

**INVITATION FOR TENDER FOR SUPPLY OF  
REFRIGERATION AND AIR-CONDITIONING LAB EQUIPMENTS**

Total Numbers of pages: 08

Tender Document Cost: -----/-

To

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Sub: Invitation for tender for supply of equipments/instruments.

Dear Sir (s),

You are invited to submit your most competitive tender for the Refrigeration and Air-conditioning Lab equipments with the enclosed terms & conditions. The brief information regarding the tender is:

- **TENDER FLOATING DATE** : 30.01.2016
- **TENDER SUBMISSION CLOSING DATE & TIME**: 29-02-2016, 3 P.M.
- **TENDER OPENING DATE & TIME** : 29-02-2016, 3. 30 P.M
- **VENUE FOR TENDER SUBMISSION & OPENING** : Submission: Department of Mechanical Engineering, GJUS&T, Hisar Opening: Chairman Office, Department of Mechanical Engineering, GJUS&T, Hisar
- **PRE-BID CONFERENCE (IF ANY)** : Nil
- **TENDER DOCUMENT COST** : Rs. 300/-
- **TWO ENVELOPE BID** : The Tender is to be submitted on two envelope bid pattern i.e. "Technical Bid" & "Price / Commercial Bid" in separately sealed envelopes. Both of these envelopes should be put in and sealed in another envelope addressed to Chairman, Department of Mechanical Engineering, Guru Jambheshwar University of Science & Technology, Hisar-125001 (Haryana), India and super-scribed in bold as "TENDER FOR SUPPLY OF "Refrigeration and Air-conditioning Lab". The "Technical bid" should mention only the technical details of the items/equipments. Price per unit be mentioned only in the "Price/commercial bid format".

Enclosures: As above.

**TENDER DOCUMENT FOR REFRIGERATION AND AIR-CONDITIONING LAB EQUIPMENTS**

**GURU JAMBHESHWAR UNIVERSITY OF SCIENCE & TECHNOLOGY, HISAR**

Brief Description of the Equipment	Technical Specifications	Qty.	Cost in Rs.
<p><b>AIR CONDITIONER TEST RIG (DUCT TYPE)</b></p>	<p><b><u>EXPERIMENTS:-</u></b></p> <ul style="list-style-type: none"> <li>• To determine COP of unit.</li> <li>• To study the humidification, heating, cooling and dehumidification process and plot them on psychrometric charts.</li> <li>• To determine by pass factor of cooling coil and heating coil and plot them on psychrometric charts on different inlet conditions.</li> <li>• To determine sensible heat factor of air on re-circulated air conditioner.</li> </ul> <p><b>Compressor</b> 1 ton Hermetically sealed compressor (reputed make)</p> <p><b>Condenser</b> Fined and tube type air cooled condenser with fan</p> <p><b>Evaporator</b> Fins and copper tube type cooling coil of suitable capacity</p> <p><b>Refrigeration</b> Freon R-22</p> <p><b>Fan Blower</b> Driven by 1/10 H.P. (Approx.) motor (reputed make)</p> <p><b>Refrigeration Control Panel</b></p> <ol style="list-style-type: none"> <li>a). Capillary tube devices and thermostatic expansion valve</li> <li>b). Filter cum Drier</li> <li>c). Digital Suction pressure gauge for Low Pressure measurement</li> <li>d). Digital Discharge pressure gauge for High Pressure measurement</li> <li>e) Steam Boiler</li> <li>f) Rota meter for flow measurement</li> <li>g) Digital anemometer for air velocity measurement</li> <li>h) pre and re heater provided in the duct</li> <li>i) re-circulated air arrangement in the duct for measurement sensible factor of air.</li> <li>J) LP HP cut out</li> <li>k) Solenoid valve for selection for expansion device.</li> <li>L) Digital Hygrometer</li> </ol> <p><b>Electrical Control Panel</b> Main Switch, Digital Voltmeter, Digital Amp. Meter and Energy meter for Compressor input</p> <p><b>Digital Temp. Indicator</b> (-)50deg to 199.9degC with multi channel</p> <p><b>Temp sensor</b> RTD pt-100(-50To 199.9 deg C )</p> <p><b>MS Stand</b> The unit shall be assembled on Sturdy fabricated MS frame for housing the duct, instrumentation and controls</p> <p><b>Power Supply</b> Single Phase 220 Volts 50Hz. AC Supply with automatic voltage stabilizer</p> <p><b>Manual</b></p> <ul style="list-style-type: none"> <li>• Operation manual to be provided along with the equipment</li> <li>• The control panel should be metallic powder coated with caster wheels (high quality).</li> <li>• The duct should be of stainless steel</li> </ul>	01	

Brief Description of the Equipment	Technical Specifications	Qty.	Cost in Rs.
<b>VAPOUR ABSORPTION REFRIGERATION TEST RIG</b>	<p><b>EXPERIMENTS:-</b> To determine the Coefficient of performance of vapor absorption Refrigerator.</p> <p><b>Refrigerator</b> 40 Liters</p> <p><b>Temp. Range</b> 0°C – 8°C</p> <p><b>Heating</b> Externally Heated by Electric Resistance</p> <p><b>Evaporator</b> Coil Type Evaporator</p> <p><b>Voltage Input</b> 65 watts</p> <p><b>Control Panel</b></p> <ol style="list-style-type: none"> <li>a) Main Switch</li> <li>b) Digital Voltmeter</li> <li>c) Digital Ammeter</li> <li>d) Digital Temp. Indicator with Selector Switch</li> <li>e) Temperature Sensors – (PT-100 type)</li> </ol> <p><b>MS Stand</b> The unit shall be assembled on heavy duty Iron Base</p> <p><b>Power Supply</b> Single Phase 220 Volts 50Hz. AC Supply</p> <p><b>Manual</b></p> <ul style="list-style-type: none"> <li>• Operation and maintenance manual to be provided along with the equipment</li> <li>• The control panel should be metallic powder coated with caster wheels (high quality)</li> </ul>	01	

Brief Description of the Equipment	Technical Specifications	Qty.	Cost in Rs.
<b>VAPOUR COMPRESSOR REFRIGERATION CUM WATER HEAT PUMP TEST RIG</b>	<p><b>EXPERIMENTS:-</b></p> <ul style="list-style-type: none"> <li>To determine COP of vapour compression refrigeration unit</li> <li>To draw P-H and T-S diagram</li> <li>To determine COP of heat pump</li> </ul> <p><b>Compressor</b> ½ ton Hermetically sealed reciprocating compressor (reputed make)</p> <p><b>Condenser</b> Air cooled condenser with cooling fan.</p> <p><b>Evaporator Coil</b> Suitable for above compressor immersed in water tank of stainless steel</p> <p><b>Refrigeration</b> Freon R-134A</p> <p><b>Fan Blower</b> 1/10 hp (approx) motor Standard make</p> <p><b>Refrigeration Control Panel</b></p> <ol style="list-style-type: none"> <li>Capillary tube devices and Thermostatic Expansion Valve</li> <li>Digital Suction pressure gauge for Low Pressure measurement</li> <li>Digital Discharge pressure gauge for High Pressure measurement</li> <li>Filter cum Drier</li> <li>Rota meter for flow measurement</li> <li>LP HP cut out</li> <li>Solenoid valve for selection for expansion device.</li> <li>Reverse valve for operation water heat pump.</li> </ol> <p><b>Electrical Control Panel</b> Main Switch, Digital Voltmeter, Digital Ampere Meter and Energy meter for Compressor input</p> <p><b>Digital Temp indicator</b> -50 to 199.9 deg C with multi channel</p> <p><b>Temperature Sensor</b> RTD pt-100(-50To 199.9 deg C )</p> <p><b>Power Supply</b> Single Phase 220 Volts 50Hz. AC Supply</p> <p><b>Manual</b></p> <ul style="list-style-type: none"> <li>Operation manual to be provided along with the equipment</li> <li>The control panel should be metallic powder coated with caster wheels (high quality).The duct should be of stainless steel.</li> </ul>	01	

Brief Description of the Equipment	Technical Specifications	Qty.	Cost in Rs.
<b>CUT SECTION ACTUAL MODEL OF HERMETICALLY SEALED ROTARY COMPRESSOR 1TON AND HERMETICALLY SEALED RECIPROCATING COMPRESSOR 1TON</b>	Cut Section Actual Model of Hermetically Sealed Rotary Compressor 1ton And Hermetically Sealed Reciprocating Compressor 1ton	01	

Brief Description of the Equipment	Technical Specifications	Qty.	Cost in Rs.
<b>REFRIGERATION &amp; AIR-CONDITIONING ACTUAL SECTIONAL CUT MODEL BOARD</b>	<p>The following controls and components shall be provided on metallic powder coated panel:</p> <ol style="list-style-type: none"> <li>1. Capillary tube expansion device</li> <li>2. Hand expansion valve</li> <li>3. Thermostatic expansion valve</li> <li>4. Change over switch</li> <li>5. Pressure relief valve</li> <li>6. Liquid line indicator</li> <li>7. Hand shut off valve</li> <li>8. Relay package assembly</li> <li>9. Filter drier</li> <li>10. Needle valve</li> <li>11. Dial type thermometer</li> <li>12. Solenoid valve</li> <li>13. Suction service valve</li> <li>14. Discharge service valve</li> <li>15. Automatic thermostat</li> <li>16. High pressure cut out</li> <li>17. Low pressure cut out</li> <li>18. Butterfly valve</li> <li>19. Y-type strainer</li> <li>20. Check valve/non return valve</li> <li>21. Suction pressure gauge</li> <li>22. Discharge pressure gauge</li> <li>23. Globe valve</li> <li>24. Heat exchanger</li> <li>25. Oil separator</li> <li>26. Relay contactor</li> <li>27. Crank case heater</li> <li>28. Accumulator</li> <li>29. Current type relay (4 no's)</li> <li>30. Oil failure cut out</li> <li>31. Start capacitor</li> <li>32. Running capacitor</li> <li>33. Power capacitor</li> <li>34. Wet and dry-bulb thermometer</li> <li>35. Hygrometer</li> <li>36. Water thermometer</li> <li>37. Humidistat</li> <li>38. Fins and tube type heater</li> <li>39. Air pressure cut out</li> <li>40. Water pressure gauge</li> <li>41. Miniature circuit breaker</li> <li>42. Oil pressure gauge</li> <li>43. Ball valve</li> <li>44. Water spray nozzle</li> <li>45. Single phase preventer</li> <li>46. Receiver valve</li> <li>47. Overload protector</li> <li>48. Gate valve</li> <li>49. Motor starter</li> <li>50. Psychrometer</li> <li>51. Vacuum gauge</li> <li>52. Reverse valve</li> </ol>	01(each)	

## STANDARD TERMS AND CONDITIONS GOVERNING THE TENDERS

1. The tender envelope should be addressed to Chairman, Department of Mechanical Engineering, Guru Jambheshwar University Of Science & Technology, Hisar 125001 and the envelope must be super scribed “Tender for Supply of RAC Lab.”
2. The Tender must be signed by authorized signatory of the bidding firm/company on each page, along with seal and proof of authorization.
3. The supplier is advised not to alter the specifications and not to mention anything on the Tender form, except cost, signature with seal, otherwise his Tender will be considered as rejected.
4. The Tender should be quoted as FOR GJUS&T and in the Indian currency. The transient insurance and freight charges, if any, will be borne by the supplier.
5. The supply order(s) shall be executed within the time specified in the supply order which may be extended by the Vice-Chancellor on the application of the contractor on the reasonable grounds. In the event of the contractor failing to supply the material with in time, he shall be liable to pay as penalty an amount equal to 1% or such smaller amount as the Vice-Chancellor may decide the said amount of the contract, for every day that the quantity remains in complete, provided that the entire amount of penalty shall not exceed 10% of the total amount of contract. An appeal against these orders shall however, lie to the Vice-Chancellor whose decision shall be final. In case the contractor backs out the supply, the earnest money deposited by him shall be forfeited besides any other action as may be considered necessary by the Vice-Chancellor.
6. Incomplete Tender such as unsigned Tender, late submitted Tender, conditional Tender, not confirming to the eligibility criteria and Technical specification or with any vague term such as ‘**Extra as applicable**’ will be considered as rejected.
7. The goods, which are not according to the specifications and are, thus, not accepted shall be lifted by the supplier at his/her own cost.
8. The quantity shall be subject to increase or decrease as the case may be.
9. The delivery of the material will be given to the respective department. However, the material will be accepted subject to the approval of the inspection committee.
10. The detailed literature/catalogue of the quoted instrument and accessories should be attached with the tender. The specifications claimed by the firm should be clearly mentioned in the literature/catalogue.
11. Taxes/Excise duty/Custom duty etc. if any, will be paid extra, as applicable under Government rules, if so quoted by the Supplier/Contractor in the tender subject to the certificate in the bill of costs as follows. However, wherever exemption from duty (excise/custom) is applicable, the university will provide exemption certificate, along with supply/purchase order.
12. The University reserves the right to reject any or all offers without assigning any reason.
13. The material should be packed in a strong case so as to avoid any damage, theft or pilferage in the transit, in which case the responsibility shall be that of the supplier.
14. Other terms and conditions are specified in the notice inviting tenders.
15. The successful bidders will be required to submit a performance warranty in form of bank guarantee equal to 10 % of the purchase order for the warranty period of the Equipments.
16. The supply is to be made within 45 days of the dispatch of the supply order if otherwise not mentioned in the Tender document by the purchaser. The payment will be made within 30 days of the on site training imparted by the firm to GJUS&T staff, satisfactory installation and inspection by the committee appointed by the university.

17. The earnest money of Rs. 20,000 /- in the form of bank draft payable at Hisar and drawn in favour of the Registrar, Guru Jambheshwar University of Science & Technology, Hisar will be required to be remitted with the tenders.
18. The cost of tender is Rs. 300/- per tender document.
19. All disputes shall be subject to Hisar jurisdiction.

### **SPECIAL TERMS AND CONDITIONS GOVERNING THE TENDERS**

1. Eligibility Criteria of Vendor/Supplier/Manufacturer
- If the quote is through a dealer then it should have an authorization certificate from the manufacturer.
  - The supplier can supply the machines/Equipments of the manufacturing company which is in the field of manufacturing of same type of machines/Equipments for the last two years.
  - Detailed Client list of last two years with address and telephone no. is required.
  - The list of Machineries/Equipments and other expertise available at manufacturing work along with, the details of the expert manpower available.
- Note: Necessary Documents are required to be attached with the Tender Document*
2. The machine should be supplied in fully packed condition at Mechanical Engineering Workshop, Guru Jambheshwar University of Science & Technology, Hisar. **Loading and Unloading will be done by the supplier at his own cost.**
3. The supplier is required to install the machines in the Deptt. of Mechanical Engineering of G.J.U.S&T and for functional demonstration purpose the supplier is required to use his own requisite material.
4. First fill of all oils and lubricants/coolants will be done by the supplier.
5. All types of consumables, tools, foundation bolts etc. will be provided by the supplier at the time of installation, commissioning & inspection of the machines/engines.
6. The supplier is required to fill the price of the machines only in the format of the tender supplied by the University. **The tender format in any other form will not be considered.**
7. The Tender would be evaluated collectively for all items; therefore the supplier is required to quote the rates for all items mentioned in the Tender Document. If the rates are not quoted for all the items mentioned in the tender document, then his offer will be considered as rejected.
8. The total cost of Tender should include basic price of machines and all admissible taxes should be clearly mentioned in figures and the price should be quoted in the relevant columns.
9. Warranty/guarantee: - Three years from the date of inspection of the machines by the university.
10. If the tender document is downloaded from the university website, then the bank draft of Rs. 300/- in favour of Registrar, GJUS&T, Hisar) as the tender fee is to be submitted along with tender documents.

Total Basic Cost of All The Equipments	
Sales Tax/Vat(if any) @ _____%	
Custom Duty /Excise Duty(If Any) @ _____	
Gross Total Cost of All The Equipments (Including All The Taxes)	

We agree to supply the above Equipments in accordance with the technical specifications & above said terms and conditions for a total price of Rs. \_\_\_\_\_ (amount in figures) \_\_\_\_\_ (Amount in words) with in the period specified in the Invitation for Tender. We also confirm that the normal commercial warrantee/guarantee of 3 years shall apply to the offered Equipments.

Signature of the Supplier  
(With Seal)

Correspondence address of the company  
With phone, Fax, E-mail and  
Name & address of contact person.

Place:-

Date: -