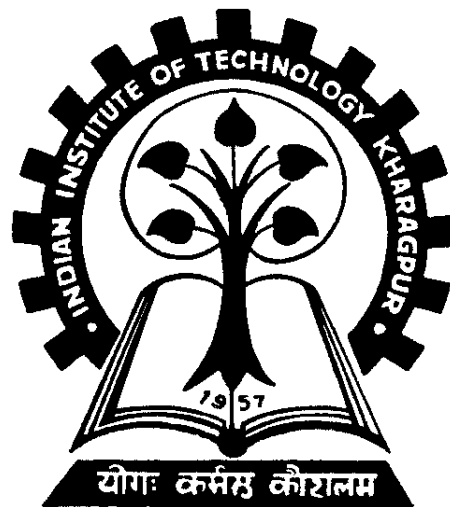


**TENDER DOCUMENT
FOR
SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF AIR
CONDITIONING SYSTEM FOR NEW SERVER ROOM AT
TAKSHASHILA BUILDING**

Tender No: IIT/CIC/NEW-SERVER-ROOM/AC/2017-18/26, Dated: 05.10.2017



**INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR
KHARAGPUR-721302
INDIA**

INVITATION FOR TENDER

Sealed tender offers are invited in TWO SEPARATE SEALED COVERS (Technical and Commercial offers) from eligible manufacturers/suppliers or their direct Indian agents for the supply, installation, testing & commissioning of **ductable split air conditioner of 12 TR capacity**.

Please send offers, ALONG WITH DESCRIPTIVE CATALOGUE/ BROCHURE. The validity of the bid should be at least four months (120 days) or more from the date of the opening of this tender. Please ensure that your quotation reaches not later than **30/10/2017 at 3:00 pm** at the following address:

To
Head
Computer & Informatics Centre
Indian Institute of Technology Kharagpur, Kharagpur – 721 302, West Bengal, India

Earnest money of **Rs. 10000/-** is to be deposited in the form of Account payee Demand Draft in favour of IIT Kharagpur, payable at Kharagpur, India. Any bid which is not accompanied with an EMD shall be summarily rejected. Earnest money deposited will be forfeited if the tenderer withdraws or amends its tender or impairs or derogates from the tender in any respect within the period of validity of its tender. No interest will be paid on the earnest money of the unsuccessful bidders.

Tender Reference	IIT/CIC/NEW-SERVER-ROOM/AC/2017-18/26, Dated: 05.10.2017
Price of Tender Document	NIL
Last Date and Time for submitting the tender document	30/10/2017 at 3:00 pm (Indian time)
Time and Date of Opening of Technical Bids	30/10/2017 at 3:00 pm (Indian time)
Place of Opening Tender	Computer & Informatics Centre Indian Institute of Technology Kharagpur Kharagpur – 721 302, West Bengal, India
Address for Communication	As stated above

Air conditioning of server rooms

GENERAL

Indian Institute of Technology intends air-conditioning of their New server room inside CIC.

The areas to be air-conditioned are being tabulated as under.

TABLE -1

<u>FLOOR:</u>	<u>SPACE</u>	<u>AIR-COND FLOOR AREA (SqFt)</u>	<u>SERVER LOAD (kW)</u>
Gr floor	New Server room	520 (Approx)	60

1.1 AIR-CONDITIONING

DESIGN CRITERIA

1.1.1 The basis of design shall be as under

	<u>Summer</u>	<u>Monsoon</u>
<u>Ambient conditions</u>		
	DBT – 105 °F (41 °C)	90 °F (32°C)
	WBT -- 83 °F (28 °C)	83 °F (28 °C)

Desired inside conditions to be within 71 ± 2 °F DBT (21.6 °C ± 1.1 °C) with 60% $\pm 5\%$ RH.

1.1.2 Lighting load considered: 1.0 watts per Sq Ft

Occupancy &
Equipment Load: 2 nos and 6 kW due to equipment load considered.

1.1.3 Ventilation air considered: 15 cfm / Person OR 1.0 Air Change / Hour, whichever is higher.

2. COOLING ESTIMATE

Estimated cooling loads are tabulated in table-2.

TABLE -2

PRELIMINARY COOLING ESTIMATE FOR NEW SERVER ROOM

SL NO.	FLOOR	SPACE	AC AREA (Sq Ft)	CONNECTED SERVER (kW)	CAPACITY (TR)	INDOOR CAPACITY (TR)	OUTDOOR CAPACITY (TR)
1.	Gr fl	New server Room	520	60*	9.0	4 x 3.0 TR ductable IDU (3W + 1S/BY)	4 x 3.0 TR ODU (3W + 1S/BY)

* 10 % of the connected server load (maximum) will be dissipated as heat

3. PLANT SELECTION

Air conditioning of New server room shall be done with air cooled ceiling suspended ductable split unit system with single/multiple scroll compressors. Out of the proposed **4 nos of 3.0 TR units**, at any point of time **1 unit will be working as stand-by**. To enable this there will be PDB cum control panel with timer setting by which units will be running alternatively in every 8 hrs.

Ductable indoor unit shall supply conditioned air through exposed, insulated GI duct (insulated with 13mm thick Al. foil faced nitrile rubber). Necessary volume control damper, non-return damper and grille shall be provided to meet the desired airflow. The indoor units shall be grouped together in common plenum and every unit shall have VCD & non return damper in fan mouth connection.

The outdoor unit to be placed adjacent wall of the server room as per the site conditions.

4. Energy Consumption at full load operation:

For 12TR Air cooled Ductable unit: 14 kW (approx.).

5. Scope not considered in AC system:

Under Civil Scope:

- Any type of civil work like foundation of equipment, any wall/false ceiling cutting and making same good etc.
- Making of drain pit/drain network if required. HVAC vendor will terminate the drain to the nearest drain point.

Under Electrical Scope:

- The incomer/ input power for the equipment as per proposed AC system.
- Shifting of any fan/light/ DB/switch board if required.

TEST READINGS

ITEM

TEST READINGS TO BE TAKEN AT THE TIME OF COMMISSIONING

AIR-COOLED OUTDOOR UNIT

Refrigerant pressures

Oil pressure

BHP consumed at 100% load

75%

50%

Ambient Temp

MOTOR

Voltage

Amperage

INDOOR UNITS

Entering/leaving Air Temperatures DBT/WBT

Air flow rates

SUPPLY & RETURN

AIR GRILLES

Air flow rates

Supply air DBT/WBT

SPACE

TEMPERATUTRES

DBT/WBT/RH

DETAILED TECHNICAL SPECIFICATIONS FOR DUCTABLE SPLIT AIR CONDITIONER

1.0 Scope

1.1 Supply Installation, testing and commissioning of the split air-conditioners meeting in all respects the intents of the specifications. The supply of the units shall comprise:

- a) Outdoor unit
- b) Indoor Unit
- c) Refrigerant piping connecting the two and drain piping
- d) Electrical wiring from the socket – outlet through the indoor and outdoor units with provision for local remote control.

2.0 Outdoor Unit

2.1 The outdoor condensing unit shall comprise of compressors, condenser coils, condenser fans, refrigerant connections and a casing. The compressors shall be hermetic type scroll compressor, resiliently mounted for quiet operation. The compressor drive shall be three phase motor, refrigerant cooled and shall have an inbuilt over load protector. The unit shall be capable of frequent starting and stopping without causing any over load.

2.2 The condenser coil shall be a copper tube with aluminium fins. The tube diameter shall be not less than 10mm with a wall thickness of 0.4 mm copper. Tube shall have aluminium fins adequately bonded through a process of mechanical expansion. The number of fins shall not exceed 520 per meter (13 per inch) and the number of rows in each case shall be for the specified output. The condenser fan shall be a multi-blade propeller type designed for low noise and directly driven by a totally enclosed fan motor. The refrigerant connections shall be brought out into plain stub ends.

2.3 All the components shall be enclosed in a casing formed from heavy gauge 1.6mm galvanized sheet steel totally rust inhibited.

3.0 Indoor Unit

3.1 The indoor unit shall be versatile and shall be capable of suspended from ceiling with simple site alteration. The unit shall consist of evaporator, fan and motor, evaporator coil, wherever shown in drawing additional drain tray, air filter, outlet for duct connection and controls shall be provided.

3.2 The evaporator fan shall be double inlet; double width centrifugal forward curved impellers statically and dynamically balanced. The impellers shall be mounted on either side of a double shafted 2/3 speed motor directly driving the fans. The fans shall be housed in a sheet steel a high impact ABS plastic enclosure which is acoustically treated. The evaporator coils shall be similar to the condenser coil and made of copper tube with aluminium fins and the refrigerant lines brought out to plain stub ends within the unit casing. All package air conditioner should have of the following controls.

High Pressure Cut Out.

Low Pressure Cut Out.

Protection for motor and Over load protector.

4.0 Installation

- 4.1 The outdoor unit shall be installed as decided by the Indian Institute of Technology- Kharagpur. The indoor unit shall be ceiling suspended as shown on drawings/ as per the requirement of client.
- 4.2 Refrigerant lines shall be inconspicuously and generally as shown in the drawings and as directed on site. The suction and liquid lines shall be bonded together and insulated with 6mm thick elastomeric tubing. All power wiring shall be drawn from the nearest socket outlet and shall include the control wiring, power wiring, on-off switch with speed controller.
- 4.3 All pipe sizing shall be done taking into account the length and rise.
- 4.4 A 12mm insulated drain pipe shall be provided as shown on the drawing and as directed on site.

5.0 Testing

- 5.1 The unit shall be tested for establishing the capacity and power consumption. Tests shall be carried out in accordance with IS 5141 – 1969 (revised up to date) computed results shall tally with specified capacity and power consumption figures furnished with the tender offer.
- 5.2 On completion of piping the system and the piping shall be tested using Nitrogen gas by raising the pressure to 1.5 times the working pressure and holding the test pressure for 3 hours.
- 5.3 Tests shall be carried out on
- a) the compressor and drive motor side
 - b) condenser side for heat rejection
 - c) Cooling coil for cooling capacity
 - d) Evaporator air volume
- 5.4 A test certificate from prototype factory tests will be acceptable.

6.0 Mode of Measurement

- 6.1 Each unit shall be measured as one item of work which shall consist of:
- i) Outdoor unit
 - j) Indoor unit
 - k) Refrigerant and drain piping (with insulation)
 - l) Electrical power control wiring, room thermostat and control panel
 - m) Refrigerant charge& oil
 - n) Erection
 - o) Commissioning and testing

7. **REFRIGERENT PIPING.**

7.1 Scope.

The scope of this section covers supply, installation of refrigerant piping & drain piping with insulation as specified here & as shown in the drawings.

7.2 Refrigerant copper Piping

- 16/18 gauge copper tubing shall be used to make connections to equipment's wherever required.
- Flare fittings e.g. flare nuts; tees, elbows, reducers etc. shall be of brass.
- The pipes and fittings shall be connected by means of welded joints. The connections to gauges, controls etc. (if any) shall be with soft copper tubing and flare fittings.
- Refrigerant piping routing shall be decided by Engineer – in – Charge.
- The refrigerant piping installation shall be as per drawing.

7.3 Drain Piping.

- All condensation drainage shall be pitched in the direction of flow to ensure adequate drainage with an adequate trap seal to prevent leakage / infiltration.
- Provide pitch of 20 mm per meter for a smooth drainage of condensate.
- Condensate drain piping fixing shall be as per drawing.
- The routing of Drain Piping shall be decided by Architect/ Engineer – in – Charge.
- The material for the drain pipe is GI with insulation.
- Drain piping supporting shall be as per drawing.

7.4 Suction Line Insulation.

The Suction Line shall be insulated with 19mm thick. Nitrile Rubber Insulation covered with aluminium foil (As per Specified with K Value of 0.027-0.029 K Cal/Hr. M Deg C at 0-16 Deg C)

7.5 Drain Piping Insulation.

The drain pipes shall be insulated with 25mm thick TF quality EPS insulation (density 24 kg/m³) finished with 26 G Al. cladding.

7.6 Mode of Measurement.

- Refrigerant pipes with insulation shall be in linear measure along the centre line of the pipe including accessories, supports etc and paid for per RMT.
- Condensate drain pipes with insulation shall be in linear measure along the centre line of the pipe including accessories, supports etc and paid for per RMT.

8. **LIST OF APPROVED MAKES OF EQUIPMENTS**

1	Dx type ductable split Units	DAIKIN / BLUE STAR / TOSHIBA/ VOLTAS/ CARRIER
2.	GI Sheet	TATA/ SAIL/ JINDAL
3.	Duct Insulation	K flex/ A flex/ Armacell

TECHNICAL DATA SHEET

Contractor should furnish technical data of the equipment and accessories offered by him as per the scheme and bill of quantities. Some sample technical data sheets are enclosed for the contractor to understand the expected technical data. Similarly the technical data for all other equipment are supposed to be enclosed with offer. Manufacturer's printed data sheet for all components should be enclosed along with technical data sheet.

Sl.No.	Description	Unit	Condition of services
	Indoor Unit / Evaporator Unit		
1	Unit no./model no.		
2	Manufacturer		
3	Operating weight	kG	
4	Overall dimension	mtr	
5	Dimension of coil	mtr	
6	Finned area	Sq. m	
7	No. of rows	Nos.	
8	Fins per cm	Nos.	
9	Tube Dia	mm	
10	Thickness of tubes	mm	
11	Fin Material		
12	Air quantity	m ³ /hr	
13	Fan outlet velocity	m/s	
14	No. of Blower	Nos.	
15	Dia. of Blower	mm	
16	Fan speed	RPM	
17	Total static pressure	mm WG	
18	Motor rating	HP	
19	Type of air filters / Thickness / No		

Sl.No.	Description	Unit	Condition of services
	Type & Make of Electrical items		
1	Electric starters		
2	Electric switches		

Sl.No.	Description	Unit	Condition of services
	Condenser Fan		
1	Type		
2	Size (Dia)	mm	
3	Air quantity	cfm	
4	BHP		
5	Offered motor HP		

Sl.No.	Description	Unit	Condition of services
	Compressor		
1	Type : Screw / Rotary / Scroll		
2	Make		
3	Model		
4	Refrigerant		

Sl.No.	Description	Unit	Condition of services
	Condenser		
1	Type		
2	Make		
3	Model		
4	Tube Material		
5	Tube thickness	mm	
6	Tube diameter	mm	
7	No. of tubes	Nos.	
8	Type of tubes / Finning		
9	Design Pressure		
10	Test Pressure		

GENERAL TERMS & CONDITIONS

PLEASE SPECIFICALLY INDICATE THE FOLLOWING POINTS IN YOUR QUOTATIONS AND COMPLY THE TERMS AS MENTIONED HEREUNDER:-

1. TENDERS ARE INVITED COMPLYING THE REQUIREMENT FOR TENDER AS DETAILED IN THE TENDER SPECIFICATION TO BE SUBMITTED IN THE COMPANY'S / FIRM'S LETTERHEAD NEATLY PRINTED / TYPED DULY SIGNED BY AUTHORIZED PERSON WITH THE SEAL OF THE BIDDERS. ALL ENVELOPS CONTAINING THE TENDER SHOULD BE PROPERLY SEALED. SEPARATE ENVELOPS SHOULD BE USED FOR TECHNICAL AND PRICE BID AND INDICATION TO THEIR EFFECT MAY PLEASE BE SUPERSCRIBED ON THE ENVELOP.

THE FOLLOWING DOCUMENTS ARE REQUIRED FROM THE INDIAN AGENTS OF FOREIGN FIRMS:

- 1.1 FOREIGN PRINCIPAL'S PROFORMA INVOICE INDICATING THE COMMISSION PAYABLE TO THE INDIAN AGENT AND NATURE OF AFTER SALES SERVICE TO BE RENDERED BY THE INDIAN AGENT.
- 1.2 COPY OF THE AGENCY AGREEMENT WITH THE FOREIGN PRINCIPAL INDICATING THE NATURE OF AFTER SALES SERVICES, PRECISE RELATIONSHIP BETWEEN THEM AND THEIR MUTUAL INTEREST IN THE BUSINESS.
2. TECHNICAL CATALOGUE/LEAFLET SHOULD BE ENCLOSED WITHOUT FAIL. PROVIDE COMPLIANCE STATEMENT WITH RESPECT TO THE TECHNICAL SPECIFICATIONS MENTIONED ABOVE.
3. PLEASE CONFIRM WHETHER YOU ARE AUTHORISED TO QUOTE ON BEHALF OF YOUR PRINCIPALS AND IF SO, PLEASE ENCLOSE A COPY OF SUCH AUTHORISATION WITH YOUR QUOTATION.
4. **PRICE BIDS FOR INDIAN FIRMS:** PRICES ARE TO BE QUOTED ON F.O.R., IIT KHARAGPUR, ON DOOR DELIVERY BASIS. **ALL ITEMS SHALL BE INCLUSIVE OF DUTIES AND TAXES.**
5. **PERIOD OF VALIDITY:** BIDS SHALL REMAIN VALID FOR ACCEPTANCE FOR A PERIOD OF 120 DAYS FROM THE DATE OF OPENING.
6. INDIAN AGENTS ADDRESS AND PERCENTAGE OF AGENCY COMMISSION INCLUDED IN ABOVE F.O.B./EX-WORKS PRICE. (THIS WILL BE PAID TO THE INDIAN AGENTS IN INDIAN RUPEES ONLY AND NOT IN **FE**). PLEASE ENCLOSE COPY OF AGENCY AGREEMENT ENTERED INTO WITH YOUR PRINCIPALS INDICATING THE NATURE OF AFTER SALES SERVICES OF INDIAN AGENTS, PRECISE RELATIONSHIP & MUTUAL INTEREST IN THE BUSINESS.
7. **MEASUREMENTS/WEIGHT:** NETT/GROSS OF THE CONSIGNMENT. IN CASE OF AN ORDER, YOU SHALL USE AIR WORTHY PACKAGE (AS APPLICABLE) DULY CERTIFIED WITH DOCUMENTS – PLYTO – SANITARY CERTIFICATE (AS PER QUARANTINE ORDER 2003).
8. **SCOPE OF SUPPLY:** SHOULD INCLUDE FREE INSTALLATION AND TESTING & COMMISSIONING
9. **PAYMENT TERMS**
 - a. 80% towards supply of materials at site.
 - b. 20% towards installation.
 - c. 5% towards successful commissioning and handing over with all test reports and as-built drawings approved by IIT- Kharagpur.
 - d. 5% towards retention amount till the completion of Defects Liability Period.

B) ENSURE MENTIONING

- i) BANK DETAILS OF THE BENEFICIARY, GST NO, VAT NO., SERVICE TAX NO. AND PAN NUMBER
 - ii) FULL NAME AND ADDRESS OF THE BENEFICIARY ON WHOM ORDER HAS TO BE PLACED
10. WHETHER ANY EXPORT LICENCE IS REQUIRED FROM YOUR GOVERNMENT, IF SO, PLEASE CONFIRM WITH DETAILS.
 11. COUNTRY OF ORIGIN OF THE GOODS IS TO BE MENTIONED.
 12. THE INSTITUTE SHALL PROVIDE THE CONCESSIONAL CUSTOMS DUTY AND EXCISE DUTY EXEMPTION CERTIFICATE AS PER GOVT. NOTIFICATION NO. 51/96 CUSTOMS DATED: 23.07.1996 AND CENTRAL EXCISE DUTY EXCEMPTION IN TERMS OF GOVT. NOTOFICATION NO. 10/97 – CENTRAL EXCISE DATED: 01.03.1997 AS AMENDED FROM TIME TO TIME.
 13. **Time of Completion of project: 12 weeks from the LOI/WO**
 14. **LIQUIDATED DAMAGES:** THE STORES SHOULD BE DELIVERED / DISPATCHED TO DESTINATION AND READY FOR OPERATION NOT LATER THAN THE DELIVERY DATE SPECIFIED. IT THE SUPPLIER FAILS TO DELIVER ANY OR ALL THE STORES OR PERFORM THE SERVICE BY THE SPECIFIED DATE, LIQUIDATED DAMAGES AT 1% PER WEEK OR PART THEREOF IN RESPECT OF THE VALUE OF STORES WILL BE DEDUCTED FROM THE CONTRACT PRICE SUBJECT TO A MAXIMUM OF 5%. ALTERNATIVELY, THE ORDER WILL BE CANCELLED AND THE UNDELIVERED STORES PURCHASED FROM ELSEWHERE AT THE RISK AND EXPENSE OF SUPPLIER.
 15. **PATENT RIGHTS:** THE SUPPLIER SHALL INDEMNIFY THE PURCHASE AGAINST ALL THIRD PARTY CLAIMS OF INFRINGEMENT OF PATENT, TRADEMARK OR INDUSTRIAL DESIGN RIGHTS ARISING FROM USE OF THE GOODS OR ANY PART THEREOF IN INDIA.
 16. ONLY THOSE BIDDERS WHO'S BIDS HAVE BEEN TECHNICALLY FOUND ACCEPTABLE WILL ONLY BE INVITED FOR PARTICIPATION IN THE PRICE BID.
 17. THOSE BIDDERS WHO DO NOT RECEIVE ANY COMMUNICATION FOR PARTICIPATION IN PRICE BID OPENING MEETING MAY PRESUME THAT THEIR BID HAS NOT BEEN ACCEPTED BY THE INSTITUTE.
 18. CONDITIONAL OFFER WILL NOT BE ACCEPTED.
 19. LATE TENDERS I.E. TENDER RECEIVED AFTER THE DUE DATE AND TIME OF SUBMISSION AS MENTIONED ABOVE SHALL NOT BE ACCEPTED.
 20. BIDDERS TO ENCLOSE THE FOLLOWING DOCUMENTS:-
 - A) CURRENT INCOME TAX AND SALES TAX CLEARANCE CERTIFICATES (VAT No.), SERVICE TAX NO. AND PAN NO.
 - B) BANKER'S SOLVENCY CERTIFICATE
 - C) SUMMARY OF AUDITED STATEMENT OF ACCOUNTS FOR THE LAST THREE YEARS TO BE ENCLOSED AND FINANCIAL HIGHLIGHTS AND THE KEY PERFORMANCE DURING THE LAST THREE QUARTERS TO BE ENCLOSED AS PER FORMAT:-

COMPANY'S KEY PERFORMANCE

DESCRIPTION	JAN. TO MARCH	APRIL TO JUNE	JULY TO SEPT.
GROSS REVENUE			
PROFIT BEFORE TAX			
PROFIT AFTER TAX			
RETURN ON INVESTED			
CAPITAL (ROIC)			

D) CUSTOMER SATISFACTION CERTIFICATE FROM ONE SUCH ORGANIZATION IS TO BE ATTACHED WITH THE TECHNICAL BID AND PRICE BID.

E) NAME AND ADDRESS OF MINIMUM THREE CLIENTS TO WHOM SUCH EQUIPMENT HAVE BEEN SUPPLIED SHOULD BE MENTIONED.

WARRANTY / GUARANTEE: The plant and associated accessories are to be guaranteed for trouble free operation, maintenance and service. The warranty should cover defects due to faulty manufacture, workmanship or material for 3 year from the date of commissioning. Any manufacturing defect found during this period shall be repaired/ replaced by the supplier free of charge as per terms and conditions embodied in the tender papers and agreement executed with IIT Kharagpur. The security deposit shall be returned to the tenderer at the end of the guarantee period of 3 year.

During the guarantee period the supplier may state clearly the details of the periodic checks to be carried out by them on the whole plant for trouble free operation.

21. THE INSTITUTE DOES NOT BIND ITSELF TO OFFER ANY EXPLANATION TO THOSE BIDDERS WHO'S TECHNICAL BID HAS NOT BEEN FOUND ACCEPTABLE BY THE EVALUATION COMMITTEE OF THE INSTITUTE.

22. ALL TENDERS (UNLESS OTHERWISE SPECIFIED) ARE TO BE SUBMITTED / HANDED OVER TO **Head, CIC, INDIAN INSTITUTE OF TECHNOLOGY, KHARAGPUR - 721 302** AND ACKNOWLEDGEMENT TO BE OBTAINED.

IMPORTANT

1. The competent authority of IIT Kharagpur may accept or reject any or all the bids in part or in full without assigning any reason and does not bind itself to accept the lowest bid. The Institute at its discretion may change the quantity / upgrade the criteria / drop any item or part thereof at any time before placing the Purchase Order.
2. Promptly make arrangements for repair and / or replacement of any damaged item (s) irrespective of settlement of claim.
3. In case of any dispute, the decision of the Institute authority shall be final and binding on the bidders.
4. For any query pertaining to this bid document correspondence may be addressed to **Head, CIC** at the address mentioned above.

LAST DATE FOR SUBMISSION OF SEALED BIDS: 30.10.2017 at 3:00 PM

- 1) Please Note that the Institute remains closed during Saturdays & Sundays and all specified government holidays.
 - 2) Fax, e-mail Tender will not be accepted.
 - 3) The General Terms and Conditions as stated above relate to supply of stores / equipment /assets etc. and for specific service other terms and conditions of the Institute will apply.
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