

**Request for Proposal**  
**On**  
**Upgradation of Punjab Tele-Education network**  
**Punjab EDUSAT Society**  
**2018**

O/o Director General School Education-cum-Project Director, Punjab

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## DEFINITIONS

Unless the context otherwise requires, the following terms whenever used in this tender and contract have the following meanings:

- "Client" or "DGSE" means Director General School Education or DGSE-cum-Project Director.
- "EDUSAT" or "PES" means Punjab EDUSAT Society.
- "ROT" Receive only Terminal
- "SIT" Satellite Interactive Terminal
- "LMS" Learning Management System
- "Department" or "DSE" means Department of School Education.
- "State HUB" means Head Quarters of Punjab EDUSAT Society where the Studios have been established and running at Phase-8, SAS Nagar
- "Contract/Agreement/Contract Agreement" means the agreement to be signed between the successful bidder and client.
- "Bidder" or "Vendor" means firm / company / business entity who submits bid in response to this tender.
- "Tender evaluation committee/committee" means the committee constituted by DSE and/or DGSE for evaluation of bids.
- "Contract" means the contract entered into by the parties with the Client for supply, install, repair & maintenance of hardware/software with the entire documentation specified in the tender separately for the Project.
- "Similar work" refers to the similar type of SATCOM project.
- "CAMC" means Comprehensive Annual Maintenance Contract of similar work.
- "State" means State of Punjab.
- "GCC" mean General Contract Conditions.
- "Proposals" or "Bids" means proposal or bid submitted by bidders in response to this tender issued by the Client for selection of HSMP.
- "INR" means currency in Indian Rupees.
- "The Term/ Contract / Contract Period" means three (3) year period of contract.
- "SLA" means Service Level Agreement.
- "Last Three Financial Years" means FY 2015-16, 2016-17& 2017-18.
- "DTE" means Department of Technical Education
- "DHE" means Department of Higher Education.
- "DME" means Department of Medical Education and Research.

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## Document Control Sheet

1	<b>Tender No.</b>	<b>DGSE/EDUSAT/2018-19/04</b>
2	<b>Description</b>	Request for Proposal On Upgradation of Punjab Tele-Education network
3	Start date & time of sale of tender (Only available in downloadable form at website mentioned)	As mentioned on the eproc website
4	Last Date and Time for submission of Queries/Clarifications	As mentioned on the eproc website
5	Date and Time for Pre-Bid Meeting	As mentioned on the eproc website
6	Last date and time for submission of bids	As mentioned on the eproc website
7	Date and time of opening of Pre-Qualification cum Technical bid	As mentioned on the eproc website
8	Date of Opening of Commercial bids	To be intimated later
9	<b>Address for Communication</b>	O/o Director General School Education, 1 <sup>st</sup> Floor, Vidya Bhawan, E-Block Phase-8, S.A.S. Nagar (Mohali) Contact No.– 0172-5218801
10	<b>Location of tender document</b>	Tender document can be downloaded from the website: <a href="https://eproc.punjab.gov.in">https://eproc.punjab.gov.in</a> and <a href="http://www.ssapunjab.org">www.ssapunjab.org</a>
11	<b>Cost of RFP document &amp; Mode of Payment</b>	<b>Rs. 1,000/-</b> (Rs. One Thousand Only) through online mode only.
12	<b>Earnest Money Deposit (EMD) &amp; Mode of Payment</b>	<b>Rs.12,00,000/-</b> (Rs. Twelve Lakh Only) through online mode only.
13	<b>Contact details</b>	Email: <a href="mailto:edusat.punjab@punjabeducation.gov.in">edusat.punjab@punjabeducation.gov.in</a>

## Guidelines for online tendering procedure

For participating in the above e-tendering process, the HMSPs shall have to get themselves registered with <https://eproc.punjab.gov.in> and get user ID and Password. Class-2 Digital Signature is mandatory to participate in the e-tendering process. For any clarification/difficulty regarding e-tendering process, please contact on **(for Technical) 0120-4001 002, 005, (for Payment related) 0172-4184406.**

### CONDITIONS:

1. Interested bidders can purchase the tender document online from website.
2. Tender processing fee to ITI shall be strictly paid through online mode (IPG/ Net Banking). Other mode of payment will not be considered.
3. Bidders/ Contractors, who wish to submit online tender can access tender document from the website, fill them and submit the completed tender document into Electronic Tender on the website itself. Bidders / Contractors shall attach scanned copies of all the paper, i.e. Earnest Money deposited, Tender Form Cost, Processing Fee & the certificates as required in Eligibility criteria.
4. Corrigendum / Addendum / Corrections/ Extensions, if any will be published on the website only.
5. If the date of opening of tender happens to be a holiday then the tender will be opened on the next working day.

### Note: -

The prospective bidders have the option to download the tender document from <https://eproc.punjab.gov.in> They have to pay non-refundable tender document fee and Processing Fee through online mode only **(IPG/ Net Banking)**. The payments of Tender form fee and EMD through online mode should be submitted before last date failing to which bid of respective bidders would not be opened.

If cost of the Tender Document & EMD are not paid as per above, the bid will be rejected out rightly.

Aspiring bidders who have not obtained the **User ID and Password** for participating in e-tendering may obtain the same by registering in e-procurement portal (<https://eproc.punjab.gov.in>).

**Authorized Signatory**

## 1.0 Introduction:

The Tele-Education network of Punjab (Nodal agency PES) is planning to upgrade the network for supporting educational needs of Punjab state. The objective of this proposal is to procure, Install and commission the new Hub baseband along with Satellite Interactive Terminals (SITs), Receive only Terminals (ROTs), network reconfiguration, upgradation of the existing ROTs to DVB-S2, etc. as per Scope of Work & Terms & Conditions of this proposal.

## 2.0 Scope of Work:

Sr. No.	Scope of Work	Compliance Yes/No, Noted	Remarks (If any)
2.1	Supply, Install and Commission VSAT Hub baseband as per specifications, & other details given in Annexure-1.		
2.2	The upgraded network shall use new learning management system (LMS) software. To support this, the network will require servers & Teacher PC at hub. These should be supplied, installed and commissioned. The specifications of subsystems of LMS are given in Annexure-2. (It may be noted that LMS will be arranged by the purchaser)		
2.3	Supply, Install and Commission new BUC & PLL LNB with existing 3.8m antenna. The specifications of BUC and PLL LNB are given in Annexure-3.		
2.4	Supply, Install and Commission remote SITs & co-located SIT as per specifications and other details given in Annexure-4.		
2.5	Supply, Install and Commission remote ROTs & co-located ROT as per the details given in Annexure-5.		
2.6	Vendor has to prepare the Acceptance Test Plan (ATP) document in mutual agreement with the purchaser. The document shall cover, but not limited to the following: <ul style="list-style-type: none"> <li>• Block Diagram</li> <li>• Brief description of each test detailing test method and expected outcome.</li> <li>• Functional tests for Network with co-located SIT &amp; ROT</li> </ul> Test and measurement equipment to be arranged by vendor during installation and ATP. Vendor will also have to arrange second SIT at Hub, for acceptance testing purpose, which could later be shifted to identified location.		
2.7	Vendor to impart operations training to the personnel working in Punjab EDUSAT Society, for Hub (Operation & Maintenance), SITs & ROTs and other equipment mentioned in this RFP. Necessary standard operating procedures, training, documentation, Diagrams, etc. should also be provided to the		

Sr. No.	Scope of Work	Compliance Yes/No, Noted	Remarks (If any)
	purchaser. Such a training shall be imparted wherever Vendor has the training facility.		
2.8	Vendor should provide minimum one year standard warranty for the items supplied.		
2.9	Vendor has to provide yearly quote for Comprehensive Annual Maintenance Contract (CAMC) of the supplied material after completion of the warranty period for a period of four years, as per details given in Annexure-6. Vendor has to undertake CAMC in case so ordered by the purchaser.		
2.10	<b>Hub Operations:</b> Vendor may depute a Hub Engineer at his own cost and his job and responsibilities will be as per Annexure-7.		
2.11	At present 36 SITs are planned to be procured. A rate contract will be instituted by the PES for further expansion of the network.		
2.12	Vendor has to configure the network/Hub in mutual agreement and discussion with PES.		

### 3.0 Terms and Conditions:

Sr. No.	Description	Compliance Yes/No, Noted	Remarks (If any)
3.1	It is a turnkey activity for supply, installation & commissioning, CAMC & Hub operations by a Prime Vendor. Any dependency on any sub-vendors/sub-contractors shall be managed by the Prime Vendor, hereinafter referred as Vendor.		
3.2	If so required, vendor may visit the existing Hub location at PES, SAS Nagar, prior to submission of bid.		
3.3	Vendor to submit the BID in two parts: <b>Part-1: Techno-commercial:</b> Vendor should provide point-to-point compliance to all Scope of work, Terms & Conditions & Specifications, Clauses and Annexures of the RFP. <b>This part must also contain copy of the Price bid (Part-2) but with the prices masked.</b> <b>Part-2: Price bid:</b> Vendor to provide the prices as per <b>Annexure-8</b> . Vendors should clearly mention all applicable taxes.		
3.4	Vendor must be either the OEM or an authorised representative of the OEM for the Hub baseband system. Vendor to submit the OEM Authorisation certificate/letter along with the Part-1 of the Bid.		
3.5	<b>The quote should be valid for minimum 180 days. The rate contract for SIT &amp; ROT items should be valid for 2 years.</b>		



Sr. No.	Description	Compliance Yes/No, Noted	Remarks (If any)
3.6	Vendor may attend pre-bid meeting at the purchaser premises to seek clarifications, if any. The date of the meeting will be communicated at the appropriate time through the website only.		
3.7	Following the pre-bid meeting, the purchaser reserves the right to issue corrigendum/addendum with respect to the RFP document through website only.		
3.8	<b>Delivery Details:</b>		
3.8.1	<b>Delivery Location for Hub:</b> Vendor to deliver the material of (1) Hub Baseband, (2) BUC, (3) LNB, (4) Servers and Computers for LMS, & (5) Co-located SITs (6) Co-located ROT at Hub site of PES, SAS Nagar.		
3.8.2	<b>Delivery Location of SITs &amp; ROTs:</b> Two SITs and one ROT shall be co-located with the Hub. Other SITs & ROTs shall be located at different colleges/institutions (hereinafter called Users). The locations for installations shall be provided by the Purchaser		
3.9	Vendor has to obtain the Certificate of delivery of material at Hub location from the Purchaser/In-charge/Coordinator.		
3.10	Vendor has to obtain the Certificate of delivery of material at remote SITs & ROTs from respective site Coordinators/In-charge or by concerned users.		
3.11	Vendor shall coordinate with purchaser for obtaining the shipping authorization, any document related to movement of the material, if required.		
3.12	Vendor has to extend necessary support to the purchaser to obtain regulatory clearances/licenses, in case required.		
3.13	<b>Time Schedule:</b> Supply, Installation, Commissioning and Acceptance testing of Hub baseband along with BUC, PLL LNB with co-located SIT(s) & ROT, should be completed within <b>120 days</b> from the date of acceptance of Purchase Order by the vendor.		
3.14	The rate contract shall be instituted only for the identified SIT & ROT items as per <b>Annexure 8, Table 3</b> . The rate contract shall be valid for a period of <b>2 years</b> from the date of initial purchase order. The same may be procured as per need.		
3.15	The rates of Hub operations, CAMC of Hub, CAMC of SITs, shall be valid, till the applicable timeline of the activity.		
3.16	<b>Payment Terms:</b> (For activities mentioned (in Sr. No. 2.1 to 2.5) under scope of work)		
3.16.1	Payment of 70% of the value of material delivered at Hub at PES, SAS Nagar and material of remote SITs & ROTs at		

Sr. No.	Description	Compliance Yes/No, Noted	Remarks (If any)
	respective site locations shall be made on pro-rata basis, within <b>one month</b> , based on submission of documentary evidence (Proof of Delivery and physical inspection) and invoices etc.		
3.16.2	Payment of balance 30% of the value of material delivered shall be made after successful installation and commissioning of Hub baseband system and remote SITs & ROTs, on pro-rata basis within one month based on submission of documentary evidence (I&C certificate) and invoices etc.		
3.16.3	However, in case the Hub or SITs or ROTs are not commissioned due to reasons attributable to the purchaser/users, vendor will be eligible to claim balance 30% of the value of material delivered, after three months of delivery.		
3.16.4	For services (installation & commissioning charge), 100% shall be paid after satisfactory completion of work.		
3.16.5	Payments shall normally be made within 30 days of submission of invoices along with certificates signed by the site coordinator, nodal agency coordinator and duly certified by authorized official of PES, SAS Nagar.		
3.17	<b>Liquidated Damage (LD) Clause:</b> (For 2.1 to 2.5 activities mentioned in scope of work) In the event, vendor fails to complete the activities within the schedule or any extension thereof allowed, Purchaser shall have the right to recover from the vendor, Liquidated Damages (LD), a sum at the rate of 0.5% per week of undelivered items/services, not exceeding 10% of applicable ordered value.		
3.18	<b>Force Majeure:</b> Should a part or whole of the supplies & services covered in this contract be delayed due to reasons of force majeure which shall include Lock-outs, general strikes (not limited to the contractor's establishment), riots, civil commotion, fire accidents, acts of God, war, stoppage of deliveries by Government, the schedules referred in the RFP shall be extended by a period(s) not in excess of duration of such force majeure event. Each party undertakes to advise the other as soon as it becomes aware of the circumstances of such force majeure event. So that actions under the provisions of those orders can be mutually reviewed and agreed upon between bidder and purchaser.		
3.19	<b>Performance Security:</b> The successful bidder shall be required to furnish Performance Security for 10% of Purchase Order value along with order acknowledgement towards satisfactory performance of the contract within 15 days. The performance security shall be submitted through bank guarantee and shall be valid for <b>6 months</b> beyond the warranty period.		

Sr. No.	Description	Compliance Yes/No, Noted	Remarks (If any)
	<p>DGSE shall forfeit the PBG in full or part in the following cases:</p> <ul style="list-style-type: none"> <li>• When the terms and conditions of contract are breached/ infringed</li> <li>• When contract is terminated due to non-performance of the Service provider</li> <li>• Notice of reasonable time will be given in case of forfeiture of PBG. The decision of DGSE in this regard shall be final.</li> </ul>		
3.20	<p><b>Arbitration:</b> Disputes, if any, shall be settled mutually, failing which it shall be referred to a one-man Arbitrator appointed by DGSE, PES, SAS Nagar in accordance with Indian Arbitration and Conciliation Act 1996, whose decision shall be final and binding on both the parties. The contract shall be governed by Indian Law, and Jurisdiction shall lie in the courts at Punjab/Chandigarh.</p>		
3.21	<p><b>Indemnity Clause:</b> Vendor shall indemnify Purchaser/PES or any other government body against any action, claim or proceedings relating to infringement of all or any of the prevailing laws like workman's Compensation Act 1923, Contract Labour (Regulation and Abolition) Act 1938, Industrial Disputes Act 1947, Employee's State Insurance Act 1952 during the currency of the order or any other Act specifically not mentioned. Purchaser/PES or any other government body/users shall not be responsible for any injury or loss of life to any of the vendor's personnel deployed for carrying out this work.</p>		
3.22	<p>Bidder must have <b>average Rs. 20 Crore turnover</b> per year in the last 3 financial years. (FY 2015-16, 2016-17 &amp; 2017-18.) CA Certificate to be enclosed.</p> <p>PES may review: Revenue requirement may be reduced/ avoided/ removed/ relooked for wider participation, if need be.</p> <p>Authentic certificate from the practicing fellow member of Institute of Chartered Accountant of India (FCA) confirming the turnover.</p>		
3.23	<p>The Bidder must have executed/executing at least one <b>similar work</b> worth <b>Rs. 5 crore</b> or two <b>similar works</b> worth <b>Rs. 2.5 crore</b> each for Govt. Sector/ PSUs/ reputed institutions/ Large corporates in the last 3 years as on 31/03/2018.</p> <p>Attach proof of certificates of running/completion satisfactorily of these projects from respective clients and also submit.</p>		

Sr. No.	Description	Compliance Yes/No, Noted	Remarks (If any)
3.24	<p><b>Earnest Money Deposit (EMD)</b></p> <p>a) The bidder shall furnish, as part of the Pre-qualification Bid cum Technical bid, an Earnest Money Deposit (EMD) as mentioned in document control sheet.</p> <p>b) The EMD shall be in Indian Rupees and shall be submitted online.</p> <p>c) EMD of all unsuccessful bidders would be released by DGSE after award of contract to the successful bidder. EMD will be valid for 3 months and the same will be released to the successful bidder within 30 days after the submission of Performance Bank Guarantee (PBG) &amp; signing of Contract, whichever is earlier.</p> <p>d) The EMD amount is interest free and will be refundable to the unsuccessful bidders without any accrued interest on it.</p> <p>e) The EMD lying with the DGSE in respect of other tender/ Tender Document/ RFP/ Expression of Interest etc. awaiting approval or rejected or on account of contracts being completed, will not be adjusted towards EMD for this Tender Document.</p> <p>f) The Earnest Money will be forfeited on account of one or more of the following reason:-</p> <ul style="list-style-type: none"> <li>i. Bidder withdraws its Bid during the validity period specified in Tender Document.</li> <li>ii. Bidder does not respond to requests for clarification of its bid.</li> <li>iii. Bidder fails to provide required information during the evaluation process or is found to be non-responsive.</li> </ul> <p>In case of a successful bidder, the said bidder fails to sign the Agreement in time; or furnish Performance Bank Guarantee</p>		

## Annexure-1

### 1.1. Technical Specifications: Hub Baseband System

Item No.	Parameter	Description	Compliance Yes/No	Remarks (If any)
1	Network Topology	Star		
2	Access Method	DVB-S2 Outbound and MF-TDMA Inbound or latest		
3	Remote terminals to be supported	Up to 1000		
4.1	Out-bound carrier (Forward link)	One Number		
4.2	In-bound carriers (Return Link)	Configurable up to 08 carriers (with 1:1 redundancy) or higher. Configurable up to 16 carriers (without redundancy) or higher.		
5	Compatibility	Integrate & function with the existing 3.8m Ku- band Antenna		
<b>Outbound Link (Hub to Remote)</b>				
6	Air interface	DVB-S2 ACM, Standard support, EN 302 307 or latest		
7	Outbound Frequency	L-band : 950-1700 MHz		
8	Modulation	QPSK, 8PSK, 16APSK, 32APSK		
9	Symbol rate	1.0 Msps to 45 Msps with 1 Msps step size		
10	FEC As per DVB-S2 specifications	LDPC + BCH or equivalent/better QPSK @ 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9 8PSK @ 3/5, 2/3, 3/4, 5/6, 8/9 16APSK @ 2/3, 3/4, 4/5, 5/6, 8/9 32APSK @ 3/4, 4/5, 5/6, 8/9		
11	BER	Quasi-error-free as per DVB-S2 standards Note: BER performance result of offered product with respect to DVB-S2 standard should be submitted with Quotation.		
<b>Return/Inbound channel link (Remote to Hub)</b>				
12	Access Scheme	MF-TDMA		
13	Input Frequency	950-1700 MHz		
14	Modulation	QPSK/OQPSK/4CPM or higher or equivalent with TPC / Turbo codes / LDPC or better and compatible with Hub baseband. (Vendor may quote for systems with similarly performing modulation & coding with suitable justification)		
15	Inbound channel Rate	256 Ksps to 4 Msps or higher		
16	FEC	TPC/Turbo Codes/LDPC or equivalent/better		
17	Bandwidth access schemes	BoD (Bandwidth on Demand) CIR (Committed Information Rates)		

Item No.	Parameter	Description	Compliance Yes/No	Remarks (If any)
		Support for Application triggered BoD & CIR (Static & Dynamic), MIR (maximum information rate) limit		
18	Bandwidth on Demand	Minimum every second update capability		
<b>Interface</b>				
19	Network	10/100/1000 Mbps Ethernet		
20	NMS	Web interface control, remote terminal Management/access , Standard SNMP interfaces		
21	Tx/ Rx	L-band: 950-1700 MHz Connector: Compatible to RF Output Level: Compatible to Hub RF Input level: Compatible to Hub RF		
<b>IP Traffic</b>				
22	Protocols supported	IPv4, IPv6 support, TCP, UDP, IGMP v2, SNMP, SIP etc.		
23	TCP acceleration	Yes, In both directions		
24	HTTP Web Perfecting and compression	Yes		
25	IP Header Compression	Yes, with UDP, TCP, RTP header compression		
26	Multicast	Yes, for outbound traffic		
27	NAT	Yes (via Gateway router or NAT manager)		
28	QOS support	Yes		
29	VLAN tagging	Yes		
<b>Network Controller Centre and Network Management system</b>				
30	Network Control Centre (include monitor, Keyboard & Mouse)	Network Control Centre (NCC) software to provide management and control over the VSAT network system with NMS run on Server. (Perpetual license)		
31	Network Management System (NMS) features NMS Functions includes: - Carrier Management - Network status monitoring - Configuration of all network components including remotes - Downloading of operational Software to remotes over the air - Enabling or disabling of remotes - Fault diagnosis and display of alarm - Performance Management - Traffic Management - Account Management - Subscribers authentication and management			
32	Hub baseband Redundancy	Fully redundant configuration (1:1 configuration). Vendor to state redundancies in the techno-commercial (Part-1 of the bid).		

Item No.	Parameter	Description	Compliance Yes/No	Remarks (If any)
<b>Others</b>				
33	Fade Countermeasure Support	Yes		
34	Scalability	Scalable forward, return link capacities and number of supported remotes.		
35	Accessories	Racks, mounting accessories, appropriate cable lengths, power distribution etc.		
<b>Environmental and Electrical</b>				
36	Operating conditions	Operating temperature: 0 deg C to +30 deg C Humidity: up to 90% relative humidity non-condensing at operating temperature		
37	Power Specifications	For operations on Indian standard power supply condition. (around 230 VAC; 50 Hz)		

## 1.2. LED Specifications

Item No.	Parameter	Description	Compliance Yes/No	Remarks (If any)
1	Technology	LED		
2	Size	49" or higher		
3	Resolution	1920x1080 or better (Full HD) LED Display		
4	Brightness	400 NITS or higher		
5	Refresh Rate/Motion flow	Minimum 50 Hz or more		
6	Viewing angle	178° x 178° or more		
7	Minimum Ports Required	Minimum: 1-USB, 2-HDMI, 1-RJ 45, 1-Component, 1-RS232, 1-VGA		
8	Audio ( Capacity of Speaker)	Built-in speaker for 2x10 W RMS power/total 20W or higher		
9	Power Supply	220-240/AC 100-240 Volt, 50-60 Hz		
10	Energy Saving	Yes		
11	Wall mount	Mandatory		
12	Certification	BIS, ROHS certification is mandatory. Energy star certified		

## Annexure-2

### Sub-system for Learning Management System (LMS)

#### 1.0 LMS Server System

Sr. No.	Description	Specification	Compliance (Yes/No)	Remarks, if any
1.	Server	Make: HP, DELL or equivalent		
1.1	Processor	Dual Intel Xeon Processor E5-2600 v4 series, 2.2 GHz, 10 cores or better		
1.2	Chipset	Intel C610 chipset or better		
1.3	Memory	16 GB DDR4 or better		
1.4	Hard Disk Drive	1 x 1 TB HDD 7200 RPM & 1 x 240 GB SSD or better		
1.5	PCI Slots	Minimum 4 PCIe slots 1 x PCIe x16 3.0 or better 2 x PCIe x8 3.0 or better		
1.6	Ports	2 x USB 3.0 or better, 2 x RJ-45 (100/1G) or better		
1.7	Optical Drive	8X DVD writer		
1.8	Power supply	Dual redundant power supply for operations on Indian standard power supply condition. (around 230 VAC; 50 Hz)		
2.	Keyboard	Standard Keyboard		
3.	Mouse	Optical Scroll Mouse		
4.	Monitor	23" LED Monitor or better		
5.	Software	Operating System: Microsoft Windows 2012 R2 64 bit or higher Microsoft Office 2016 Professional or higher		

#### 2.0 Teacher PC

Sr. No.	Description	Specification	Compliance (Yes/No)	Remarks, if any
1	PC	Make: HP, DELL or equivalent		
1.1	Processor	Intel Core i7-6700 (3.4 GHz, 4 cores) or better		
1.2	Chipset	Intel H110 Chipset or better		
1.3	Memory	8 GB DDR3 or better		
1.4	Hard Disk Drive	1 x 1TB HDD 7200 RPM SATA		
1.5	PCI Slots	1 x PCIe X16 or better		
1.6	Ports	1 x USB 3.0 or better, 1 x RJ-45 (100/1G), provision for audio out, mic in, and for Keyboard and mouse		
1.7	Optical Drive	8X DVD writer		



<b>Sr. No.</b>	<b>Description</b>	<b>Specification</b>	<b>Compliance (Yes/No)</b>	<b>Remarks, if any</b>
1.8	Power supply	For operations on Indian standard power supply condition. (around 230 VAC; 50 Hz)		
2	<b>Capture card</b>			
2.1	Support Software	DirectShow, VLC Media Player		
2.2	Video Input	S-Video / Composite, HDMI		
2.3	Audio Input	Mono or better		
2.4	Video Resolution	720x576, 1920x1080		
3.	Keyboard	Standard Keyboard		
4	Mouse	Optical Scroll Mouse		
5.	Monitor	23" LED Monitor or better		
6.	Software	Operating System: Microsoft Windows 10 professional 64 bit or higher Microsoft Office 2016 Professional or higher		

### Annexure-3

## Technical Specifications: BUC & PLL LNB for Hub

### 1.0 40W Ku- Band BUC:

Sr. No.	Description	Specification	Compliance (Yes/No)	Remarks, if any
1	Technology	GaN		
2	Transmit Frequency	13.75 to 14.50 GHz		
3	Input Frequency	L-band (As per Hub interface).		
4	Saturated Output Power	46 dBm		
5	Gain	Minimum 63 dB		
6	RF Input Interface	N-Type female		
7	RF Output Interface	WR75/G		
8	Monitoring and Control	Required		
9	Features	<ul style="list-style-type: none"> <li>• Weather proof construction</li> <li>• Reference (External frequency 10 MHz)</li> </ul>		
10	Accessories	Flexible and rigid waveguide Replacement Fans		
11	Operating Temperature	-10 to +55 degree C		
12	Humidity	100% condensing		
13	Primary Power	For operations on Indian standard power supply condition. (around 230 VAC; 50 Hz)		
14	Interface cables and waveguide to integrate with 3.8 meter antenna	To be supplied.		

### 2.0 PLL LNB for Hub:

Sr. No.	Description	Specification	Compliance (Yes/No)	Remarks, if any
1	RF Frequency (Input)	10.95 – 11.70 GHz		
2	External reference Frequency	10.0 MHz		
3	Stability	Dependent on external reference source		
4	L-Band output Frequency	950 to 1700 MHz		
5	Input Interface	WR-75		
6	Output Interface	Suitable interface to be provided		
7	Noise Figure	< 1.0 dB		
8	Conversion Gain	55 dB minimum		
9	Power Requirement	+15 to +24 V DC		
10	Operating Temperature	-10 to +55 degree C		

## Annexure-4

### Technical Specifications: 1.2m SIT Terminal

#### 1.0. 1.2m Ku-Band antenna with feed & Non Penetrating mount

Sr. No.	Description	Specification	Compliance (Yes/No)	Remarks, if any
1	Antenna diameter	1.2 meter		
2	Dish Type	Single Reflector, GFRP		
3	Reflector Optics	Offset focus		
4	Mount	Non penetrating mount, AZ-EL		
5	Band of operation	Ku-Band Uplink: 13.75 – 14.50 GHz Downlink : 10.95 – 11.70 GHz		
6	Polarization	Linear (Vertical or Horizontal configurable)		
7	G/T at 20 degree EL & at Mid band	Minimum 20 dB/K typical		
8	Cross-Pol. Isolation	25 dB minimum		
9	Wind Speed tolerance	Operational: 80 Km/Hours (Minimum) Survival: 160 Km/Hours (Minimum)		

#### 2.0. PLL LNB for SIT

Sr. No	Items	Descriptions	Compliance (Yes/No)	Remarks, if any
1	RF Frequency (Input)	10.95 – 11.70 GHz		
2	Local Frequency (LO)	10.0 GHz		
3	Local Stability	± 10 ppm		
4	L-Band output Frequency	950 to 1700 MHz		
5	Input Interface	WR-75		
6	Output Interface	Suitable interface to be provided		
7	Noise Figure	< 1.0 dB		
8	Conversion Gain	55 dB minimum		
9	Power Requirement	+12 to +24 V DC		
10	Operating Temperature	-10 to +55 degree C		

#### 3.0. Ku Band BUC for SIT

Sr. No.	Items	Description	Compliance (Yes/No)	Remarks, if any
1	L – Band Input Frequency	950 to 1450 MHz		
2	Ku-Band Output Frequency	14.00 to 14.50 GHz		
3	Power	4 Watts		
4	LO	13.05 GHz		
5	Output Interface	Waveguide, WR-75		
6	Conversion Gain	55 dB minimum		

Sr. No.	Items	Description	Compliance (Yes/No)	Remarks, if any
7	External Reference	10 MHz		
8	Power Requirement	+15 to +24 V DC		
9	Input Interface	F-type (female)		
10	Operating Temperature	-10 to +55 degrees C		

#### 4.0. IDU: Satellite modem compatible with Hub baseband

Sr. No.	Description	Specifications	Compliance (Yes/No)	Remarks, if any
1	Compatibility	Must integrate and function with the SIT RF subsystem and Hub baseband.		
2	Modulator Output	L-Band		
3	Demodulator input	L-Band		
4	Baseband Physical Data Interface	RJ45, 10/100/1000 Mbps Ethernet (Data and configuration ports)		
5	Symbol rate	Compatible to Hub baseband		
6	Modulation & Coding	Compatible to Hub Baseband		
7	Protocols Support	Compatible to Hub Baseband		
8	IP traffic Compression and Acceleration	Compatible to Hub Baseband		
9	Traffic Engineering (QoS)	Compatible to Hub baseband		
10	Primary Power	For operations on Indian standard power supply condition. (around 230 VAC; 50 Hz)		

#### 5.0. SD & HD capable Encoder with interfaces

A professional grade SD and HD Encoder with necessary interfaces (internal/external Embedder etc.) to accept studio inputs of (SDI/HD-SDI and analog Audio).

Sr. No	Parameter	Compliance (Yes/No)	Remarks, if any
1	The offered encoder should be a standalone unit with easy to use front panel control		
2	On loss of Video input it should automatically switch to customized pattern or test pattern.		
3	Should have latest SD/HD MPEG-4 AVC video encoding and compression algorithm		
4	Should support AAC/HE-AAC or equivalent for Audio Codec		
5	Should be Broadcast-grade upscale/ downscale facility		
6	Should have Logo insertion feature		
7	Input : SD-SDI (SMPTE 259M) and HD-SDI (SMPTE 292M) serial digital video and ASI input for data		
8	Output: MPTS and SPTS (IP streaming)		
9	CODEC MPEG-2: MP@ML and HL 4:2:0 MPEG-4 AVC : MP@L3 and L4 and HP@L3 and L4		
10	Video output bitrate range (1– 45 Mbps) or better		
11	Encoding Schemes: CBR,VBR		
12	Resolutions and Frame Rates:		

Sr. No	Parameter	Compliance (Yes/No)	Remarks, if any
	576i@25Hz,720p@50Hz,1080i@25Hz,1080p@25 Hz		
13	Audio Formats and Bitrates MPEG-1 Layer II:32-192 kbps AAC-LC/HE-AAC:32-128 kbps		
14	CONTROL AND MONITORING Should have web based control and monitoring facilities.		
15	Rack Mountable 1 RU x 19 in		
16	Power: 100-240V AC		
17	Operating Temperature: 5° to 40° C		
18	Humidity : 90%		

### 6.0. Multiplexer unit

Sr. No.	Features	Compliance (Yes/No)	Remarks, if any
1.	Multiplexer with Statistical Multiplexing capability		
2.	Output bitrate configurable through Statmux configuration		
3.	Stat Mux facility should support at least 16 channels per stat Mux pool.		
4.	The multiplexer shall be capable of transmission of broadcast data signals along with video and audio.		
5.	Interfaces of inputs from Encoders and outputs to Modulator should be clearly defined in the proposal.		
6	Redundancy: Multiplexer should support N+1 as well as N+P redundancy through NMS control		
<b>IP Specifications</b>			
7.	Type: Gigabit Ethernet		
8.	Ports: Minimum Two Independent Ports		
9.	I/O Speed: 900Mbps minimum		
10.	IP Encapsulation: MPEG-2 TS Over IP		
11.	MPEG Format: 188 B per TS		
12.	Addressing: Unicast/Multicast		
13.	Ethernet Interface: 1000Base T2		
<b>ASI Specifications</b>			
14.	Format: DVB-ASI		
15.	Connector: BNC		
16.	Interface Speed: 200 Mbps per port		

### 7.0. L-Band Modulator

Sr. No.	Description	Specifications	Compliance (Yes/No)	Remarks, if any
1	Output frequency	950-1700 MHz		
2	Frequency stability (internal reference)	$\pm 5 \times 10^{-8}$ over 0°C to 70°C		
3	Output level	-35/+5 dBm (+/-2dB)		
4	Output impedance	50 ohms		
5	Output connector	SMA (F) preferable		
6	Output return loss	>14 dB		

Sr. No.	Description	Specifications	Compliance (Yes/No)	Remarks, if any
7	Spurious Output	Better than -65 dBc/4kHz @ +5 dB level and > 256 kbaud		
8	Synthesizer Phase Noise	Should meet the requirement of IESS-308		
9	CW mode	Selectable		
10	Transmission rate	Variable, 1-45 Mbps		
11	Modulation code	QPSK, 8PSK		
12	Outer coding	BCH		
13	Inner coding	LDPC R= 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 (for DVB S2, QPSK), R= 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 (for DVBS2, 8PSK)		
14	Spectrum Roll off factor	20%, 25% and 35% selectable		
15	Modulation mode	Should be capable of emitting signals on the following mode 1. DVB-S2 2. Constant Coding and Modulation mode (CCM)		
16	Input interface	ASI/SPI interface • 2 selectable ASI input on BNC (F) – 75 ohms • SPI on 25 pin sub-D-connector		
17	Reference	10 MHz (Uniform as per system design to be mentioned & justified during DR)		
18	The offered modulator should be compact, reliable and have state of the art technology. - 1RU with Dual PSU			
19	It should provide IF output as per DVB-S2 standard's modulation schemes, one scheme at a time.			
20	Modulators will be used in 1+1 redundant mode.			

### 8.0. L Band Combiner

Sr. No.	Description	Specifications	Compliance (Yes/No)	Remarks, if any
1.	Capacity	4-way minimum		
2	Frequency Range	950-1700 MHz minimum		
3.	L Band I/O Interface	50 ohms N Connector		
4.	Input & Output Return loss	14 dB minimum		

### 9.0. PC for SIT (Student PC)

Sr. No.	Description	Specifications	Compliance (Yes/No)	Remarks, if any
1	PC	Make: HP, DELL or equivalent		

Sr. No.	Description	Specifications	Compliance (Yes/No)	Remarks, if any
1.1	Processor	Intel Core i5-6500 (3.2 GHz, 4 cores) or better		
1.2	Chipset	Intel H110 Chipset or better		
1.3	Memory	8 GB DDR3 or better		
1.4	Hard Disk Drive	1 x 1TB HDD 7200 RPM SATA		
1.5	PCI Slots	1 x PCIe X16 or better		
1.6	Ports	1 x USB 3.0 or better, 1 X RJ-45 (100/1G), provision for audio out, mic in, and for Keyboard and mouse		
1.7	Optical Drive	8X DVD writer		
1.8	Power supply	For operations on Indian standard power supply condition. (around 230 VAC; 50 Hz)		
2.	Graphics card	Dual ported Graphics card (One output for PC monitor and second HDMI output for Display TV)		
3.	Keyboard	Standard Keyboard		
4.	Mouse	Optical Scroll Mouse		
5.	Monitor	23" LED Monitor or better		
6.	Software	Operating System: Microsoft Windows 10 professional 64 bit or higher		

#### 10.0. Webcam

Sr. No.	Description	Specifications	Compliance (Yes/No)	Remarks, if any
1	Microphone Type	Built-in		
2	OS Compatibility	Windows 10 and higher versions		
3	Mounting Options	Mounting on monitor / LED TV		
4	Video Resolution	Should support HD		
5	Interface	USB 2.0 or better		
6	Accessories	All required accessories like mounting clip, cables, etc. to be provided		

#### 11.0. Wired Microphone with Phantom Power supply unit

Sr. No.	Description	Specifications	Compliance (Yes/No)	Remarks, if any
1	Transducer type	Condenser		
2	Polar pattern	Cardioid or better		
3	Frequency response	50Hz to 15 KHz		
4	Sensitivity	≥3mV/pa or -44dBV/pa		
5	Output impedance	50 to 200 Ohms		
6	Connector	3 Pin XLR		
7	ON/OFF Switch should be available			
8	Maximum Sound pressure level at 1 kHz	140 dB to 150 dB		

Sr. No.	Description	Specifications	Compliance (Yes/No)	Remarks, if any
9	Should be provide following cables: a. balanced XLR Male to XLR Female 10 meter b. XLR Female to 1/8"(3.5mm) mini plug -E.P connector - 2 meter (for connecting to PC Input).			
10	Compatible phantom power supply for Microphone with power adapter			
10.1	No Of Channel	Minimum 1		
10.2	Input/output connector	XLR		
10.3	It should be able to interface with both line as well as mic			

#### 12.0. 2 KVA UPS

Sr. No.	Description	Specifications	Compliance (Yes/No)	Remarks, if any
1	UPS Type	Online UPS		
2	Maximum Power (VA)	2000		
3	UPS Efficiency	85% to 92%		
4	Power Factor	0.90 or better		
5	Standard Indicators and Alarms should be available			
6	AC Input Voltage, Frequency, phase	Single Phase 160 V to 260V, 50 Hz $\pm$ 3 Hz		
7	Output Wave Form & Voltage	Pure Sine wave 220/230/240 VAC		
8	Overload Indication should be available			
9	Number of Batteries	6 Nos., 12V, 45 AH, SMF Batteries		

#### 13.0. 1 KVA UPS

Sr. No.	Description	Specification	Compliance (Yes/No)	Remarks, if any
1	UPS Type	Online UPS		
2	Maximum Power (VA)	1000		
3	UPS Efficiency	Minimum 85%		
4	Power Factor	0.90 or better		
5	AC Input Voltage, Frequency, phase	Single Phase 160 V to 260V, 50 Hz $\pm$ 3 Hz		
6	Output Waveform & Voltage	Pure Sine wave 220/230/240 VAC		
7	Number of Batteries	3 Nos., 12 V, 65 AH, SMF Batteries		
8	Standard indicators and alarms should be available			

**14.0. Transmit/Receive RF Cables with Connectors: RG-6 type cable with appropriate interface connectors and minimum 30 meters' cable length to be provided (Tx/Rx).**

**Note: Format of Installation & Commissioning certificate for SITs is given in Annexure-9**



**Annexure-5**  
**Items for 0.9m ROT Terminal**

<b>Sr. No.</b>	<b>Description</b>	<b>Compliance (Yes/No)</b>	<b>Remarks, if any</b>
1	0.9 m Ku-band antenna		
2	Ku-band LNBF		
3	DVB-S/S2 Set Top Box with remote control		
4	RG-6 type cable with connectors (minimum 30 meters' cable length to be provided).		
5	Any other additional item required. (to be mentioned and quoted)		

## Annexure-6 CAMC activity

**Table-1: CAMC activities for Hub**

Sr. No.	Description	Compliance (Yes/No/Noted)	Remarks, if any
	<b>Scope of Work</b>		
1	After completion of warranty, vendor to undertake CAMC of Hub for a period of four years (yearly basis), if so ordered.		
2	Vendor to undertake CAMC of (a) 3.8-meter Antenna (b) Hub baseband (c) LMS servers (d) Teacher PCs (e) BUC (f) PLL LNB at PES, SAS Nagar. During CAMC, repair/replacement of these items of Hub shall be at no extra cost.		
3	Vendor to take necessary precautions like two-way transit insurance etc. of material whenever the items are handed over by Purchaser for repairs/replacement.		
4	Vendor shall visit and rectify fault at Hub as and when complaint is logged.		
5	Vendor should coordinate with purchaser for carrying out CAMC activities.		
6	In case of a fault, which cannot be addressed immediately, vendor shall be permitted to provide temporary replacement of faulty items. (Till the items/Sub-Systems are repaired/replaced). The items/sub-systems arranged by vendor on temporary basis to keep the Hub operational shall be replaced within 3 months by the repaired original or replaced by new systems or their equivalent or better. Safe to & fro movement of the faulty items/sub-systems shall be responsibility of vendor.		
7	<b>Preventive Maintenance (PM)</b> Preventive maintenance shall be carried out twice in a year. Hub shall be thoroughly checked during PM.		
8	Vendor shall prepare a detailed maintenance report for each maintenance activity carried out for Hub and take signature of the Purchaser.		
10	<b>Helpdesk</b>		
10.1	Bidder will provide landline, mobile numbers, email details of Helpdesk logging of the complaints.		
10.2	Helpdesk should be available from Monday to Saturday during working hours.		
10.3	Helpdesk to issue docket/complaint number to purchaser and maintain log book.		
11	<b>Payment Terms for CAMC of Hub:</b> The CAMC charges shall be paid on pro-rata basis at the end of each quarter on submission of invoice along with user certified documents duly verified & approved by Focal Person of the purchaser.		
12	<b>LD Clause specific to CAMC of Hub</b>		
12.1	Vendor shall attend to complaint logged, identify, repair/replace the faulty item and make Hub operational within 2 working days from date of complaint logging in case of faults which only calls for on-		

Sr. No.	Description	Compliance (Yes/No/Noted)	Remarks, if any
	site repair. Permitted down time will be up to 7 working days for major failures which requires faulty items to be moved for repairs and temporary arrangement of alternate working items.		
12.2	For each subsequent day of delay after applicable down time from the date of complaint logging, 1.0 % of the quarterly CAMC value per day will be deducted from the bill of quarterly CAMC value.		
12.3	If delay is due to force majeure conditions or on the part of Purchaser's side, LD clause will not be applied.		
13	<b>Termination of CAMC of Hub</b> Purchaser reserves the right to terminate the CAMC in full or part by giving one month's notice in writing without any financial implications on either side.		

**Table-2: CAMC activities for SITs**

Sr. No.	Description	Compliance (Yes/No/Noted)	Remark if any
1	After completion of warranty, vendor to take CAMC of SITs for a period of four years, if ordered.		
2	During CAMC, repair/replacement of any covered item of SIT shall be at no extra cost.		
3	Vendor shall visit and rectify fault at any remote SIT, as and when complaint is logged.		
4	Vendor shall provide replacement of faulty items systems on temporary arrangement. (Till the items/sub-systems are repaired/replaced). The items/sub-systems arranged by vendor on temporary basis to keep the SITs operational shall be replaced within 1 month by the repaired original or replaced by same make/model no or its equivalent or better. Safe to & fro movement of the faulty items/sub-systems shall be responsibility of vendor.		
5	Vendor should be able to directly contact the site coordinator of SITs, at respective locations for carrying out CAMC activities		
6	The CAMC quarter (start date) will be decided on the basis of the date of the acceptance of the CAMC of SIT by the vendor under which;		
6.1	If the date of acceptance of CAMC for an SIT is in first half of the month, the start date of CAMC will be considered from 1st day of that particular month.		
6.2	If the date of acceptance of CAMC for a remote SIT is in second half of the month, the date of CAMC will be considered from 1st day of the next month.		
6.3	In case of deletion of an SIT from CAMC, Vendor shall be entitled for payment of the running month on pro rata basis.		
7	<b>Payment Terms for CAMC of SITs:</b> The CAMC charges shall be paid on pro-rata basis at the end of each quarter on submission of invoice along with user certified documents duly verified & approved by Focal Person of the purchaser.		

Sr. No.	Description	Compliance (Yes/No/Noted)	Remark if any
8	<b>LD Clause</b>		
8.1	Vendor shall attend to complaint logged, identify, repair/replace the faulty item and make SIT operational within 2 working days from date of complaint logging.		
8.2	For each subsequent day of delay after applicable down time from the date of complaint logging, 1.0 % of the quarterly CAMC value per day will be deducted from the bill of quarterly CAMC value. LD will be applicable even when SITs are non-functional due to non-functional Hub (if Hub is under CAMC with same vendor).		
8.3	If delay is due to force majeure conditions or on the part of Purchaser, penalty clause will not be applied.		
9	<b>Preventive Maintenance (PM):</b> Preventive maintenance shall be carried out once in a year during second and third quarter of the currency of CAMC contract. SITs shall be thoroughly checked during PM.		
10	<b>Helpdesk</b>		
10.1	Bidder will provide landline, mobile numbers, email details of Helpdesk along with online portal for logging of the complaints.		
10.2	Helpdesk should be available from Monday to Saturday during working hours.		
10.3	Helpdesk to issue docket/complaint number to purchaser and maintain log book.		
11	Service engineer of vendor shall prepare a proper document of every visit and should take the signature of the site coordinator of respective SIT.		
12	Certificate of CAMC of SITs shall be obtained from respective site coordinators.		
13	<b>Termination of CAMC of SITs</b> Purchaser reserves the right to terminate the CAMC in full or part by giving one month's notice in writing without any financial implications on either side.		
14	<b>Addition/Deletion of SITs during of tenure of the CAMC:</b>		
14.1	Purchaser/User reserve the right to add or delete any SIT(s) on pro-rata cost basis during tenure of the CAMC. The SIT(s) which are in working order, shall be added/deleted to the CAMC at the discretion of Purchaser/User.		
14.2	Any deletion / addition of SIT(s) from the CAMC will be effective at the beginning of month. Purchaser/User shall notify vendor addition or deletion of sites, if any.		

## Annexure-7 Hub operations

Sr. No.	Description	Compliance (Yes/No)	Remark if any
<b>1</b>	<b>Qualification of Engineer:</b>		
1.1	The Hub Engineer deployed should be a trained professional with minimum qualification of Diploma in Electronics.		
1.2	Hub Engineer should be capable of managing the network activities end to end.		
1.3	The vendor shall submit the Bio Data and two copies of passport size photographs to Purchaser/nodal agency of the personnel being deputed to operate Hub at PES, SAS Nagar		
<b>2</b>	<b>Hub Operation Activities</b>		
2.1	<p>Hub Operation include activities like-</p> <ul style="list-style-type: none"> <li>• Operate &amp; Monitor the Hub during working Hours.</li> <li>• Monitor the entire VSAT Network.</li> <li>• Fault finding.</li> <li>• Co-operating with field team visiting for maintenance / fault finding.</li> <li>• Preparation of operation and status report.</li> <li>• Maintain log-book of day-to-day operations.</li> <li>• To attend calls of remote SITs in the network for day-to-day operation and provide technical support for resolving minor issues.</li> <li>• To support deployment of new SIT in the network and update SIT population in NMS server.</li> </ul> <p>To operate LMS software and provide support in installation/operations of LMS clients on new SITs.</p>		
<b>3</b>	<b>Terms &amp; Conditions</b>		
3.1	The Hub Engineer deployed shall attend duties using their own transport arrangement and shall be available on mobile phone. Contact number of deployed engineer should be provided to Purchaser.		
3.2	Hub Engineer shall sign in Attendance Register available at Hub indicating In/Out time (He should also maintain attendance register for records).		
3.3	Operation of Hub shall be carried out 6 days per week (Monday to Saturday, from 9.00 hrs. to 17.30 hrs.).		

## Annexure-8 Price bid Format

**Table 1: L1 Evaluation Table**

Sr. No.	Description for Items	Unit Price (in Rs.)	Qty	Amount without taxes (in Rs.)	Taxes (in Rs.)	Total Amount with taxes (in Rs.)
<b>A</b>	<b>Hub</b>					
1	Hub Baseband System		1			
2	40 W Ku-band BUC (for Hub) with mounting accessories like Clamps, Waveguide, cables etc.		1			
3	Ku- Band PLL LNB for Hub with cables etc.		2			
4	Encoder		2			
5	Multiplexer		1			
6	L- Band Modulator		1			
7	L-Band Combiner		1			
8	Any other additional item required for I&C of Hub.		1 lot			
<b>B</b>	<b>LMS systems</b>					
1	LMS Server system		2			
2	Teacher PC		1			
<b>C</b>	<b>SITs</b>					
1	1.2m Ku-Band antenna with feed & Non Penetrating mount		36			
2	PLL LNB for SIT		36			
3	4 Watt Ku Band BUC for SIT		36			
4	IDU: Satellite modem compatible with Hub baseband		36			
5	Student PC		36			
6	USB based HD Webcam		36			
7	Wired Microphone with Phantom Power supply		36			
8	IFL (Tx/Rx) Cables with Connectors (1 pair) RG-6		36			
9	Miscellaneous items like Ballast weight, clamps, connectors, any other items required for I&C to be mentioned by vendor (1 lot)		36			
<b>D</b>	<b>ROTs</b>					
1	0.9m Ku-band antenna		50			

Sr. No.	Description for Items	Unit Price (in Rs.)	Qty	Amount without taxes (in Rs.)	Taxes (in Rs.)	Total Amount with taxes (in Rs.)
2	Ku-band LNBF		50			
3	DVB-S2 Set Top Box		550			
4	RG-6 type cable with connectors (minimum 30 meters' cable length to be provided).		550			
<b>E</b>	<b>Transportation</b>					
1	Transportation charges for items to be delivered at Hub		1			
2	Transportation charges for items to be delivered at remote sites		36			
<b>F</b>	<b>Services</b>					
1	Installation and Commissioning of Hub (BUC, LNB, Baseband, LMS server, Teacher PC etc.)		1			
2	Refurbishment of 3.8m Ku-Band antenna which includes painting, replacement of IFL cables, necessary RF items like flexible waveguide and any miscellaneous civil work.		1			
3	Installation and Commissioning of SITs		36			
4	Installation and Commissioning of ROTs		50			
4.1	Replacement of Set top box and recommissioning the ROT		500			
5	Studio integration of LMS systems		1			
6	CAMC charges for Hub for 4 years, after standard warranty. (charges to be mentioned year wise)					
6.1	CAMC of Hub for 1st Year after warranty		1			
6.2	CAMC of Hub for 2nd Year		1			
6.3	CAMC of Hub for 3rd Year		1			
6.4	CAMC of Hub for 4th Year		1			
7	CAMC charges for SITs for 4 years, after standard warranty.(charges to be mentioned year wise)					
7.1	CAMC of SITs 1st Year after warranty		36			

Sr. No.	Description for Items	Unit Price (in Rs.)	Qty	Amount without taxes (in Rs.)	Taxes (in Rs.)	Total Amount with taxes (in Rs.)
7.2	CAMC of SITs 2nd Year		36			
7.3	CAMC of SITs 3rd Year		36			
7.4	CAMC of SITs 4th Year		36			
G	Vendor to specify any other additional items/activities if required for I&C of Hub as well as SITs & ROTs		Vendor to suggest required quantities			
<b>L1 Evaluation total</b>						



**Table 2: Optional items** (Not to be considered for L1 Evaluation)

Vendor to provide quote for the following items. Purchaser may order these items as per the quantities required.

Sr. No.	Description for Items	Unit Price (in Rs.)
1	Display System (49" LED TV)	
2	HDMI cable (5 meter)	
3	Earthing at SIT site	
4	2 KVA UPS with 6 Nos SMF batteries of 45 AH	
5	1 KVA UPS with 3 Nos of SMF batteries of 65 AH	
6	CAMC charges for ROT for 4 years, after standard warranty. (charges to be mentioned year wise)	
6.1	CAMC of ROT 1st Year after warranty	
6.2	CAMC of ROT 2nd Year	
6.3	CAMC of ROT 3rd Year	
6.4	CAMC of ROT 4th Year	
7	Additional visit charges for remote locations (per visit)	

**Table 3: Rate Contract Items** (Not to be considered for L1 Evaluation)

Sr. No.	Description for Items	Unit Price (in Rs.)
<b>A</b>	<b>SIT Items</b>	
1	1.2m Ku-Band antenna with feed & Non Penetrating mount	
2	PLL LNB	
3	4 Watt Ku Band BUC	
4	IDU: Satellite modem compatible with Hub baseband	
<b>B</b>	<b>ROT Items</b>	
1	0.9m Ku-band antenna	
2	Ku-band LNBF	
3	DVB-S2 Set Top Box	
4	RG-6 type cable with connectors (30 meters)	

**Notes:**

1. The price bid in table 1 shall be considered for L1 evaluation. Purchaser may place order for less/more items/quantities.
2. Taxes extra as applicable for items mentioned in Optional items (Table : 2) and Rate Contract items (Table : 3)
3. Purchaser/User may procure the items mentioned in the purchase order separately also, as per the rates mentioned in the initial purchase order.

**Annexure-9**  
**Format of Installation certificate for SIT**

**Table-1: Details of SIT sites**

Sr. No	Description	(To be filled by Vendor)
1	Location & address of the SIT (In detail)	
2	Name of the site coordinator Contact details (1) Telephone Numbers (O) (2) Fax Number (O) (3) Mobile Numbers (M) (4) E-mail ids (if any)	
3	Name of the alternate site coordinator Contact details (1) Telephone Numbers (O) (2) Fax Number (O) (3) Mobile Numbers (M) (4) E-mail ids (if any)	
4	SIT Site Code	
5	Date of making SIT operational	

**Table-2: Typical List of SIT items**

Sr. No	Items	QTY	Make/ Model No	Serial No	Remark
1	1.2M Ku-Band Antenna with Feed, non-penetrating mount and reflector				
2	Ku-Band LNBC				
3	Ku-Band 4W BUC				
4	IFL cables-30Mt.				
5	IDU/Modem				
6	2 KVA UPS				
7	PC for SIT (Student PC)				
8	Webcam				
9	Wired Microphone with Phantom Power supply unit				
10	Display system (49" LED TV)				

**Table-3: Test measurements (typical)**

<b>Sr. No</b>	<b>Description</b>	<b>Remarks</b>
1	Eb/No	
2	Ping response to the Hub server	
3	Login status of SIT in the NMS	
4	LMS login status	
5	Print screen of audio/video interaction being carried out with teaching end via Hub	
6	Subjective audio & video quality received at SIT transmitted from Hub/Teaching end	
7	Subjective quality of audio & video interaction with teaching end	

The SIT is installed and commissioned and functional test carried out with Hub successfully.

**Remarks, if any**

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Signature  
Site Coordinator/Alternate Site coordinator  
Name  
Contact Details

Signature  
Vendor's Engineer  
Name  
Contact Details