	
	• Monitor:
	          Brightness : 350 nits
	          Contrast Ratio : 1000:1
	          Maximum Resolution : 2560 X 1440
	          Aspect Ratio : 16:9			

Sl#	SFP Module	Brand and Model No	Rate	Remarks

	Up to 1.25Gb/s bi-directional data links • Hot-pluggable SFP footprint • Extended case temperature range (0°C to +85°C) • Fully metallic enclosure for low EMI • Low power dissipation (1.05 W typical) • Compact RJ-45 connector assembly • RoHS compliant and Lead Free • Access to physical layer IC via 2-wire serial bus • 10/100/1000 BASE-T operation in host systems with SGMII interface Applications • 1.25 Gigabit Ethernet over Cat 6 cable			
7				
Sl#	**Fiber patch code**	**Brand and Model No.**	**Rate**	**Remarks**
8	Single mode, 3M SC-to-LC			
Sl#	**Fiber Patch panel (LIU Loaded)**	**Brand and Model No.**	**Rate**	**Remarks**
9	12 ports 24 ports 48 port			
Sl#	**Switch rack**	**Brand and Model No.**	**Rate**	**Remarks**
10	Switch rack U9			
Sl#	**UTP cable**	**Brand and Model No.**	**Rate**	**Remarks**
11	Cat6e outdoor			
	Cat6e indoor			
Sl#	**Fiber pigtail**	**Brand and Model No.**	**Rate**	**Remarks**
12	Fiber pigtail: Single Mode			
Sl#	**R45 Connectors**	**Brand and Model No.**	**Rate**	**Remarks**
13	R45 Connectors			
Sl#	**Media Converter**	**Brand and Model No.**	**Rate**	**Remarks**

14	• 10/100/1000 LC Single mode Media Converter • 10/100/1000 UTP to Singlemode Fiber converter • Up to 550 Meters (1800ft) range • Auto-detects Full / Half Duplex Transfer Mode • Auto Negotiation MDI / MDI-X • 6 performance monitoring LEDs • 850nm wavelength Small, compact design • AC Adapter Input: 100-240V, 50/60Hz; Output: 5V, 1.2AMP • Cable Type Multimode • Connector A RJ45 (FEMALE • Connector B SC DUPLEX (FEMALE) • Product Warranty Period (Worldwide) 1-year limited warranty			

Sl#	Fiber Optic Distribution Box	Brand and Model No.	Rate	Remarks
15	48 Core Fiber Optic Junction Box, Wall-mounted, wet-proof and water-proof			
Sl#	Optical Fiber Fusion Splicer	Brand	Rate	Remarks

Sl#		Brand and Model No.	Rate	Remarks
16	• Technical Specification: • Number of fiber: Single • Compatible Fiber/Cable • SM(ITU-T G.652&G.657) / MM(ITU-T G.651)/ DS(ITU-T G.653) /NZDS(ITU-T G.655) • Cleaved Length • Diameter: 0.125 ~1mm/Cleave Length 5~16mm • Typical Splice Loss • SM: 0.03dB/MM: 0.02dB/DS: 0.05dB/NZDS: 0.05dB/ G.657:0.03dB(ITU-T Standard) • Return Loss: >>60dB • Lighting: 3 LEDs • Splicing Time Quick mode : 7sec/ Auto mode:9sec • Estimated Splice Loss: Available • Heating Time FP-03 typical heating time: 13 Sec • Results Storage The last 10,000 results with image storage • Tension Test 1.96~2.25N • Operating Condition Operating Altitude: 0~5000m above sea level, 0~95% relative humidity, -10~50C, Max Wind 15m/s • Storage Condition 0~95% relative humidity, -40~80C • Display 90° bi-directional view, 5.0" Color High Resolution display • Fiber view & Magnification X, Y, XY, X/Y : 520X			

Sl#	Inverter:	Brand and Model No.	Rate	Remarks
17	Eaton E Series DX			

Sl#	PVC Card Printer transferable flim and dye	Brand and Model No.	Rate	Remarks
18	YMCK Dye Film 1000 images Prima 8 (Part no. PRIMA832 Re-transfer film 1000 images (Part no. Prima436			

Sl#	Wireless APs Indoor Dual Band	Brand and Model No.	Rate	Remarks

Sl#		Brand and Model No	Rate	Remarks
19	• Long Range Indoor Scalable WiFi Access Point • (Ubiquiti UniFi UAP or Equivalent) • Frequency - 2.4 GHz • PoE Enabled • 802.11n MIMO • Simultaneous Dual-Band Operation • 5 GHz Band with Speeds of up to 867 Mbps • 2.4 GHz Band with Speeds of up to 450 Mbps • Range up to 183 meters (600 feet) • Virtual Ubiquiti Controller software interface • Highly intuitive setup and configuration with many powerful features • Scalable to hundreds of devices while maintaining a single unified management system			

Sl#	Outdoor Wifi APs - Dual Band, 300Mbps 13dBi Outdo	Brand and Model N	Rate	Remarks
20	General · Dimensions 205 x 83 x 37 mm · Weight 250 g (without Antennas) 294 g (with Antennas) · Networking Interface (2) 10/100 Ethernet Ports · Buttons: Reset · Antennas: (2) External 5 dBi Omni Antennas Included, 191 mm (Length), 13 mm (Diameter) · Wi-Fi Standards 802.11 b/g/n · Power Method: Passive Power over Ethernet (48V), 802.3af Supported · Power Supply: 48V, 0.5A PoE Adapter (Included) · Maximum Power Consumption: 8 W · 2.4 GHz and 5 GHz Maximum TX Power - 28 dBm · BSSID Up to Four Per Radio · Power Save Supported · Wireless Security WEP, WPA-PSK, WPA-TKIP, WPA2 AES, 802.11i · Certifications CE, FCC, IC · Mounting Wall/Ceiling (Kits Included) · Operating Temperature -30 to 65 °C · Operating Humidity 5 - 95% Non-Condensing Advanced Traffic Management · VLAN 802.1Q · Advanced QoS Per-User Rate Limiting · Guest Traffic Isolation Supported			

Sl#		Brand and Model No.	Rate	Remarks
	· WMM Voice, Video, Best Effort, and Background · Concurrent Clients 100+ Supported Data Rates (Mbps) · 802.11n - 6.5 Mbps to 300 Mbps (MCS0 -			

Sl#	Antivirus Server Edition	Brand and Model No.	Rate	Remarks
21	Antivirus Server Edition for 100 users			

Sl#	LCD Projector LAMP	Brand and Model No.	Rate	Remarks
1	SP-LAMP-060 (InFocus IN102)			
2	SP-LAMP-069 (InFocus IN112)			
3	ELPLP88 / V13H010L88 (EPSON-EB-S31)			
4	SP-LAMP-091 (InFocus IN220i)			
5	SP-LAMP-089 (InFocus IN224i)			

Sl#	Distribution Switch: 24-Port L3 Managed Switch Specification	Brand and Model No.	Rate	Remarks
A	**Architecture and Port Density**			
1	24x 1Gig SFP ports plus 4x 1/10Gig SFP+ ports supporting 1/10Gig Fibre Modules from day 1.			
2	The Switch should be of non-blocking architecture for all ports and should support wirespeed multicasting on all ports.			
3	Should have dual internal redundant power supply from Day 1.			
4	Switches should support Active – Active Clustering using VSS or equivalent technology. The proposed VSS or equivalent technology should support high availability for both Layer 2 and Layer 3 (RIP, RIPng, OSPF, OSPF v3) including for IP Multicasting (PIM v4,PIM v6) for CCTV video and VoIP applications.			
5	Should support Long Distance Stacking enabling stack members to be placed at different locations.			
B	**Performance Specifications**			
1	Should support min of 40Gbps of stacking bandwidth per switch			
2	Should have min of 128Gbps of switching capacity			
3	Should have min of 95Mpps of Forwarding Rate			
4	Latency per port should not be more than 4 micro seconds for 1G porrts and 3 micro seconds for 10G ports. This latency repor should be furnished with the compliance/datasheet.			
5	Should have min of 512MB RAM and 64MB Flash Memory			
6	Should support min 16K MAC Address Table.			
7	Should support for 13K Jumbo frame			
8	Should support both IPv4 and IPv6			
C	**Resiliency**			

1	Switch should allow connecting several switches in Ring Topology with advanced Ring Protection and recovery/convergence time of less than 50ms			
2	Should have inbuilt Loop Detection and Loop Protection feature			
3	Should have Control Plane Prioritization (CPP) to ensure that the CPU always get sufficient bandwidth to process network control traffic			
4	Should support RSTP , MSTP			
D	**VLAN and Routing Support**			
1	Should support protocol and port based VLAN creation and classification from day 1			
2	Should support Generic VLAN Registration Protocol (GVRP) or equivalent from day 1			
3	Should support Static Routing and inter VLAN routing from Day 1			
4	Should support dynamic assignment of VLANs to end points from day 1			
5	Should support IEEE 802.1Q Virtual LAN (VLAN) bridges			
6	Should support IEEE 802.3ac VLAN tagging			
7	Should support RIP, OSPF, OSPFv3, PIMv4, PIMv6 with additional featured license.			
E	**Switch should have following Diagnostic Tools to troubleshoot network issues**			
1	Optical Digital Diagnostic Monitoring that allows real time monitoring of various parameter of optical transceiver			
2	Active Fibre Monitoring that detects tampering on optical links			
3	Port Mirroring (SPAN & RSPAN) that allows traffic from a port on local and remote switch to be analysed locally.			

4	Should allow to create and execute user-defined scripts upon selected system events and/or allow scheduling of execution of scripts based on Date, Day, Time and Event. This feature shall be used especially to schedule disabling of certain ports (e.g. uplinks to hostels, residence, etc) during office hours and enabling the same during off hours.			
6	Should support bandwidth limiting per port or per traffic class			
F	**Security**			
1	Should support IEEE 802.1x and EAP protocol			
2	Should support Dynamic & Private VLANs , Authentication-Fail and Guest VLANs to enforce security policies to end points.			
3	Should have Network Access Control (NAC) features or equivalent to manage end point security.			
4	BPDU Protection and STP Root Guard, Access Control List based on Layer 3 and layer 4, Dynamic VLAN			
5	Should support RADIUS, TACACS + and RADIUS accounting			
6	Should support MAC address filtering and MAC limiting / MAC Lock down functionality.			
7	Should support detection of Denial of Service (DoS) attack.			
8	Should support Tri-authentication: MAC-based, IEEE 802.1x Port based and Web-based			
9	Should Support SSH , SSLv2 ,SSLv3			
G	**Management**			
1	GUI, Telnet, Industry-standard CLI with built-in Help-menu			
2	Should support centralized management via SDN or equivalent technology.			
3	Should support storing and backing up of firmware and configuration to central server for easy restore and recovery.			

4	The switch should be able to search and locate its previous functional firmware and configuration and reload and reconfigure itself automatically.			
I	**Warranty** **The vendor should provide minimum of 3 years hardware replacement warranty. This warranty should be clearly mentioned in the Manufacturer's Authorization Letter issued by respective OEM on OEM letterhead.**			

Sl#	Edge Switch: L2 Managed Switch Specification	Brand and Model No.	Rate	Remarks
A	**Architecture and Port Density**			
1	Type-1: 8x 10/100/1000BaseT and 2x 1Gig SFP ports Type-2: 16x 10/100/1000BaseT and 2x 1Gig SFP ports Type-3: 24x 10/100/1000BaseT and 4x 1Gig SFP ports			
2	The Switch should be of non-blocking architecture for all ports.			
3	The Access Switch should be SDN enabled from day 1.			
B	**Performance Specifications**			
2	Switching Capacity: For Type-1: Min of 20Gbps. For Type-2: Min of 36Gbps. For Type-3: Min of 56Gbps.			
5	Should support min 16K MAC Address Table.			
6	Should support for 10K Jumbo frame			
7	Should support both IPv4 and IPv6			
8	Latency per port should not be more than 5 micro seconds for 1G. The latency report should be furnished with the compliance/datasheet.			
C	**Resiliency**			
1	Switch should support Rapid Ring Protection / Resiliency technology with recovery/convergence time of less than 50ms			
2	Should have inbuilt Loop Detection and Loop Protection feature			
3	Should have Control Plane Prioritization (CPP) to ensure the CPU always gets sufficient bandwidth to process network control traffic			
4	Should support RSTP , MSTP			
D	**VLAN support**			
1	Should support protocol and port based VLAN creation and classification			
2	Should support IEEE 802.1Q Virtual LAN (VLAN) bridges			
3	Should support IEEE 802.3ac VLAN tagging			
4	Should support LLDP-MED for Voice over IP implementation.			

5	Should support dynamic assignment of VLANs to end points.
E	**Switch should have following Diagnostic Tools to troubleshoot network issues**
1	Optical Digital Diagnostic Monitoring allows real time monitoring of various parameter of optical transceiver
2	Active Fibre Monitoring detects tampering on optical links
3	Cable Fault Locator detects fault in UTP cable connected on the switch ports. It should provide basic data like Open, Short, Wire Map and Cable Length.
4	Port Mirroring (SPAN & RSPAN) allows traffic from a port on local and remote switch to be analysed locally.
5	Should support MAC address filtering and MAC limiting / MAC Lock down functionality.
6	Should support bandwidth limiting per port or per traffic class
7	Should allow to create and execute user-defined scripts upon selected system events and/or allow scheduling of execution of scripts based on Date, Day, Time and Event.
F	**Security**
1	Should support IEEE 802.1x and EAP protocol
2	Should support IEEE 802.1x Port based authentication, Web Authentication (to enable guest access) and MAC Authentication (to support end points that do not have 802.1x supplicant). Should allow to enable all three types of authentication simultaneously on all ports.
3	Should support Dynamic & Private VLANs , Authentication-Fail and Guest VLANs to enforce security policies to end points.
4	Should have Network Access Control (NAC) features or equivalent to manage end point security.
5	BPDU Protection and STP Root Guard, Access Control List based on Layer 3 and layer 4, Dynamic VLAN
6	Should support RADIUS, TACACS + and RADIUS accounting
7	Should support MAC address filtering and MAC limiting / MAC Lock down functionality.

8	Should support detection of Denial of Service (DoS) attack.			
9	Should Support SSH , SSLv2 ,SSLv3			
G	**Management**			
1	GUI, Telnet, Industry-standard CLI with built-in Help-menu			
2	Should support centralized management via SDN or equivalent technology.			
3	Should support storing and backing up of firmware and configuration to central server for easy restore and recovery.			
4	The switch should be able to search and locate its previous functional firmware and configuration and reload and reconfigure itself automatically.			
H	**Warranty** **The vendor should provide minimum of 3 years hardware replacement warranty. This warranty should be clearly mentioned in the Manufacturer's Authorization Letter issued by respective OEM on OEM letterhead.**			

Sl#	Edge Switch: L2 Managed PoE+ Switch Specification	Brand and Model No.	Rate	Remarks
A	**Architecture and Port Density**			
1	Type-1: 8x 10/100/1000BaseT PoE+ and 2x 1Gig SFP ports Type-2: 16x 10/100/1000BaseT PoE+ and 2x 1Gig SFP ports Type-3: 24x 10/100/1000BaseT PoE+ and 4x 1Gig SFP ports			
2	All ports should be PoE+ enabled supporting upto 30Watts of PoE output			
3	PoE Budget: For Type-1 Switch: Min of 124W For Type-2 Switch: Min of 274W For Type-3 Switch: Min of 370W			
4	The Switch should be of non-blocking architecture for all ports.			
5	The Access Switch should be SDN enabled from day 1.			
B	**Performance Specifications**			
2	Switching Capacity: For Type-1: Min of 20Gbps. For Type-2: Min of 36Gbps. For Type-3: Min of 56Gbps.			
5	Should support min 16K MAC Address Table.			
6	Should support for 10K Jumbo frame			
7	Should support both IPv4 and IPv6			
8	Latency per port should not be more than 5 micro seconds for 1G ports. The latency report should be furnished with the compliance/datasheet.			
C	**Resiliency**			
1	Switch should support Rapid Ring Protection / Resiliency technology with recovery/convergence time of less than 50ms			
2	Should have inbuilt Loop Detection and Loop Protection feature			

3	Should have Control Plane Prioritization (CPP) to ensure the CPU always has sufficient bandwidth to process network control traffic			
4	Should support RSTP , MSTP			
D	**VLAN support**			
1	Should support protocol and port based VLAN creation and classification			
2	Should support IEEE 802.1Q Virtual LAN (VLAN) bridges			
3	Should support IEEE 802.3ac VLAN tagging			
4	Should support LLDP-MED for Voice over IP implementation.			
5	Should support dynamic assignment of VLANs to end points.			
E	**Switch should have following Diagnostic Tools to troubleshoot network issues**			
1	Optical Digital Diagnostic Monitoring that allows real time monitoring of various parameter of optical transceiver			
2	Active Fibre Monitoring that detects tampering on optical links			
3	Cable Fault Locator that detects fault in UTP cable connected on the switch ports. It should provide basic data like Open, Short, Wire Map and Cable Length.			
4	Port Mirroring (SPAN & RSPAN) that allows traffic from a port on local and remote switch to be analysed locally.			
5	Should support MAC address filtering and MAC limiting / MAC Lock down functionality.			
6	Should support bandwidth limiting per port or per traffic class			
7	Should allow to create and execute user-defined scripts upon selected system events and/or allow scheduling of execution of scripts based on Date, Day, Time and Event.			
F	**Security**			
1	Should support IEEE 802.1x and EAP protocol			

2	Should support IEEE 802.1x Port based authentication, Web Authentication (to enable guest access) and MAC Authentication (to support end points that do not have 802.1x supplicant). Should allow to enable all three types of authentication simultaneously on all ports.			
3	Should support Dynamic & Private VLANs , Authentication-Fail and Guest VLANs to enforce security policies to end points.			
4	Should have Network Access Control (NAC) features or equivalent to manage end point security.			
5	BPDU Protection and STP Root Guard, Access Control List based on Layer 3 and layer 4, Dynamic VLAN			
6	Should support RADIUS, TACACS + and RADIUS accounting			
7	Should support MAC address filtering and MAC limiting / MAC Lock down functionality.			
8	Should support detection of Denial of Service (DoS) attack.			
9	Should support Tri-authentication: MAC-based, IEEE 802.1x Port based and Web-based			
10	Should Support SSH , SSLv2 ,SSLv3			
G	**Management**			
1	GUI, Telnet, Industry-standard CLI with built-in Help-menu			
2	Should support centralized management via SDN or equivalent technology.			
3	Should support storing and backing up of firmware and configuration to central server for easy restore and recovery.			
4	The switch should be able to search and locate its previous functional firmware and configuration and reload and reconfigure itself automatically.			

H	Warranty The vendor should provide minimum of 3 years hardware replacement warranty. This warranty should be clearly mentioned in the Manufacturer's Authorization Letter issued by respective OEM on OEM letterhead.			