भारतीय प्रौद्योगिकी संस्थान मद्रास चेन्नै 600 036
INDIAN INSTITUTE OF TECHNOLOGY MADRAS Chennai 600 036
भंडार एवं क्रय अनुभाग
STORES & PURCHASE SECTION
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G. Chitrapavai
Deputy Registrar (Stores & Purchase)

Dated : 23.02.2019

Tender No. IITM/SPS /CC/GPON/009/2018-19

Dear Sirs,

On behalf of the Indian Institute of Technology Madras, Tenders are invited for

supply and installation of GPON equipment

confirming to the specifications enclosed.

Tender Documents may be downloaded from Central Public Procurement Portal **https://etenders.gov.in/eprocure/app** Aspiring Bidders who have not enrolled / registered in eprocurement should enroll / register before participating through the website https://etenders.gov.in/eprocure/app. The portal enrolment is free of cost. Bidders are advised to go through instructions provided at "Help for contractors". [Special Instructions to the Contractors/Bidders for the e-submission of the bids online through this eProcurement Portal"].

Tenderers can access tender documents on the website (For searching in the NIC site, kindly go to Tender Search option and type 'IIT'. Thereafter, Click on "GO" button to view all IIT Madras tenders). Select the appropriate tender and fill them with all relevant information and submit the completed tender document online on the website https://etenders.gov.in/eprocure/app as per the schedule attached.

No manual bids will be accepted. All quotation both Technical bid and Financial bid should be submitted in the E-procurement portal.

1	**LAST DATE for receipt of Tender**	:	**15.03.2019 (Friday) before 02.00 p.m.**
	Date, Time and Venue of opening of Tender	:	**18.03.2019 (Monday) at 03.00 p.m., Conference Room, 2nd floor, Administration Building**
	Pre bid meeting :	:	**04.03.2019 (Monday) at 03.00 pm Venue : Conference Room, 2nd floor, Admin Building If you need more clarification on this tender documents or specifications of the equipment, you are invited to attend the pre bid meeting to get the clarification**
A	**Submission of Tender**	:	As per the directives of Department of Expenditure, this tender document has been published on the Central Public Procurement Portal URL: https://etenders.gov.in/eprocure/app The bidders are required to submit soft copies of their bids electronically on the CPP Portal, using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the CPP Portal, prepare their bids in accordance with the requirements and submitting their bids online on the CPP Portal.

			More information useful for submitting online bids on the CPP Portal may be obtained at: https://etenders.gov.in/eprocure/app Both Technical Bid & Price Bid should be submitted separately in online CPP portal as per the specified format only. Right is reserved to ignore any tender which fails to comply with the above instructions. **No manual bid submission is entertained.**
B	**Instructions for online bid submission**	**:**	**REGISTRATION** i. Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal URL:https://etenders.gov.in/eprocure/app by clicking on "Online Bidder Enrollment". Enrolment on the CPP Portal is free of charge. ii. As part of the enrolment process, the bidders will be required to choose a unique user name and assign a password for their accounts. iii. Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the CPP Portal. iv. Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (Class II or Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify / TCS / nCode / eMudhra etc.) v. https://etenders.gov.in/eprocure/app?component=%24DirectLink&page=DSCInfo&service=direct&session=T with their profile. vi. Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSCs to others which may lead to misuse. vii. Bidder then logs in to the site through the secured log-in by entering their user ID / password and the password of the DSC / eToken.
Guidelines, Terms and Conditions of Tender			
C	**Searching for tender documents**		i. There are various search options built in the CPP Portal, to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, organization name, location, date, value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as organization name, form of contract, location, date, other keywords etc. to search for a tender published on the CPP Portal. ii. Once the bidders have selected the tenders they are interested in, they may download the required documents / tender schedules. These tenders can be moved to the respective **"My Tender"** folder. This would enable the CPP Portal to intimate the bidders through SMS / email in case there is any corrigendum issued to the tender document. iii. The bidder should make a note of the **unique Tender ID** assigned to each tender, in case they want to obtain any clarification / help from the Helpdesk.

D	**Preparation of bids**	**:**	i. Bidder should take into account any corrigendum published on the tender document before submitting their bids. ii. Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid. Please note the number of covers in which the bid documents have to be submitted, the number of documents including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid. iii. Bidder, in advance, should prepare the bid documents to be submitted as indicated in the tender document / schedule and generally shall be in PDF / XLS formats as the case may be. Bid documents may be scanned with 100 dpi with black and white option. iv. To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, GSTIN Details, annual reports, auditor certificates etc.) has been provided to the bidders. Bidders can use **"My Documents"** area available to them to upload such documents. These documents may be directly submitted from the "My Documents" area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process. **v. All the technical related documents need to be uploaded in Technical bids for evaluation purpose.**
E	**Submission of bids**	**:**	i. Bidder should log into the site well in advance for bid submission so that he/she upload the bid in time i.e. on or before the bid submission date and time. Bidder will be responsible for any delay due to other issues. ii. The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document. iii. Bidder has to transfer the EMD as applicable by online mode only. The EMD should be transferred on or before the closure date and time of the tender. If the EMD is not transferred before the closure date and time, the tender will be summarily rejected. The EMD transferred to IIT Madras (as per IIT Madras Account details given in Clause I (i) and the proof of transfer has to be submitted in the technical bid. Otherwise, the tender will be summarily rejected. iv. A standard BOQ format has been provided with the tender document to be filled by all bidders. Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. Bidders are required to download the BOQ file, open it and complete the detail with their respective financial quotes and other details (such as name of the bidder). If the BOQ file is found to be modified by the bidder, the bid will be rejected. v. The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission. vi. The **Tender Inviting Authority (TIA)** will not be held responsible for any sort of delay or the difficulties faced during the submission of bids online by the bidders due to local issues.

			vii.	The uploaded tender documents become readable only after the tender opening by the authorized bid openers.
			viii.	Upon the successful and timely submission of bids, the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date & time of submission of the bid with all other relevant details.
			ix.	Kindly add scanned PDF of all relevant documents in a single PDF file of compliance sheet.
F	**Assistance to bidders**	**:**	i.	Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender.
			ii.	Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk. The contact number for the helpdesk is [0120-4200462, 0120-4001002, 0120-4001005]
G	**General Instructions to the Bidders**	**:**	i.	The tenders will be received online through portal https://etenders.gov.in/eprocure/app. In the Technical Bids, the bidders are required to upload all the documents in pdf format.
			ii.	Possession of a Valid Class II/III Digital Signature Certificate (DSC) in the form of smart card/e-token in the company's name is a prerequisite for registration and participating in the bid submission activities through https://etenders.gov.in/eprocure/app
			iii.	Digital Signature Certificates can be obtained from the authorized certifying agencies, details of which are available in the web site https://etenders.gov.in/eprocure/app under the "Information about DSC".
H	**Opening of the tender**	**:**		The online bid will be opened by a committee duly constituted for this purpose. Online bids (complete in all respect) received along with scanned copy of EMD (if any) will be opened as mentioned at "Annexure: Schedule". Bid received without EMD (if present) will be rejected straight way. The technical bid will be opened online first and it will be examined by a technical committee (as per the eligibility criteria, specification and requirement). The financial offer/bid will be opened only for the offer/bid which technically meets all requirements as per the specification.
I	**Earnest Money Deposit (EMD)**	**:**	i.	**EMD for Rs. 3,50,000/- (Rupees three lakhs fifty thousand only) should be transferred to the following bank account on or before due date 15.03.19 (Friday), before 2 p.m.** Name : Registrar IIT Madras Bank : State Bank of India Account No. : 10620824305 Branch : IIT MADRAS IFSC CODE : SBIN0001055
			ii.	The EMD transferred to IIT Madras as per IIT Madras Account details given above and the proof of transfer has to be submitted in the technical bid. Otherwise, the tender will be summarily rejected.
			iii.	The EMD will be returned to unsuccessful tenderer only after the tenders are finalized.

			iv. **5% Performance Guarantee** of the order value has to be submitted by way of Bank Guarantee/DD by the successful bidder only. v. In case of successful tenderer, Performance Guarantee will be retained till the installation and completion of warranty period.
J	**Marking on Technical Bid**	**:**	i. The technical Specification for this tender is given in **Annexure A.** The tenderer shall go through the specification and submit the technical bid. ii. The Technical bid should be submitted in the proforma given as per **Annexure B in pdf format only through online (e-tender). No manual submission of bid is entertained.** iii. All technical bid should have the page-wise **heading as "Technical Bid" and page no.** in all pages with seal and signature of authorized signatory. The total no. of pages should be mentioned at the last page of the documents. iv. The technical bid should consist of all technical details along with catalogue/brochure and other technical, commercial terms and conditions.
K	**Marking on Price Bid**	**:**	**i.** Price bid should be submitted in the prescribed proforma **Annexure – C as per BOQ in PDF** format through e-tender only. **No manual submission of bid is entertained.** ii. Price bid should indicate item-wise price **for all the items** mentioned in the technical bid. iii. Total value in the price bid should be indicated in figures & words clearly. iv. Quote should be in INR
2	**Preparation of Tender:** a) You should quote your product as per our specification requirements by mentioning our requirements and your offer side by side and the rate should be in total as per our requirements. We will not make any calculation if you have mentioned the rates of items separately. b) The offer/bids should be submitted through online only in two bid system i.e. Technical Bid and Price Bid separately. The online technical bid will be first opened and evaluated. In the screening, the ***Vendor Eligibility Criteria and technical evaluations*** as per **ANNEXURE – B** will be evaluated. The Price bid of only those bidders whose vendor eligibility criteria and technical compliance are found to be adequate by the Committee will be opened.		
3	**Signing of Tender:** The Tender is liable to be rejected if complete information is not given therein or if the particulars and date (if any) asked for in the schedule to the Tender are not fully filled in or not duly signed/authenticated. Specific attention is drawn to the delivery dates and terms and conditions enclosed herewith. **Each page of the technical bid required to be signed and bears the official seal of the tenderers.** If the application is made by a firm in partnership, it shall be signed (with seal)by all the partners of the firm above their full typewritten names and current addresses or alternatively by a partner holding power of attorney for the firm in which case a certified copy of the power of attorney shall accompany the application. A certified copy of the partnership deed along with current addresses of all the partners of the firm shall also accompany the application. If a limited company or a corporation makes the application, it shall be signed by a duly authorized person holding power of attorney for signing the application, in which case a certified copy of the power of attorney shall accompany the application. Such limited company or corporation may be required to furnish satisfactory evidence of its existence. The applicant shall also furnish a copy of the Memorandum of Articles of association duly attested by a Public notary.		

4	**Period for which the offer will remain open:** i. Firms tendering should note the period for which it is desired that their offers should remain open for acceptance. If the firms are unable to keep their offers open for the specified period they should specifically state the period for which their offers are being provided, however, the day up to which the offer is to remain open being declared closed holiday for the Indian Institute of Technology Madras, the offer shall remain open for acceptance till the next working day. ii. Quotations qualified by such vague and indefinite expressions such as 'subject to immediate acceptance', 'subject to prior sale' will not be considered. iii. The Tender shall remain open for acceptance/validity till: **120 days from the date of opening of the tender**
5	**Prices:** i. The prices quoted must be nett. per unit as per the technical specification mentioned in **Annexure B** and must include all Shipping, Handling, etc.. **The prices quoted by the Tenderer should be inclusive of GST and other statutory levies** (and should be clearly stated to be so) which will be paid by the Purchaser/if legally leviable at the rate ruling on the date of supply as specified in the Acceptance of Tender. **The percentage of tax etc. included in the price should be indicated in clear terms. If the inclusive price is not given, we will treat your offered rate as inclusive rate and comparison be made with others.** If at the time of comparison of your offer without taxes etc. is happen to be lowest, you are bound to supply as per the offered rate, i.e. without taxes etc. ii. **Concessional GST :** IIT Madras is eligible for concessional GST @ 5% on IGST and @ 2.5% for CGST and SGST as per Notification No. 45/2017 – Central Tax (Rate) Dated 14th November 2017 & Notification No.47/2017 – Integrated Tax (Rate) Dated 14th November 2017, for procurement of Equipment and Consumables for research purpose. At the time of Invoicing, please state the concessional GST accordingly. During the supply of item, a certificate to this effect will be issued to your firm. iii. Hence you are requested to be careful while quoting for tender. **The price should be without customs duty since IIT Madras is eligible for payment of concessional customs duty against submission of Essentiality Certificate. The customs duty will be payable / reimbursable by us at the time of clearance on production of necessary proof. Hence these duties need not be included in the price while quoting**. Necessary document will be provided at appropriate time. **No price revision, changes in the specification already given or changes in the terms and conditions etc. during the period is acceptable**. iv. Discount, if any, should be indicated prominently.
6	**Payment: No Advance Payment will be made for Indigenous purchase.** Payment will be made only after supply and satisfactory installation and also technical clearance from Computer Centre, IITM. The vendor must supply soft copy & Hardcopy of wiring diagram after completion of the work.
7	**Terms and conditions :** Failure to comply with any of the instructions stated in this document or offering unsatisfactory explanations for non-compliance will likely to lead to rejection of offers.
8	**Right of Acceptance:** IIT MADRAS reserves the right to reject the whole or any part of the Tender without assigning any reason or to accept them in part or full.
9	**Communication of Acceptance:** Acceptance by the Purchaser will be communicated by Post, if required, and the Company's acceptance communicated to us formally in writing.

10	**Warranty: Warranty should be 5 years. Indicate price change (if any) for extra year warranty.** **Service : 8 X 5 X NBD** **AMC : Quote after the warranty period (5 years)**
11	**Delivery: Supply and installation has to be done in IIT Madras Campus.** Items should be delivered **within 4 weeks** from the date of P.O./Award of Contract (AOC). Please indicate the actual delivery period clearly. No further extension of time will be allowed. **Non delivery of items** will lead to cancellation of Purchase Order without any notice. In addition, action may be taken for removing them from our mailing list. **Installation: OEM/OEM certified professionals**
12	In terms of Rule 173 (iv) of General Financial Rules, 2017 the bidder shall be at liberty to question the bidding conditions, bidding process and/or rejection of its bid.
13	**Conditions of contract:** Tenderer should quote on the basis of the conditions referred to in Para of the invitation to tender and tender papers. In case these terms and conditions are not acceptable to the tenderer, he should specifically state the deviation(s) there from in the body of the tender.
14	**Transit Insurance:** The Purchaser will not pay separately for Transit Insurance.
15	**Tenderer shall submit along with his Tender:** Name and full address of the Banker and their swift code and PAN No. and GSTIN number.
16	**Guarantee:** The tenderer has to declare that the goods sold to the buyer under this contract shall be of the best quality and workmanship and shall be strictly in accordance with the specifications. Tenderer should indicate the period for which the said goods/articles would continue to confirm to the specifications.
17	**Jurisdiction:** All questions, disputes, or differences arising under, out of or in connection with the contract, if concluded, shall be subject to the exclusive jurisdiction at the place from which the acceptance of Tender is issued.
18	**Force Majeure:** The Supplier shall not be liable for forfeiture of its performance security, liquidated damages or termination for default, if and to the extent that, it's delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure. • For purposes of this Clause, "Force Majeure" means an event beyond the control of the Supplier and not involving the Supplier's fault or negligence and not foreseeable. Such events may include, but are not limited to, acts of the Purchaser either in its sovereign or contractual capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes. • If a Force Majeure situation arises, the Supplier shall promptly notify the Purchaser in writing of such conditions and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Supplier shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.
19	**Risk Purchase Clause:** In event of failure of supply of the item/equipment within the stipulated delivery schedule, the purchaser has all the right to purchase the item/equipment from the other source on the total risk of the supplier under risk purchase clause

20	**<u>For Technical Related Queries Contact :</u>** **Mr. V. Selvaraju, B.E., M.E.,** **Assistant Systems Engineer** **Computer Centre** **IIT Madras** **Chennai - 600 036.** **Phone No: 044- 2257 4988**
21	OEM may submit the quote directly or through a supplier/business partner.

Yours faithfully

-sd/-
Deputy Registrar
(Stores & Purchase Section)

ACKNOWLEDGEMENT

It is hereby acknowledged that I/We have gone through all the points listed under "Specification, Guidelines, Terms and Conditions" of tender document. I/We totally understand the terms and conditions and agree to abide by the same.

SIGNATURE OF TENDERER ALONG WITH SEAL OF THE COMPANY WITH DATE

DECLARATION

I/We/ M/s _____ hereby declare that we have the required certificate issued by OEM and I/We/M/s _____ _____ have office at Chennai with experts / specialists to handle installation, configuration and solving all types of issues in time.

SIGNATURE OF TENDERER ALONG WITH SEAL OF THE COMPANY WITH DATE

ANNEXURE – A

GPON EQUIPMENT	
I VENDOR ELIGIBILITY CRITERIA	
S. No.	**Description**
1	(a) The Supplier/Business partner should have office at Chennai with experts / specialists to handle installation, configuration and solving all types of issues in time. (b) Supplier/Business partner should have support & RMA (Return Material Authorization) Repair center in Chennai.
2	MAF - Manufacturer Authorization Form to be attached for the quoted specification – **(MAF to be attached for OLT, ONT, Splitter and Transceiver modules)**
3	The OEM and Supplier/Business partner should have experience in providing GPON Solution (OLT & ONT) directly or indirectly at least one reasonably large Local Area Network in Universities/Institutions having more than 1000 GPON nodes. (a) The deployment should be live at present and running for minimum 5 Years. (b) Certificate from the current organization where it is working (c) Copy of Purchase order (d) Installation report
4	The OEM and Supplier/Business partner should have presence in India for the past 10 Years
5	OLT, ONT and Transceiver OEM and Supplier / Business partner should be ISO 9001 (Quality Management) certified.
6	SPLITTER OEM and Supplier / Business partner should be ISO 9001 (Quality Management) and OEM should be ISO 14000 Certified.

S. No.	Technical Specification for GPON Equipment
1	Specify the proposed solution Brand name, Model no., Supporting software package details
2	**Quantity required:** (i) OLT with 8 PON : 4 nos. (ii) ONT with 12 V Adapter : 1311 nos. (iii) Splitter 1 x 2 : 46 nos. (iv) Splitter 1 x 4 : 14 nos. (v) Splitter 1 x 8 : 221 nos. (vi) Transceiver 10 Gbps short range compatible to OLT : 5 nos. (vii) PON Transceiver 2.5 Gbps compatible to OLT : 40 nos. (viii) Transceiver 10 Gbps SFP+ short range compatible to Cisco C6807 : 5 nos. (ix) Licenses and support software : 1 no. (x) Supplied products and licenses should be supported for 5 years 8 x 5 x NBD warranty from the date of Installation completion by OEM
	OLT and ONT:
3	The proposed GPON equipment should be complied with the following ITU-T standard: (i) G.984.1: General Characteristics (ii) G.984.2: Physical Media Dependent (PMD) layer (iii) G.984.3: Transmission convergence layer specification (iv) G.984.4: ONT management and control interface specification
4	GPON System should support high-speed data channel through a single optical fiber with an upstream rate of 1.244 Gbps and a downstream rate of 2.488 Gbps.Wavelength pattern:(i) 1310 nm wavelength for upstream traffic(ii) 1490 nm wavelength for downstream traffic(iii) 1550 nm wavelength for video service
5	The proposed GPON equipment should support the following features: (i) Dynamic Bandwidth Allocation (DBA) for upstream traffic (ii) Advanced Encryption Standard 128 Bit (AES) for downstream traffic (iii) Forward Error Correction (FEC) for upstream and downstream traffic

6	The proposed GPON OLT equipment should support the following services: (i) High Speed Internet access (ii) VPN Services (iii) Point-to-Point and Point-to-Multipoint Layer-2 services
7	The proposed GPON equipment should support the implementation of (i) VLAN per subscriber model (ii) VLAN per service model or (iii) the combination of both
8	**The GPON OLT should support:** (i) Minimum of 64 ONTs per PON Port (ii) Minimum of 512 ONTs per system (iii) Distance up to 20Km (iv) Class B+ and Class C+ & C++ GPON SFPs
9	**GPON Interface:** (i) Ports : 8 SFP ports, G.984.2 compliant (ii) Standard : Fully ITU-T G.984.1-5 and G.988 compliant (iii) Line rate :Downstream: 2.488 Gbps; Upstream: 1.244 Gbps (iv) Connector : SFP Plug-in module; SC/UPC on SFP (v) Link Budget : 28 dB Class B+ or 32dB Class C+; ITU G.984.2 Amd1 depending on SFP installed; 1:128 split (vi) Wavelength : Transmit: 1310+/-20nm; Receive: 1490+/-10nm (vii) Distance : up to 20 km (viii) OLS/OTM : ITU-T G.984.2Amd2 incl. Rx and Tx power (ix) TC layer : AES (128-bit key) and FEC RS (255,239) (x) DBA : DBRu mode 0 and mode 1 per G.983.4 (xi) GEM port-Ids : 4K per PON port, Multicast GEM (xii) T-CONT : 1-5, 8 queues per T-cont
10	**Ethernet Uplink Trunking Interfaces:** (i) 10GE/1GE : 2x SFP+ ports; 802.3ae / 802.3z (ii) 1GE : 4 x SFP ports; 802.3 / 802.3u / 802.3z
11	**Management Interfaces:** (i) Out-of-band : 1 Optical SFP Interface & 1 RJ45 (ii) Telnet/SSH : 1xUSB 2.0 for CLI via Hyper Terminal
12	**Switching**: (i) VLAN support : BBF TR.156 compliant; 1:1, N:1, VBES/TLS; (ii) VLAN Models : VLAN per customer Model and VLAN per Service Model with VLAN Translation as required (iii) Capacity : 88 Gbps Ethernet switching (iv) Performance : Full throughput non-blocking for all ports; 32K MACs; 4K VLANs; 1K multicast groups, Spanning Tree:STP (802.1d), RSTP (802.1w) (v) VLAN Mapping : untagged, priority tagged, port based, 802.1q single tagged, 802.1ad (Q-in-Q) double tagged (vi) Multicast : IGMPv2 (RFC2236), IGMPv3 (RFC3376) snooping & proxy (vii) Forwarding : IPv4, IPv6, MAC-forced forwarding (RFC4562) (viii) Mirroring : SNI and PON port mirroring (ix) OAM : Port Stats, PMs for Access & Network Ports,
13	**Security**: (i) DHCPv4/6 : DHCP (RFC2131/3315) snooping, filtering, relay (ii) DHCP Options : Option 82 (RFC3046) (iii) PPPoE : PPPoE intermediate agent (iv) Binding : Port, MAC (v) Protection : Broadcast / Multicast / DLF packet limit, IP anti-spoofing, MAC spoofing prevention, IP Source guard, Uplink Loop Detection (vi) PON : AES, Rogue ONT ONU/ONT detection, isolation and mitigation, SN, Password. SN+Password Authentication, ONU Auto Registration & ONU Auto Discovery (vii) ACLs : Layer 1~4 Packet Filtering (ACL), QoS Policing (IPv4 & Ipv6). CLI Access Control

14	**Protection**: (i) SNI : 802.3ad Static Link Aggregation, G.8032 ERPSv1/v2, Flex Links, Should have 4*1GE & 2*10G SFP+ with Flex Link Support (ii) GPON : G.984.1 Type B supported
15	**Quality of Service:** (i) Classification : 8 priority queues per GEM port, 802.1p TCI, 802.1q CoS, per port IP ToS/DSCP to 802.1p mapping/re-marking, Upstream Policing (ii) Congestion : Back pressure (802.3x Flow Control) (iii) Scheduling : SP, WRR, SrTcm and TrTcm,
16	**Management**: (i) Local : 2 Management Port, USB Ports, CLI via USB with multiple Privileges, LCT via MGT-B (ii) Remote : AEMS, SNMP v1/v2c/3, Telnet, SSH (iii) ONT/ONUs : Managed over OMCI, VEIP and TR-069 (iv) Authentication : RADIUS, TACACS+ management access authentication (v) Monitoring : RMON, Temperature, Humidity, Fan speed, CPU (vi) Alarms : Critical/ Major/Minor Severity; Alarm & Event logging, Local Alarm Storage, Syslog Logging (vii) Time Sync : NTPv4 (RFC5905)
17	**Operating Requirements:** (i) Operating Temperature : -5C to 65C (ii) Operating Humidity : 5% - 95% non condensing
18	**Physical Requirements:** (i) 19" / 21" / 23" Standard Rack Mountable, Equipment height not more than 1RU (ii) Full Front access Only (iii) Forced air cooling with field replaceable fan module (iv) Removable Fan tray with Fan control.
19	**Power Supply:** The GPON OLT equipment shall be operated at 230VAC **AC Input:** (i) VOLTAGE RANGE: 180 ~ 264VAC (ii) FREQUENCY RANGE: 47 ~ 63Hz (III) AC CURRENT (Typ.): 2A/230VAC (iv) Rated Power: < 100W
20	**10G Ethernet Multimode SFP+:** (i) Ethernet Standard: 10GBASE-SR (ii) Media: Multimode Fiber (850nm Wavelength) (iii) Connector: Dual LC Connector (iv) Distance: 300m (v) Form Factor: SFP+ (vi) Operating Temperature: 0˚-85˚C
21	**PON SFP Specification (Class C+):** (i) GPON .984.2Amd.1 Class C+ bi-directional optical transceiver (ii) Single Mode, Single fiber with 1490nm on Downstream (2.488Gbps), 1310nm on the Upstream (1.244Gbps) (iii) Class C+ link budget: 32dB (iv) Hot-swappable (v) SFP (Small Form-factor Pluggable) package with SC/UPC receptacle (vi) Compliant with TEC GR/PON-01/02 April 2008 (vii) Transmitter power - Min: +3 (dBm) (viii) Transmitter power - Max: +7 (dBm) (ix) Receiver power Min: -32 (dBm) (x) Receiver power Max: -8 (dBm)

22	**ONT Specifications:** Proposed ONT shall provide 1 Gigabit Ethernet port **General features**: (i) IEEE 802.1D bridge (ii) IEEE 802.1p (Quality of Service) (iii) IGMP Snooping v2/v3 (iv) Minimum of 8 T-CONTs per ONT (v) Learning MAC addresses ≥ 1024 (vi) MAC Address Limiting (vii) Dying gasp **VLAN features:** (i) IEEE 802.1Q (VLAN) (ii) Port-Based VLAN (iii) Q-in-Q or VLAN Stacking (iv) VLAN Translation **Subscriber Interfaces:** (i) 10/100/1000 Base-T with RJ-45 connector (ii) Temperature 0 to 50 ºC (iii) Humidity 5 to 95% non-condensing (iv) Wall or table mountable **Power Supply**: Power adapter: Input 100-240VAC, 50/60Hz; output: 12VDC, 1. A
23	Element Management System features: The Management features are the features that provide the abilities to the end user for configuring, setting and monitoring the equipment, parameters, status, problems and others of the PON equipment in the network. The proposed PON equipment should be complied with the following features. **Equipment management**: (i) OLT Management (ii) Remote software upgrade (iii) Uplink and PON Interface Management
24	**Terminal Management (ONT):** (i) Subscriber Interface Management (ii) Service Management (iii) Support ONT Create, Activate, Deactivate, Delete with wizards and by manual (iv) ONT Remote Software upgrade
25	**Fault Management:** (i) Must be fully FCAPS compliant (ii) Current Alarm Monitoring (Live alarm monitoring) (iii) History Alarm Monitoring (iv) Event Monitoring (v) Alarm Filtering
26	**Performance Management:** (i) Equipment Performance Statistics (ii) Interface Performance Statistics (iii) Export Performance Report
27	**Topology Management:** (i) Graphical, geographical, hierarchical and domain based network view (ii) ONT Auto / Manual Discovery
28	**Security Management:** (i) Support for Multiple User accounts (ii) Support for user group management (iii) Support for Role based access controls to the user
29	**Database Management:** (i) Manual and Scheduled backups of all NE configuration (ii) Manual and Scheduled backups of EMS database (iii) EMS Log management

30	**OLT and ONT Network Inventory Management:** (i) Support Different Service Profile (ii) Service Profile Management (iii) VLAN profile Management (iv) ONT Profile Management
	Splitter:
31	**Port configuration :** 1 x 2, 1 x 4, 1 x 8
32	**Lead Type:** (I) In: Bare Fiber, Out : Bare Ribbon (ii) In & out: φ 0.9 Micron Loose Tube
33	**Fiber Length (Input/output) :** 50 cm
34	**Connector In / Connector Out** : SC2/APC
35	**Insertion loss maximum (dB)(CR):** (i) 1x2 Splitter:4.0 (ii) 1x4 Splitter:7.2 (iii) 1x8 Splitter:10.5
36	**Uniformity maximum (dB):** (i) 1x2 Splitter:0.6 (ii) 1x4 Splitter:0.6 (iii) 1x8 Splitter:0.8
37	**PDL (Polarization Dispersion Loss) (dB):** (i) 1x2 Splitter:0.2 (ii) 1x4 Splitter:0.2 (iii) 1x8 Splitter:0.3
38	**Operating Wavelength:** (i) 1xn, 2xn 1260-1360 nm / 1480-1580 nm (ii) Return Loss (dB) : PC > 50, APC > 55 (iii) Directivity (dB) : > 55 (iv) Fiber Type : Single mode Fiber (ITU-T G.652 / ITU-T G657A) (v) Fiber color : IN – Transparent, OUT – Ribbon (vi) Operating & Storage Temperature : -40 to + 85 'C
39	**Connector Specifications:** (i) Insertion Loss : Mated pair: 0.3 dB max (ii) Return Loss : PC : 50 dB min, APC : 55 dB min (iii) Ferrule materials : Ceramic (Zirconia) (iv) Adapter Sleeve : Ceramic (Zirconia)

ANNEXURE – B

Technical Bid

S. No.	Firewall Appliances specifications	Compli-ance (YES/NO)	Proof * with page No.	Reference (URL Address with page No.
1. VENDOR ELIGIBLITY CRITERIA:				
1	*(a)* The Supplier/Business partner should have office at Chennai with experts / specialists to handle installation, configuration and solving all types of issues in time. – ***(Proof to be submitted as per proforma in Annexure-D)*** *(b)* Supplier/Business partner should have support & RMA (Return Material Authorisation) Repair center in Chennai. (***Proof to be submitted)***			
2	MAF - Manufacturer Authorization Form to be attached for the quoted specification – ***(MAF to be attached for OLT, ONT, Splitter and Transceiver modules)***			
3	The OEM and Supplier/Business partner should have experience in providing GPON Solution (OLT & ONT) directly or indirectly at least one reasonably large Local Area Network in Universities/Institutions having more than 1000 GPON nodes. (a) The deployment should be live from the date of tender and running for minimum 5 Years. (b) Relevant certificate from the current organization where it is working (c) Copy of purchase order (d) Installation report ***(Proofs to be submitted)***			
4	The OEM and Supplier/Business partner should have presence in India for the past 10 years. ***(Proof of purchase order to be submitted)***			
5	OLT, ONT and Transceiver OEM and Supplier / Business partner should be ISO 9001 (Quality Management) certified. ***(Certificate to be attached)***			
6	SPLITTER OEM and Supplier/Business partner should be ISO 9001 (Quality Management) and OEM should be ISO 14000 Certified. - ***(Certificate to be attached)***			
	* Mandatory			
2. TECHNICAL REQUIREMENT:				
1	Specify the proposed solution Brand name, Model no., Supporting software package details			
2	Quantity required: (i) OLT with 8 PON : 4 nos. (ii) ONT with 12 V Adapter : 1311 nos. (iii) Splitter 1 x 2 : 46 nos. (iv) Splitter 1 x 4 : 14 nos. (v) Splitter 1 x 8 : 221 nos. (vi) Transceiver 10 Gbps short range compatible to OLT : 5 nos. (vii) PON Transceiver 2.5 Gbps compatible to OLT : 40 nos. (viii) Transceiver 10 Gbps SFP+ short range compatible to Cisco C6807 : 5 nos. (ix) Licenses and support software : 1 no. (x) Supplied products and licenses should be supported for 5			

	years 8 x 5 x NBD warranty from the date of Installation completion by OEM			
	OLT and ONT:			
3	The proposed GPON equipment should be complied with the following ITU-T standard: (i) G.984.1: General Characteristics (ii) G.984.2: Physical Media Dependent (PMD) layer (iii) G.984.3: Transmission convergence layer specification (iv) G.984.4: ONT management and control interface specification			
4	GPON System should support high-speed data channel through a single optical fiber with an upstream rate of 1.244 Gbps and a downstream rate of 2.488 Gbps.Wavelength pattern:(i) 1310 nm wavelength for upstream traffic(ii) 1490 nm wavelength for downstream traffic(iii) 1550 nm wavelength for video service			
5	The proposed GPON equipment should support the following features: (i) Dynamic Bandwidth Allocation (DBA) for upstream traffic (ii) Advanced Encryption Standard 128 Bit (AES) for downstream traffic (iii) Forward Error Correction (FEC) for upstream and downstream traffic			
6	The proposed GPON OLT equipment should support the following services: (i) High Speed Internet access (ii) VPN Services (iii) Point-to-Point and Point-to-Multipoint Layer-2 services			
7	The proposed GPON equipment should support the implementation of (i) VLAN per subscriber model (ii) VLAN per service model Or (iii) the combination of both			
8	**The GPON OLT should support:** (i) Minimum of 64 ONTs per PON Port (ii) Minimum of 512 ONTs per system (iii) Distance up to 20Km (iv) Class B+ and Class C+ & C++ GPON SFPs			
9	**GPON Interface:** (i) Ports : 8 SFP ports, G.984.2 compliant (ii) Standard : Fully ITU-T G.984.1-5 and G.988 compliant (iii) Line rate :Downstream: 2.488 Gbps; Upstream: 1.244 Gbps (iv) Connector : SFP Plug-in module; SC/UPC on SFP (v) Link Budget : 28 dB Class B+ or 32dB Class C+; ITU G.984.2 Amd1 depending on SFP installed; 1:128 split (vi) Wavelength :Transmit: 1310+/-20nm; Receive:1490+/- 10nm (vii) Distance : up to 20 km (viii) OLS/OTM : ITU-T G.984.2Amd2 incl. Rx and Tx power (ix) TC layer : AES (128-bit key) and FEC RS (255,239) (x) DBA : DBRu mode 0 and mode 1 per G.983.4 (xi) GEM port-Ids : 4K per PON port, Multicast GEM (xii) T-CONT : 1-5, 8 queues per T-cont			

10	**Ethernet Uplink Trunking Interfaces:** (i) 10GE/1GE : 2x SFP+ ports; 802.3ae / 802.3z (ii) 1GE : 4 x SFP ports; 802.3 / 802.3u / 802.3z			
11	**Management Interfaces:** (i) Out-of-band : 1 Optical SFP Interface & 1 RJ45 (ii) Telnet/SSH : 1xUSB 2.0 for CLI via Hyper Terminal			
12	**Switching**: (i) VLAN support : BBF TR.156 compliant; 1:1, N:1, VBES/TLS; (ii) VLAN Models : VLAN per customer Model and VLAN per Service Model with VLAN Translation as required (iii) Capacity : 88 Gbps Ethernet switching (iv) Performance : Full throughput non-blocking for all ports; 32K MACs; 4K VLANs; 1K multicast groups, Spanning Tree:STP (802.1d), RSTP (802.1w) (v) VLAN Mapping : untagged, priority tagged, port based, 802.1q single tagged, 802.1ad (Q-in-Q) double tagged (vi) Multicast : IGMPv2 (RFC2236), IGMPv3 (RFC3376) snooping & proxy (vii) Forwarding : IPv4, IPv6, MAC-forced forwarding (RFC4562) (viii) Mirroring : SNI and PON port mirroring (ix) OAM : Port Stats, PMs for Access & Network Ports,			
13	**Security**: (i) DHCPv4/6 : DHCP (RFC2131/3315) snooping, filtering, relay (ii) DHCP Options : Option 82 (RFC3046) (iii) PPPoE : PPPoE intermediate agent (iv) Binding : Port, MAC (v) Protection : Broadcast / Multicast / DLF packet limit, IP anti-spoofing, MAC spoofing prevention, IP Source guard, Uplink Loop Detection (vi) PON : AES, Rogue ONT ONU/ONT detection, isolation and mitigation, SN, Password. SN+Password Authentication, ONU Auto Registration & ONU Auto Discovery (vii) ACLs : Layer 1~4 Packet Filtering (ACL), QoS Policing (IPv4 & Ipv6). CLI Access Control			
14	**Protection**: (i) SNI : 802.3ad Static Link Aggregation, G.8032 ERPSv1/v2, Flex Links, Should have 4*1GE & 2*10G SFP+ with Flex Link Support (ii) GPON : G.984.1 Type B supported			
15	**Quality of Service:** (i) Classification : 8 priority queues per GEM port, 802.1p TCI, 802.1q CoS, per port IP ToS/DSCP to 802.1p mapping/re-marking, Upstream Policing (ii) Congestion : Back pressure (802.3x Flow Control) (iii) Scheduling : SP, WRR, SrTcm and TrTcm,			
16	**Management**: (i) Local : 2 Management Port, USB Ports, CLI via USB with multiple Privileges, LCT via MGT-B (ii) Remote : AEMS, SNMP v1/v2c/3, Telnet, SSH (iii) ONT/ONUs : Managed over OMCI, VEIP and TR-069 (iv) Authentication : RADIUS, TACACS+ management access authentication (v) Monitoring : RMON, Temperature, Humidity, Fan speed, CPU (vi) Alarms : Critical/ Major/Minor Severity; Alarm & Event logging, Local Alarm Storage, Syslog Logging (vii) Time Sync : NTPv4 (RFC5905)			

17	**Operating Requirements:** (i) Operating Temperature : -5C to 65C (ii) Operating Humidity : 5% - 95% non condensing			
18	**Physical Requirements:** (i) 19" / 21" / 23" Standard Rack Mountable, Equipment height not more than 1RU (ii) Full Front access Only (iii) Forced air cooling with field replaceable fan module (iv) Removable Fan tray with Fan control.			
19	**Power Supply:** The GPON OLT equipment shall be operated at 230VAC **AC Input:** (i) VOLTAGE RANGE: 180 ~ 264VAC (ii) FREQUENCY RANGE: 47 ~ 63Hz (III) AC CURRENT (Typ.): 2A/230VAC (iv) Rated Power: < 100W			
20	**10G Ethernet Multimode SFP+:** (i) Ethernet Standard: 10GBASE-SR (ii) Media: Multimode Fiber (850nm Wavelength) (iii) Connector: Dual LC Connector (iv) Distance: 300m (v) Form Factor: SFP+ (vi) Operating Temperature: 0˚-85˚C			
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32	**Lead Type:** (I) In: Bare Fiber, Out : Bare Ribbon (ii) In & out: φ 0.9 Micron Loose Tube			
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34	**Connector In / Connector Out** : SC2/APC			
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38	**Operating Wavelength:** (i) 1xn, 2xn 1260-1360 nm / 1480-1580 nm (ii) Return Loss (dB) : PC > 50, APC > 55 (iii) Directivity (dB) : > 55 (iv) Fiber Type : Single mode Fiber (ITU-T G.652 / ITU-T G657A) (v) Fiber color : IN – Transparent, OUT – Ribbon (vi) Operating & Storage Temperature : -40 to + 85 'C			
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ANNEXURE – C

BOQ - PRICE BID FORMAT

Tender No.	**IITM/SPS /CC/GPON/009/2018-19**
Name of the item	**Supply and installation of GPON equipment**
Name of the Bidder	

S. No.	Description	Quantity in Nos.	Unit cost in INR	Tax in %	Tax in amount	Total cost in INR
1	OLT with 8 PON	4				
2	ONT with 12 V Adapter	1311				
3	Splitter 1 x 2	46				
4	Splitter 1 x 4	14				
5	Splitter 1 x 8	221				
6	Transceiver 10 Gbps short range compatible to OLT	5				
7	PON Transceiver 2.5 Gbps compatible to OLT	40				
8	Transceiver 10 Gbps SFP+ short range compatible to Cisco C6807	5				
9	Licenses and support software	1				
Shipping, handling and other charges whichever is applicable						
		Total amount				
Total amount in words:						

SIGNATURE OF TENDERER
ALONG WITH SEAL OF THE
COMPANY WITH DATE

Annexure – D

PROFORMA

1	Name of the company	
2	Contact person	
3	Chennai office address	
4	Phone	
5	Mobile	
6	E-maid ID	
7	Pan No.	
8	GST No.	

SIGNATURE OF TENDERER ALONG WITH SEAL OF THE COMPANY WITH DATE

SCHEDULE

Name of Organization	Indian Institute of Technology Madras
Tender Type (Open/Limited/EOI/Auction/Single)	OPEN
Tender Category (Services/Goods/works)	Goods/Services
Type/Form of Contract (Work/Supply/ Auction/ Service/ Buy/ Empanelment/ Sell)	Supply
Product Category (Civil Works/Electrical Works/Fleet Management/ Computer Systems)	**Supply and installation of GPON equipment**
Source of Fund (Institute/Project)	IIT Madras
Is Multi Currency Allowed	No
Date of Issue/Publishing	23.02.2019, Saturday
Pre-bid Meeting Date and time	04.03.2019, Monday, 3 p.m.
Document Download/Sale Start Date	23.02.2019, Saturday
Document Download/Sale End Date	15.03.2019, Friday
Last Date and Time for Uploading of Bids	15.03.2019, Friday, 2 p.m.
Date and Time of Opening of Technical Bid	18.03.2019, Monday, 3 p.m.
EMD	Rs.3,50,000/-
No. of Covers (1/2/3/4)	2
Bid Validity days (180/120/90/60/30)	120 Days
Address for Communication	**The Deputy Registrar** **Stores & Purchase Section** **IIT Madras** **Chennai – 600 036**
Contact details	**Technical related queries:** **Mr. V. Selvaraju, B.E., M.E.,** **Assistant Systems Engineer** **Computer Centre, IIT Madras** **Chennai - 600 036.** **Phone No: 044- 2257 4988** **E-mail id : selva@iitm.ac.in**
Email Address	adstores@iitm.ac.in