MALAVIYA NATIONAL INSTITUTE OF TECHNOLOGY JAIPUR

No. F5(882)ST/MNIT/CHEM/2019 **Phone : 0141-2713312,2713352**

NOTICE INVITING QUOTATIONS

Registrar MNIT, JLN Marg, Jaipur invites sealed tenders for the supply of **"Equipments"** for **Chemical Engineering Department** of this Institute in **Two Bid System (Technical & Financial bids in separate envelop)** as per schedule given below.

Event	Date & Time
Download of Tender	13.02.2020
Pre-Bid Meeting Date & Time	21.02.2020 by 2.00 PM
Bid Submission Last Date& Time	05.03.2020 by 2.00 PM
Technical Bid Opening Date & Time	05.03.2020 at 3.00 PM
Financial Bid Opening	Will be intimated later on
Tender Fees	Rs. 500.00 (Non-refundable) in the name of The Registrar, MNIT and payable at Jaipur
Earnest Money	**(As per annexure –E)** in the name of The Registrar, MNIT and payable at Jaipur **(Kindly attached the RTGS details with cancelled cheque along with the Earnest Money)**

Quotation must be enclosed in a properly sealed envelope address to the MNIT, Jaipur with kind attention to **Deputy Registrar (S&P), MNIT, Jawahar Lal Nehru Marg, Jaipur -302017** (E-mail address storepurchase@mnit.ac.in) by designation and not by name. The quotations must be super scribed "Quotations for the supply of Equipments ---------- as called for in Tender Notice No. ---------- dated _____"DUE ON--------- AT ----------AM/PM. The Quotation must reach on or before -------AM/ PM on or before the due date and time mentioned in the tender notice/tender document. The documents must be dropped in the tender box available in Central Store during office hours (9.30am to 6.00pm) on all working days. Bids delivered to any other place or any individual shall not be considered as valid document. Quotations sent by e-mail will not be considered valid. The complete Tender document can be viewed and downloaded only from the website (www.mnit.ac.in) and CPPP site https://eprocure.gov.in/epublish/app during the tender period.

GENERAL TERMS & CONDITIONS

1. **THE RATES QUOTED SHOULD BE F.O.R. JAIPUR inclusive of all charges related to transportation from your end to MNIT, Jaipur in Indian rupees. For imported items, the rates are to be quoted CIF(Cost, Insurance & Freight) Delhi only in freely convertible foreign currencies. In case the rates are quoted CIF (Cost, Insurance & Freight) New Delhi, then it will be the responsibility of the supplier to intimate us well in advance prior to dispatch and submission of all the relevant documents in time which will be required in clearing the consignment from Custom. If, there is delay in sending the documents and demurrage is imposed, then it will be in the account of foreign supplier. Kindly note that if any amendment is required in LC, after its establishment, the Bank Charges in this respect will be in the account of beneficiary only.** Bid shall always be both in the figures and words. The words "No quotations" should be written across any or all of the items in the schedule for which a tender does not wish to tender.

2. As far as possible, bid should be given for goods of India manufacture which are readily available. Foreign goods quoted and proposed to be supplied should be covered by normal import quota of the dealer. This institute is exempted from payment of custom duty.

3. Detailed specifications and "make" of each item should be clearly given supported by the illustrated pamphlets wherever possible. Bid without specifying the make and other particulars may be rejected. The accessories included in the equipment should also be clearly mentioned.

4. Losses or damage in transit will be in to the account of the supplier in case of rates **F.O.R. JAIPUR.** The supplier may, if he so desires, get the goods insured

5. The payment for the ordered items would be made after the articles have been received, found in order and its successful installation.Payment will be made by RTGS to indigenous suppliers. Kindly send the RTGS details and cancelled cheque along with the Invoice.**The payment to foreign supplier will be made through FDD/Wire Transfer OR Letter of Credit as the case may be. However 90 percent payment will be released after receipt of items and remaining 10 present after its successfully installation**

6. Your rates should be valid at least for three months (minimum) from the last date of opening of bid.

7. All legal proceedings, if necessity arises to institute may be any of the parties (Institute or Contractor/Supplier) shall have to be lodged in the courts situated at Jaipur and not elsewhere.

8. The institute is not bound to accept the lowest tender and may reject any tender or any part of the tender without giving any justification for such an action.

9. (a) The Penalty Clause is as under:-

If the seller fails to deliver any or all of the Goods/Services within the original /re-fixed delivery period specified in the Purchase Order, this Institute will be entitled to deduct/recover the Liquidated Damages for the delay at the following percentage:

(i)	Delay up to one month		1%
(ii)	Delay exceeding one month but not exceeding two month		2%
(iii)	Delay exceeding two month but not exceeding three month		5%
(iv)	Delay exceeding three month		5% for each month and part there of subject tomaximum 10%

(b) In case of failure to supply the goods within the prescribed time and in accordance with the specifications give in the Quotations, the institute shall be free to cancel the order and make purchases from the next higher tenderer or from the open market as the case may be. In that case the loss sustained by the institute shall be recovered from the defaulting supplier. The institute will be at liberty to recover the loss from the permanent earnest money/or any other pending claims of the supplier without prejudice to its general right to affect recovery from the supplier.

10. The prospective bidders can be those who are the manufacturers of the equipment. For items manufactured outside India, the manufacturer itself can be a bidder or its authorised Indian agent can bid on behalf of its Principal that is the manufacturer.

11. In the event, the country of origin of goods is India, only the manufacturers shall be considered eligible for bidding. Authorised agents of Indian manufacturers may be permitted to submit the bid, provided the concerned manufacturer states that as its policy, it does not bid itself in India and that there is no qualitative difference between manufacturer and its agent as bidder in respect of quality of supplies, cost, and responsibility of maintenance and servicing. The Indian manufacturer must describe the alternatives in clear terms, in the event the bidding agent ceases to continue as agent of the concerned manufacturer within the stipulated warrantee period.

12. If any Indian manufacturer requires importing an essential part from a foreign country, the said company may be given to enjoy the benefit of customs duty exemption with the aid of CDEC of MNIT, Jaipur provided the import of the concerned item is done on behalf of MNIT, Jaipur.

13. **THERE IS TWO BID SYSTEM:-**

(TECHNICAL AND FINANCIAL BID, both bids should be submitted in separate envelopes):

(A) Technical Bid:

a) Bidder must be a manufacturer/authorized distributor/ Dealers and they have to enclose a certificate of authorization of manufacturer in format at **Annexure – A (Authorization certificate in any other format will not be valid).**OEM itself or any one authorised dealer on behalf of OEM may participate in bid. OEM and its dealers both may not participate at the same time.

b) The manufacturers should supply documentary proof i.e. Registration with the Registrar of Industries, National Small Scale Industries Corporation or with penal of MNIT in case of

manufacturer. Offers other then the manufacturers should be supported with an authority letter from the manufacturers, authorizing them to quote rates standing guarantee for the satisfactory execution of supply orders failing which offers are liable to be ignored.

c) One declaration by the Manufacturer to the extent that in case of failure of its local agent /office to provide service support to the satisfaction of MNIT Jaipur, it shall make immediate arrangement for required service support.

d) **Bidder should enclose technical compliance from the Manufacturer. The specifications of items should be strictly as specified. Deviation, if any may please be mentioned separately. If there is no deviation than it should be mentioned as "No Deviation".**

e) The leaflets catalogue, related to quoted equipment/model etc. should be sent invariably, so that a proper evaluation of the equipment offered is possible.

f) Mention must be made of the pre-installation requirements for the equipment quoted viz. ambient temperature, humidity, weather specifications, power specifications, civil works etc. When items are provided full performance satisfaction should be demonstrated.

g) Bidder must enclose the acceptance of terms and conditions and must enclose the duly signed and stamped tender document.

h) All the Annexure enclosed should be duly filled up and signed.

i) Please attach proof/certificate of each condition required in the tender document.

j) The firm should provide approximate area required for the setting/installation of the machine / equipment.

k) Installation support and demonstration for utilizing the equipment is also needed

l) To mention, if any additional setup/infra is required before installation of equipment (esp. Foundation etc. For larger m/c)

m) Bidder shall enclose Earnest Money Deposit (EMD) and Tender Fee

(B) Financial Bid:

a) The rates to be quoted by the bidder should be clearly mentioned without any overwriting

b) If there is any cutting in the price box, issued be duly signed

c) The bidders should clearly mentioned their payment terms & conditions

d) The GST or any other taxes including Custom duty Etc. should be mentioned clearly

14. **Delivery Period:-**The ordered quantity of stores must be delivered within 12 to 14 weeks in the case of indigenous equipment and 14 to 16 weeks in the case of imported equipment after opening of L.C. / FDD and Wire Transfer. The extention of delivery period after placing the PO, if required, will be considered only on genuine reasons and proper justifications only.

15. **Installation**: - Successful BIDDER shall depute concerned specialist, for supervision of erection& commissioning of the machine to be carried out as and when necessary. The successful BIDDER shall make necessary arrangements during the entire warranty period at their own expenses for stay, transport and other expenses of their specialist during their stay in Jaipur;

16. **Warranty:** All the bidders are required to provide minimum **03 Year + 60 Days** warranty on the quoted equipment / instrument

17. **Performance Bank guarantee**

Successful Bidder has to Provide Performance security @ 10% of the equipment cost, valid for stipulated warranty period plus 60 days which should be in the form of Bank's Guarantee from a commercial bank in format at **Annexure – B**. Warranty will cover repair/replacement of all defective parts, if any, with the same or equivalent make for any part removed. Maintenance will be provided at site. The supplier will provide after sale service during the warranty period from nearest place to installation. The supplier will attend the complaint within 24 working hours and not beyond 5 working days.

18. **EARNEST MONEY**: A Demand Draft **(As per annexure –E)** from a Commercial bank only in the name of the Registrar, M.N.I.T. and payable at Jaipur may please be sent along with your tender as Earnest Monay **No tender shall be considered without earnest money / tender fee. Cheques are not accepted as earnest money amount.** No interest is payable by us on the amount of earnest money. **Kindly attach the RTGS details with cancelled cheque along with the Earnest Money.** The firms registered with NSIC/MSME are exempted for furnishing of EMD / Tender Fee. The Hard copy of NSIC/MSME registration certificate is to be enclosed in technical bid positively.

19. **Jurisdiction:**The Courts of Jaipur alone will have the jurisdiction to try any matter, dispute or difference between the parties arising out of this tender/contract. It is specifically agreed that no Court outside and other than Jaipur court shall have jurisdiction in the matter.

20. **Arbitration Clause: - In the eventuality of any dispute, the sole Arbitrator shall be MNIT, Jaipur and his decision shall be binding on all the parties.**

21. **Force Majeure** : Any failure of omission or commission to carry out the provision of this contract by the supplier shall not give rise to any claim by one party, one against the other, if such failure of omission or commission arises from an act of God; which shall include all acts of nature calamities such as fire, flood, earthquake, hurricane, or nay pestilence or from civil strikes, compliance with any statute and / or regulations of the Government, lockouts and strikes, riots, embargoes or from any political or other reason beyond the supplier's control including war (whether declared or not) civil war or stage of insurrection, provided that notice of the occurrence of any event by either party to the other shall be given within two weeks from the date of occurrence of such an event which could be attributed to Force Majeure conditions.

22. **Risk &Cost** : In the event of failure to carry out the contractual obligations, within the stipulated period or extended period and determination of the contract for any reason, violation of warranties etc. the MNIT Jaipur shall have the right to carry out the unfinished obligation at the exclusive - cost and risk of the bidder/firm, after due notice and the difference so accrued shall be recoverable from the bidder/firm.

23. The material found defective upon opening by the supplier representative in presence of Central stores personnel / indenter of MNIT Jaipur or not as per tendered specifications will have to be lifted back by the supplier at their own cost and risk. The material lying in MNIT Jaipur premises would be at supplier's risk and cost.

24. **Custom Duty :** The MNIT, Jaipur is a public funded research Institution registered with Department of Scientific & Industrial Research and concessional Custom Duty @5.15% is applicable for the goods purchased for research purpose vide Government of India Notification No.51/96-Customs dated 23.07.1996

25 **GST:**MNIT, Jaipur is a public funded research Institution registered with Department of Scientific & Industrial Research for concessional GST @5% applicable for the goods purchased for research purpose vide Ministry of Finance (Department of Revenue) Notification No.47/2017-Integrated Tax dated 14.11.2017 & Notification No.45/2017-Central Tax dated 14.11.2017.

26. **Bid Validity:** 90 days (Minimum)

27. **Opening of Bids:** The Bids shall be opened by authorised officials of the institute as per schedule given in Date Sheet.In case, the day of bid opening is declared a holiday by the government, the Bids will be opened on the next working day at the same time. No separate intimation shall be sent to the bidders in this regard.Only opening of bids and accepting the bid will not mean that the firm is technically or financially qualified.

28. **Institute right to vary Quantities at Time of Award or later** : Institute reserves the right at the time of awarding the contract to increase or decrease the quantity of goods and services originally mentioned in our NIT without any change in unit price or other terms and conditions.

29. While submitting the tender, the **GST Registration No**., **PAN No.&E-mail Address** is to be mentioned by the bidder positively. Failing this, there bid will be treated as non responsive.

30. **After Sales Service Certificate :**After sales service certificate is to be furnished by successful bidder in the prescribed form as **annexure –C**

31. Specification Enclosed as annexure - D

Deputy Registrar
(Store & Purchase)

Annexure - A

MANUFACTURERS' AUTHORIZATION FORM

[The Bidder shall require the Manufacturer to fill in this Form in accordance with the instructions indicated. This letter of authorization should be on the letterhead of the Manufacturer and should be signed by a person with the proper authority to sign documents that are binding on the Manufacturer.]

Date : [insert date (as day, month and year) of Bid Submission]

Tender No. :[insert number from Invitation For Bids]

To : [insert complete name and address of Purchaser]

WHEREAS

We [insert complete name of Manufacturer],who are official manufacturers of [insert type of goods manufactured], having factories at [insert full address of Manufacturer's factories], do hereby authorize [insert complete name of Bidder]to submit a bid the purpose of which is to provide the following Goods, manufactured by us [insert name and or brief description of the Goods],and to subsequently negotiate and sign the Contract.

We hereby extend our full guarantee and warranty in accordance with Clause 2.20 of the General Conditions of Contract, with respect to the Goods offered by the above firm.

Signed: [insert signature(s) of authorized representative(s) of the Manufacturer]

Name: [insert complete name(s) of authorized representative(s) of the Manufacturer]

Title: [insert title]

Duly authorized to sign this Authorization on behalf of: [insert complete name of Bidder]

Dated on _____ day of _____, _____ [insert date of signing]

*(Not required in case the bidder itself is the manufacturer)

Annexure - B

PERFORMANCE BANK GUARANTEE

(To be executed on Stamp Paper of Rs. 100/- or such higher value as per the Stamp Act of the State in which the Guarantee is issued. Stamp Paper should be in the name of the Bank Issuing the Guarantee.)

BANK GUARANTEE NO. :
DATED :

Dear Sirs,

1. THIS DEED OF GUARANTEE made on this ..... day of.....…….. between**MALAVIYA NATIONAL INSTITUTE OF TECHNOLOGY, JAIPUR** (hereinafter called the "**MNIT"** which expression shall unless excluded by or repugnant to the context includes its successors and assignees) of the one part and the ..... (hereinafter called the **"Bank"** which expression shall unless excluded by or repugnant to the context include its successors and assignees) of the other part.

2. AND WHEREAS as per clause _____ of the purchase order in question the supplier shall furnish a Performance Bank Guarantee of 10% of P.O. Value i.e. Rs. …….. (Rs..... ..... only) valid for the period of two months beyond warranty period as and by way of security for satisfactory working of the ……..... .... AND WHEREAS at the request of the supplier, the Bank executes these presents.

3.0 THIS DEED WITHNESSETH AND IT IS HEREBY AGREED AND DECLARED BY AND BETWEEN PARTIES HERETO AS FOLLOWS:

3.1 The Bank hereby guarantees to the MNIT, Jaipur that the equipment / service contracted are capable of performing the work as demanded by the MNIT, Jaipur. In the event of equipment / service failing to perform to the satisfaction of the MNIT, Jaipur, which shall be final and conclusive of the factum of non-performance, the Bank shall indemnify and keep the indemnified to the extent of ..... of P.O. Value i.e. Rs. ..... (Rupees ....) valid for the period of two months beyond the warranty period against any loss or damage that may be caused to or suffered by the MNIT, Jaipur consequent to non-performance of the contracted equipment / services to be supplied by the supplier.

3.2 In consideration of the aforesaid premise and at the request of the supplier, we the Bank hereby irrevocably and unconditionally guarantee that the supplier shall perform in an orderly manner their contractual obligations in accordance with the terms and conditions set forth in the Purchase order dated ..... and in the event of the supplier's failure to do so, the Bank unconditionally pay to the MNIT, Jaipur on demand, any amount up to the value mentioned in Clause 3.1 above without any reference to the supplier and without questioning the claim.

3.3 The guarantee herein shall remain in full force for a period of two months beyond the warranty period from the date of certification by the MNIT, Jaipur of successful installation and commissioning of the equipment/ service contracted. Date of start of warranty period will be notified by MNIT, Jaipur to the Bank.

3.4 The decision of the MNIT, Jaipur regarding the liability of the Bank under the guarantee and the amount payable there under shall be final and conclusive and binding on us without

question. The Bank shall pay forthwith the amount demanded by the MNIT, Jaipur not withstanding any dispute, if any, between the MNIT, Jaipur and the supplier.

3.5 The Bank further agrees that the guarantee herein shall remain in full force during the pendency of aforesaid period mentioned in Clause 3.3 above and also any extension of the guarantee which has been provided by the Bank for this purpose beyond the aforesaid period provided, further, that if any claim accrues or against the Bank by virtue of this guarantee, should be lodged with us within a period of 60 days from the date of expiry of the guarantee period.

3.6 This Guarantee shall not be affected by any change in constitution of the supplier, MNIT, Jaipur or us not shall it be affected by any change in constitution or by any amalgamation orabsorption or reconstruction thereof otherwise, but will ensure for and be available to and endorsable by the absorbing amalgamated company or concern.

3.7 The MNIT, Jaipur has the fullest liberty without affecting the guarantee to postpone at any time or from time any of the powers exercisable by it against the supplier, either to enforce or forbear the clause governing guarantee in the terms and conditions of the said contract and Bank shall not be released from its liabilities under the guarantee by any matter referred to or by reason of time being given to the supplier or any other forbearance, act or omission on the part of the MNIT, Jaipur or any material or things whatsoever which under the law relating to sureties shall but for the provisions hereof have the effect of so releasing the Bank from its liabilities.

3.8 We further agree that the MNIT, Jaipur shall have the fullest liberty without affecting in any way our obligations hereunder with or without our consent or knowledge to vary any of the terms and conditions of the said contract or to extend the time of delivery from time to time.

3.9 The Bank undertakes not to revoke this guarantee during its currency except with the previous consent in writing of the MNIT, Jaipur.

3.10 We further agree that in order to give full effect to the guarantee herein contained MNIT, Jaipur shall be entitled to act as if we were its principal debtors in respect of its claim against the Supplier hereby guaranteed by us as aforesaid and we hereby expressly waive all our rights of suretyship and other rights if any which are in any way inconsistent with the above provision of this Guarantee.

Notwithstanding anything herein before, liability of the Bank under this guarantee is restricted to Rs. ..... (Rupees ..... only) and it will remain in force up to the period specified in Clause 3.3 unless a suit to enforce any claim under the Guarantee is filed against the Bank before the period specified in Clause 3.4. All your rights under this Guarantee shall be forfeited and we shall be relieved and discharged from all liabilities thereunder.

COUNTERSIGNED

Signature	:	Signature	:
Name	:	Name	:
Designation	:	Designation	:
Organization	:	Organization	:

Annexure – C

AFTERSALE SERVICE CERTIFICATE

From:

To

The Registrar,
Malaviya National Institute of Technology (MNIT),
Jaipur

Whereas, we M/s (Bidder Name) are established & reputable manufacturers (Make of items) of [items name] having service offices at Delhi, Jaipur and in the state of Rajasthan. Details are as under:

Sr.No.	Address of Service Centre	Phone No.	Number of Engineers
1.			
2.			
3.			

We do hereby confirm that:

Services including repair/replacement of defective parts will be done by us. Replacement of defective Systems/parts will be done by equivalent or better systems/parts of the same make. We will attend all the complaints/service calls within 24 working hours and not beyond 5 working days. Down time will not exceed beyond 5 working days. In case, down time exceed 5 working days then we will extend the warranty period of that item(s) double of the down time.

(Signature)

Name :

Designation :

(Head or Senior Executive of Firm)

Address :

Phone No :

Fax No:

Mobile No :

S.No	Name of The Equipments	Detailed Specifications	Qty
		Mass Transfer Lab	
1	**Crystalliser**	• Crystallisation vessel with jacket for heating and cooling , vessel filling and drain arrangement • Solution concentration measurement by conductivity meter • Vacuum filtration assembly • Hot air oven for crystal drying o Temp: up to 150^{o}C o Size: 18" x 18" x 18" o SS partition: 2 • Sieve shaker with complete set of sieves (8", sieve size) , Mesh size: 60, 85, 100, 150, 200, 300, 400, 500 • Sieves MOC: Brass Weighing balance with 2 digit accuracy (max capacity 250 gms)	**01**
2	**Mass transfer with Reaction set up**	• Glass reactors (qty: 4) with dean and stark & condenser. Volume: 500 ml (each) • Heating mantle (qty:4) to hold the glass reactor. Capacity: 1 kw each. • Temperature sensor and indicator (4 sets): 0-100^{o}C. • Set of glassware i.e. beakers, measuring cylinders, conical flask etc • Titration set up for analysis. • Amberlyst-15 (dry): 1kg Oil bath: Capacity 7 liters, Temp(-10 to 150^{o}C)	**01**
3	**Vapour Liquid Equilibrium set up with standalone frame**	• Ebulliometer with condenser and heating arrangement (Qty:2) • Rheostat for heating control (Qty:2) • Temperature sensor and indicator (2 sets): 0-100 DegC. • Set of glassware i.e. beakers, measuring cylinders, conical flask etc • Refractive index meter (01) Oil bath with circulation: Capacity 7 liters, Temp range: -10 to 200^{o}C	**01**
4	**Gas diffusion set up with digital microscope (software operated)**	• Capillary (dia: 2mm)Tee piece • Air source (Cylinder or compressed air) • Syringe for capillary filling • PID controller with heater (max temp 60^{o}C) • Microscope and scale to measure the level in the capillary. Suitable software to record the data	**01**
5	**Liquid diffusion set up**	• Acrylic diffusion vessel (volume: 1 liter) • Glass diffusion cell • Conductivity meter with electrode with automatic temperature compensation (Range: 200 – 2000 microsimens) • Magnetic stirrer	**01**

Petroleum Lab.			
1.	**Petroleum product distillation apparatus ASTM D-86**	1. Power supply: AC(220±10%)V, 50Hz 2. Heating power: 1000W,continuous adjustment 3. Receiving cylinder: 100ml,scale division 1ml 4. Distillation flask: 125mL.It can meet requirements GB/T 6536 and ASTM D86 5. Thermometer: (-2 to 300)℃ and (-2 to 400)℃. Division value 1℃ 6. Flask support board: Sic, diameter for each hole is φ32mm,φ38mm and φ50mm 7. Ambient temperature: Room temp.~+35℃	**01**
2.	**Ash Content determination Apparatus**	Standard: ASTM D2584, ASTM D5630, Internal Chamber Size: Width 10cm x Height 10cm x Depth 22.5cm System Status-Digital Temperature Controller Micro- processor based double display digital PID controller Heating - High grade nichrome wire Heater Temperature Range :Ambient to 950°C Temperature Accuracy :±1°C or better optional Safety MCB / Fuse : Fuse should available on electric panel Insulation :100mm double wall thick ceramic-wool insulation Material Of Construction- Inner chamber: Tough treated ceramic Outer chamber: Heavy CRC dual side powder coated Power Supply :230V AC, Single phase, 50Hz Supply with necessary accessories.	**01**
IPA lab.			
1.	**LABOROTARY OVEN**	Type of Product: Dry Hot Air Oven Temperature Range : RT+10Â°~300Â°C Capacity: 80 Ltr Voltage: 220V, 50Hz, Single phase No. of Shelves: 2 Power Supply: 1550 W Dimensions: 450x 400x450 mm, Display Resolution: Â±1Â°C	**1**
2.	**MUFFLE FURNACE**	Inside Chamber Size 6" x 6" x 6”, 3.6L approx with swing aside door at the front Furnace construction: (i) Double shell steel case with cooling fan to keep outside case cool (ii) High purity alumina fiber insulation for max. energy saving Heating element: The chamber section should be heated by six to eight Super Kanthal Molybdenum disilicide heating elements (Super 1800 grade MoSi2) suspended in a chamber made of high temperature refractory fiber lined with a combination of ceramic fibre blankets.	**1**

		Standard Working : Temperature :1600° C (continuous) Maximum Working Temperature :1700° C (< 3 hours) Temperature Control : The temperature controller should be a PID automatic control power control and programmable with necessary safety features.Heating Rate : The furnace should be of fast heating type with the maximum attainable temperature should reach as a ramp function in less than one hour. Temperature Accuracy : +/- 1.0 ºC Thermocouple Pt. Pt. Rh. Thyristor controller will be provided along with the furnace to measure the temperature with Recrystalized alumina sheath & connecting holder complete set. Cooling Fan/ Air Circulation : Attached with Furnace, Provided inside the control unit to protect Costly component Max. Power Upto 8 KW Certificate CE certified	
3.	**RESPIRABLE DUST SAMPLER**	Flow Rate: 0.8 to 1.5 m^3/min Particle Size: Up to 10 micron collected on filter and SPM bigger than 10 micron collected in a separate collector cup Blower:Continuous duty blower with Brushless blower Recommended Filter:GF/A(8" x 10") for common use, EPM 2000 for special Research or Equivalent Time Record:0 to 9999.99 hrs. Time Totalizer records the running time in hours Timer:24 hr Programmable timer Power Requirement: 220 Volts, Single Phase AC Accuracy: +2% of FSD	**1**
4.	**BOD INCUBATOR CUM ORBITAL SHAKER**	Capacity : 8 cu. Ft Approx Volume : 230 (Ltr) No. of Shelves : 2 Temperature Range : 5°C above ambient to 60°C (Resolution 0.1°C) Temp. Controller : By Microprocessor Based PID Digital Temperature Indicator cum Controller Shaking amplitude : 25mm RPM Display Digital Shaking Speed : Variable speed from 20 RPM to 250 RPM Temp. Accuracy : +1°C Temp. Display : LED Display for Set Value(SV) and Process Value (PV) Relay : Solid state electronic relay with protective heat sink Air Circulation: By forced convection system Insulation : By High density PUF /Glass Wool Operations : Nearly silent operation with ultra-low vibration Electric Supply : 220/230V AC, 50/60Hz LCD Controller with Data Logger : (16 x 2) with optional RS-485 communication ports, cables window based software with inbuilt data recording. Communication Port : Communication Port with	**1**

		interface and data cable to download data to your PC. Timer : With reverse 0 - 24 hours for regulating hours of light and darkness including. fitting at the top of incubator Shaking Frequency : Range 50 to 300rpm Shaking Motion : By Permanent Magnet DC Drive for continuous operations . Lotus Clamp Holders : Made of Stainless Steel (SS-304) (One set supplied as per user configuration) Flask Configurations : Available 36 Erlynmeyer Flasks of 100ml capacity each. (any one set supplied with the unit) 24 Erlynmeyer Flasks of 250ml capacity each. 16 Erlynmeyer Flasks of 500ml capacity each. 9 Erlynmeyer Flasks of 1000ml capacity each. Chamber sterilization : By U.V. germicidal tube. Interior Illumination : By fluorescent tubes for photosynthetic applications	
5.	**NEPHELOMETER/TURBIDITY METER**	Turbidity Range (NTU) : 0 to 1000 NTU (Nephelometric Turbidity Unit) Range selection : Automatic Resolution 0.001 NTU Accuracy : ± 2% of reading plus 0.02 NTU Repeatability : ±1% of reading or 0.02 NTU whichever is greater Light source : Tungsten filament lamp Lamp Life : greater than 100,000 readings Light Detector : silicon photocell Stray Light : < .002 NTU Method : ratio nephelometric method, ratio of scattered and transmitted light ;adaptation of USEPA method 150.1 and standard method 2130 B Measuring mode : normal, average, continuous Turbidity Standards : < 0.1,15,100 and 750 NTU LOG memory : 200 records Serial interface : USB or RS232 Power Supply : 1.5V AA alkaline batteries (4) or AC adapter; auto off after 15 minutes of non –use Designed should meet EPA 180.1	**1**
6.	**Bench top DO and BOD meter**	The HI5421 is supplied with the HI76483 Clark-Type Polarographic probe that measures a wide range of dissolved oxygen from 0.0 to 600% saturation and 0.00 to 90.00 mg/L (ppm). The HI76483 is only 12 mm in diameter and has a built-in thermistor temperature sensor that compensates for temperature variations from 0 to 50 ^{o}C. It offers three additional measurement modes: Biological Oxygen Demand (BOD), Oxygen Uptake Rate (OUR) and Specific Oxygen Uptake Rate (SOUR).	**1**

CRE Lab.			
1	**BATCH REACTOR**	Reactor : Material Stainless Steel, Volume 2 Ltrs. (Approx.) Water Bath : Material Stainless Steel, Double wall, insulated with Ceramic wool. Heater : Nichrome wire Heater Stirrer (2Nos.) : Stainless Steel Impeller and shaft coupled with FHP motor. Temp. Sensor (2 Nos) : RTD PT-100 type Control panel comprises of : Digital Temp. Controller (2 Nos.) : PID Controller, 0-199.9°C (For Water Bath and reactor both) With Standard make on/off switch, Mains Indicator etc. Operating manual. An ENGLISH instruction manual consisting of experimental procedures, block diagram etc. will be provided along with the Apparatus. The whole set-up is well designed and arranged on a rigid structure painted with industrial PU Paint. Two and half feet height SS stand for the equipment	1
2	**PLUG FLOW REEACTOR** (Coiled tube, 1 No.)	Reactor : Material Stainless Steel, Volume (0.6-0.7) Ltrs (approx.) Feed Tank : Material Stainless Steel (2Nos.), Capacity-20 Ltrs. (approx.) Flow Measurement :Rotameter 2Nos.(One each for Reactants). Piping : Stainless Steel andPU pipe . Pressure Regulator : 0-2 Kg/cm^2 Pressure Gauge : Bourdon type 0-2 Kg/cm^2 Operating manual An ENGLISH instruction manual consisting of experimental procedures, block diagram etc. will be provided along with the Apparatus The whole set-up is well designed and arranged on a rigid structure painted with industrial PU Paint. Two and half feet height SS stand for the equipment	1
3	**CSTR IN SERIES** (stand alone, 1 No.)	Reactor (3Nos.) : Material Stainless Steel, Capacity 1 Ltr.(Approx.) Agitator : Material Stainless Steel Impeller and shaft coupled with FHP motor Feed Tank (2Nos.) : Material Stainless Steel, Capacity - 20 Ltrs. (Approx.) Feed Circulation : By Peristaltic Pump (2Nos.) Piping : Stainless Steel and Silicon pipe Control Panel comprising of: Standard make on/off switch, Mains Indicator etc. Operating manualAn ENGLISH instruction manual consisting of experimental procedures, block diagram etc. will be provided along with the Apparatus The whole set-	1

		up is well designed and arranged on a rigid structure painted with industrial PU Paint. Two and half feet height SS stand for the equipment	
4	**R.T.D. Studies in Plug Flow Tubular Reactor Setup (1 No.)**	Reactor : Material Stainless Steel, Capacity (0.6-0.7) Ltrs. (Approx.) (Helical Coiled Tube Type) Feed Tank : Material Stainless Steel, Capacity 20Ltrs. (Approx.) Feed Circulation : By compressed air. Flow Measurement : By Rotameter. Piping : Material Stainless Steel and PU pipe. Pressure Regulator : 0-2 Kg/cm^2 Pressure Gauge : Bourdon type 0-2 Kg/cm^2 Stop Watch : Electronic Operating manual Two and half feet height SS stand for the equipment	
5	**Recycle Packed Bed Reactor Setup (1 No.)**	Reactor Column : Material Stainless Steel Diameter 25mm (approx.), Length: 500mm (approx.). Packing : Catalyst Feed Tank (1Nos.) : Material Stainless Steel, Capacity 20 Ltrs. Flow Measurement : By Peristaltic Pump (2Nos.) Piping : Stainless Steel and PVC. Hot water tank : Made of Stainless steel, Double wall, insulated with Ceramic Wool. Capacity: (10-15) ltrs. Hot water Circulation : Magnetic Pump of Poly propylene to (in outer Jacket) circulate Hot Water, maximum working temp. 85°C Heater : Nichrome wire Control panel comprising of : Digital Temp. Controller : PID Controller, 0-199.9°C (For Hot Water Tank) Operating manual Two and half feet height SS stand for the equipment	1
6	**ANNULAR UV-PHOTO REACTOR** (1 No.) **PERISTALTIC PUMP FEED SYSTEM**	• UV Source 30 W / 16 W. • Reactor of Effective volume of reactor (1-1.5 Ltrs) should be provided with inside reflective surface. • Feed Tank of Capacity 5 Ltrs should be made of Stainless Steel 304 Grade minimum thickness of the sheet is 2mm. • Flow Circulation should be done by Peristaltic Pump(Reputed make). • For refrence Calibration certificiate of the perstalic pump should be attched with tender documents. • Sampling points are provided at inlet & outlet of reactant line. • Operating/instruction manual and sample calculations with Photographs, line diagram, design and drawing of the impeller must be provided along with tender documents.	1

		• Equipments has to be demonstrated at college site, results should be repeatable within ±5% of the sample calculations provided.The whole set-up should be well designed and arranged on a rigid structure painted with industrial PU Paint	
7	**PH CONDUCTIVITY METER**	pH :- Range : -2.00 to 20.00 pH Resolution : 0.1 pH; 0.01 pH; 0.001 pH Accuracy : -0.1 to +.0.1 pH; -.002 to +.002 pH -1 to +1 LSD Calibration : automatic, upto five –point calibration,eight standard buffers available and five custom buffers mV:- Range : -2000 to +2000 mV Resolution : 0.1 mV Accuracy -0.2 to +0.2 mV -1 to +1 LSD EC (electrical conductivity) :- Range : .000 to 9.999 uS/cm; 10 to 99.99 uS/cm;100.00 to 999.9 uS/cm; 1.000 to 9.999 mS/cm;10.00 to 99.99 mS/cm; 100.0 to 1000.0 mS/cm absolute EC Accuracy : -1 % o +1% of reading Cll constant : 0.0500 to 200.00/cm Cell type : 4 – pole cell Calibration : automatic standard recognition, user standard single point/ multi –point Temperature coefficient : 0.00 to 10.00 %/deg. C Reference temperature : 5.0 to 30.0 deg. C Profiles : up to 10, 5 each channel TDS :- Range : 0.000 to 9.999 ppm;10.00 to 99.99 ppm; 100.0 to 999.9 ppm; 1.000 to 9.999 ppt; 10.00 to 99.99 ppt; 100.0 to 400.0 ppt actual TDS (with 1.00 factor) Resolution : 0.001 ppm; 0.01 ppm; 0.1 ppm; .001 ppt;0.01 ppt; 0.1 ppt Accuracy : -1 % to +1 % of reading	1
Heat Transfer Lab.			
1	**Thermal Conductivity Of Metal Bar Apparatus**	**Metal Bar** Material-copper,Length- 450 mm, Diameter-25 mm. **Insulating shell** Length- 250 mm ,Dia-200 mm **Cooling water jacket** Length- 75 mm ,Diameter- 50 mm **Heater-** of adequate capacity , Nichrome wire, **Temperature sensor**- RTDPT:100 type (minimum 10 nos) Control panel comprising of Digital voltmeter:0-300 Volts	1

		Digital Ammeter: 0-2 Amp Digital Temperature Indicator 0-200^{o}C with multichannel switch, Temperature sensors: RTD PT-100 type- minimum 8 no with standard make on/off switch, mains indicator etc. The Set-up should well designed and arranged on a rigid structure painted with Industrial PU paint. Equipment should provide with painted SS table for setup support.	
2	**Experimental Set-Up For Thermal Conductivity Of Insulating Powder Material**	**Inner Sphere**:Dia-100 mm **Outer Sphere**:Dia-200 mm Heater:of adequate capacity ,Nichrome wire , Control panel comprising of: PID Controller: 0-200^{o}C **Energy meter**: Digital type for power measurement Digital Temperature Indicator 0-200^{o}C with multichannel switch, Temperature sensor- RTDPT-100 type (minimum 10 no), with standard make on/off switch, mains indicator etc. The whole Set-up should well designed and arranged on a rigid structure painted with Industrial PU paint. Equipment should provide with painted SS table for setup support	1
3	**Critical Heat Flux In Saturated Pool Boiling Apparatus**	**Boiling Chamber**-Rectangular chamber of Material-SS with Transparent window for observation of test heater. **Water bath**- 10 lit. capacity made with SS Test heater- with holding arrangement for quick change of wire. **Heater capacity**-2 KW Control Panel comprises of Digital Temp. Controller- 0-200^{o}C, 0-230V,0-2A for water bath , Dimmer stat- 0-4 A, 230V.On off switch, mains indicator etc. The whole Set-up should well designed and arranged on a rigid structure painted with Industrial PU paint. Equipment should provide with painted SS table for setup support.	01
4	**Thermal Conductivity Of Liquid**	**Liquid chamber**-Dia-165 mm SS-304 **Cooling chamber for water circulation**: SS-304 make Heater: Diameter 150 mm sandwiched between copper plates Testing material – Capillary: 10 MM Diameter and 150 mm long Thermal conductivity range -0.05-0.75 w/m.^{0}K **Heater capacity-1 KW** Insulation- Ceramic wool	01

		Control panel comprising of: PID Controller: 0-200^{o}C **Energy meter:** Digital type for power measurement Digital Temperature Indicator 0-200^{o}C with multichannel switch, **Temperature sensor**- RTD PT-100 type (minimum 6 no) Should Provide MS Cabinet to accommodate slab assembly. The whole Set-up should well designed and arranged on a rigid structure painted with Industrial PU paint. Equipment should provide with painted SS table for setup support.	
5.	**Apparatus For Heat Transfer Through Agitated Vessel**	**Steam Generator-** Capacity of 25 liter made with SS material outlet stream of steam should insulated with Glass wool & aluminum shell, with pressure regulator, Digital pressure indicator, Drain valve, Safety valve, water inlet valve made of Brass material. **Heater Capacity**-6KW **Jacketed Vessel**: ID-500 mm, Height-400 mm Material-SS, Capacity-40 liter. **Impeller** - 4 blade paddle type impeller of diameter 200 mm water stirrer capacities 0- 500 rpm. **Water Rota meter**-Eureka make 0-10 lpm with uniform Division scale of 0.1 lpm. Control Panel comprises of Digital Temp. Controller- 0-200^{o}C, 0-230V, 0-200^{o}C with multichannel On off switch, mains indicator etc. The whole Set-up should well designed and arranged on a rigid structure painted with Industrial PU paint. Equipment should provide with painted SS table for setup support.	01
		PDC lab	
1.	**Flow Control Trainer**	**Type of control:** SCADA **Control unit**: Digital indicating controller with Ethernet communication **Diff. pressure transmitter:** Type Capacitance, two wire, Range 0–200 mm, Output 4–20 mA sq.root, **I/P converter:** Input 4-20mA, Output 3-15 psig, **Control valve:** Type Pneumatic, Size 1/4", Input 3–15 psig, Air to close, Characteristic Linear, **Rotameter:** 10-100 LPH, **Pump:** Fractional horse power, type submersible **Supply tank**: SS304 **Flow measurement:** Orifice meter **Air filter regulator**: Range 0-2.5 kg/cm^2, **Pressure gauge:** Range 0-2.5 kg/cm^2(1No), Range 0-7 kg/cm2(1No),	**1**

2.	**Level Control Trainer**	**Type of control**: SCADA **Control unit:** Digital indicating controller with Ethernet communication **Level transmitter**: Type Electronic, two wire, Range 0–250 mm, Output 4–20mA, **I/P converter Input:** 4-20mA, Output 3-15 psig, **Control valve Type**: Pneumatic, Size 1/4", Input 3–15 psig, Air to close, Char. Linear, **Rotameter**: 10-100 LPH, **Pump**: Fractional horse power, type submersible **Process tank**: Transparent, Acrylic, with 0-100% graduated scale **Supply tank:** SS304 **Air filter regulator**: Range 0-2.5 kg/cm2, **Pressure gauge**: Range 0-2.5 kg/cm2(1No), Range 0-7 kg/cm2(1No),	**1**
3.	**Pressure Control Trainer**	**Type of control**: SCADA **Control unit:** Digital indicating controller with Ethernet communication **Pressure transmitter**: Type Two wire, Range 0–5 bar, Output 4–20 mA, **I/P converter:** Input 4-20mA, Output 3-15 psig, **Control valve:** Type Pneumatic, Size 1/4", Input 3–15 psig, Air to close, Char. Linear, **Process tank**: Pressure vessel, MS **Air filter regulator**: Range 0-2.5 kg/cm2, **Pressure gauge**: Range 0-2.5 kg/cm2(1No), Range 0-7 kg/cm2(1No),	**1**
4.	**Non Linear Level Control**	Product Non linear level control Computer interface NI USB-6001, 14 bit, 20KS/S 1Multifunction I/O and NI-DAQMX. Analog input4, Analog output 2 Communication USB port Level transmitter Type Capacitance, two wire, Range 0–250 mm, Output 4–20 mA , Make Yokogawa I/P converter Input 4-20 mA, Output 3-15 psig, Make Control air Control valve Type Pneumatic, Size 1/4", Input 3–15 psig, Air to close, Char. Linear, Make Pneucon Rotameter 16-160 LPH and 40-400 LPH Make eureka Pump Fractional horse power, Type submersible Process tank SS Spherical, Transparent acrylic cylindrical with cylindrical to conical conversion kit. Supply tank SS304 Air filter regulator Range 0-2.5 kg/cm2, Make Airmatic Pressure gauge Range 0-2.5 kg/cm2 (1No), Range 0-7 kg/cm2 (1No),	**1**
5.	**Temperature Control Trainer**	**Type of control:** SCADA **Control unit:** Digital indicating controller with Ethernet communication, Temperature sensor: Type RTD, PT100	**1**

		Heating control: Proportional power controller (SSR), Input 4-20 mA, Capacity 20 A. **Heater:** Type Electrical 2 coil, Capacity 3 KW **Rotameter:** 6-60 LPH, **Process tank**: SS304, Capacity 0.5 lit, insulated	
6.	**Cascade Control Trainer**	Product Cascade control trainer DAQ device NI USB-6001, 14 bit, 20KS/S Multifunction I/O and NI-DAQMX, Analog input 4, Analog output 2 Communication USB port DP transmitter Type Capacitance, Two wire, Range 0–200 mm, Output 4–20mA sq.root Level transmitter Type Electronic, Two wire, Range 0–250 mm, Output 4–20mA I/P converter Input 4-20mA, Output 3-15 psig Power supply Model S-15-24, Output 24 VDC, 0.7 A Control valve Type Pneumatic, Size 1/4", Input 3–15 psig, Air to close, Char. Linear Rotameter 10-100 LPH Pump Fractional horse power, type submersible Process tank Transparent, Acrylic, with 0-100% graduated scale Flow measurement Orifice meter Air filter regulator Range 0-2.5 kg/cm2 Pressure gauge Range 0-2.5 kg/cm2 (1No), Range 0-7 kg/cm2 (1No)	**1**
7.	**Computer**	INTEL CORE i7 8TH GENERATION, 16 GB DDR 4 RAM, I TB SATA HDD, 240GB SSD Drive LED MONITOR (24 inch), Resolution: 1920 x 1080 @ 60 Hz (Full HD), KEYBOARD MOUSE WIRELASS WIN 10 PROFESSIONAL, 3 YEAR WARRENTY ON SITE	**2**
		MTO LABORATORY	
1.	**Centrifugal pump test rig(variable speed with DC motor & drive, All tanks with SS 304)**	Pump: capacity 1 HP Speed: 2800 RPM (max) Head: 12 m (max, Make: Kirloskar Drive: Variable speeddrive Supply tank: Capacity 50 Ltrs Measuring Tank: Capacity 30 Ltrs fitted with Piezometer Tube & Scale Piping: GI/PVC Stop Watch: Electronic Pressure Measuring Instruments:- Pressure Gauge: Bourdon type, Range: 0-4 Kg/cm^2 Vacuum Gauge: Bourdon type, Range: 0-760 mm of Hg Compound Gauge: Bourdon type, Range:760 mm Hg to 2 Kg/cm^2 Control panel: With required electrical instrumentation, RPM indicator with proximity sensor, electronic energy meter, On/Off Switch main indicator etc.	
2.	**Reciprocating pump test**	Pump: Double acting, single cylinder, capacity 1 HP Speed: 250 RPM (max)	

	rig(variable speed with DC motor & drive, All tanks with SS 304)	Head: 5 m (max) Drive: Variable speed drive Supply tank: Capacity 50 Ltrs Measuring Tank: Capacity 30 Ltrs fitted with Piezometer Tube & Scale Piping: GI/PVC Stop Watch: Electronic Pressure Measuring Instruments:- Pressure Gauge: Bourdon type Control panel: With required electrical instrumentation, RPM indicator with proximity sensor, electronic energy meter, On/Off Switch main indicator etc.	
Equipment Common to all Labs			
1	**WEIGHING BALANCE**	Capacity: 220 g; least count: 0.1mg, Readability: 0.1/0.01 mg, Repeatability ≤ 0.1 mg; linearity ± 0.2 mg; temperature coefficient of sensitivity: ± 2 ppm/°C, Response time: ≤3 sec. Needs to be ISO CE certified.	**4 Nos.**
2	**MUFFEL FURANCE**	Outside body made up of heavy gauge M.S /G.I duly powder coated Inner muffle with high temp. Insulating Maximum Temperatures 1000 C/1200 C & working temperature 930 C/1130 C. Temp. Controlled by Digital Temperature Controller cum Indicator. Heating elements made of kenthal wire would extremely on the muffle. Control panel fitted on top of the units with indicating Lamps & Switches. A Uniform heat distribution through all 4 sides with kental wire. A special solid state silver fuse for protection to elements in case of overheating. Operates on 230 Volts A.C.	**2 Nos.**
3	**UNIVERSAL OVEN**	Outer & Inner chamber is made of STAINLESS STEEL. **Capacity**: 250 L **Heating Load:** 2.50 KW **Temp. Controller:** By Microprocessor Based PID Digital Temperature Indicator cum Controller **Temperature Range:** 50°C to 250°C **Temp. Sensitivity:** ± 1°C. **Air Circulation** By forced convection system **Display:** Digital LED with Set Value and Process Value **Operating Voltage:** 220 Volts AC (50 Hz). **Warranty (On-Site):** 3 Year Suitable insulation should be provided between outer body & Inner chamber to minimize thermal loss, Proper sealing of the double walled door with gasket. Ventilation slides to control inner air / vapor circulation. Inner chamber should be provided with ribs for placing the shelves at convenient levels.	**2 Nos.**
4	**DOUBLE DISTILLATION UNIT**	Output capacity: 5-6 ltr/hr Heating element: 9 KW or more Heating Element should be enclosed in Quartz material The apparatus should consist of a boiler made from high purity quartz with built in heater and bottom discharge	**3 Nos.**

		joint for easy cleaning of deposits. A spiral condenser made of quartz should be fitted on the boiler with receiving adapter. Provision for Safety Control Unit to protect the Glass parts in case of water failure or overheating.	
5	**ORBITAL SHAKER INCUBATOR WITH TEMP. CONTROLLER**	Outer body and inner chamber MOC: Stainless Steel - Grade 316 with mat finish Shaking range: 50 - 300 RPM Temperature Controller: Digital Controller with Alarm withgraphic LED, Timer 0-9999 min, RS-232 Port, Password Protection Temperature range: +5 to +75 °C with an accuracy of ±0.5°C or better RPM Indicator: Digital RPM Indicator Cooling: CFC Free System Heating : By Low Wattage Stainless Steel Heater Air Circulation: 2 Nos. FHP Blower Door: Double Door, Inner Door of Glass Illumination: 3 Nos. Fluorescent Tubes to be provided inside the chamber Shaker Platform (MOC : Stainless Steel - Grade 316): To hold 16Flasks of 500 mL capacity Drive: DC Drive with Speed regulator Size: 625(W) x 550(D) x 550 (H) mm Capacity: 190 L Stainless steel perforated tray for the use of upper portion of the incubation chamber. Spare supply: One spare platform (MOC: Stainless Steel - Grade 316) to accommodate other capacity of flasks. CE Marking that the product meets the EC directives for health, safety and environmental protection standards. Power Supply Voltage: Compatible to 220-240 Volts AC 50Hz. Voltage stabilizer: Adequate capacity preferably with input and output voltage display.	**2Nos.**
6	**pH-EC-TDS-ISE meter with electrodes for pH and EC-TDS**	Compatible with220/230 V Power supply, 5-point calibration for pH & ISE, Accuracy: 0.01 pH and 0.01 µS/cm, with Electrode Holder, ATC for pH, Calibration solution to be provided for pH: 4, 7 and10.	**3 Nos.**
7	**UV-Vis SPECTROPHOTOMETER**	**Microprocessor based UV-Vis Spectrophotometer from established and reputed global manufacturer with following specifications:** ▪ Stand-alone operation with Touch panel & complete control through PC with a dedicated Software capable of multicomponent analysis. ▪ High visibility color touch panel: 24-bit color touch screen with stylus pen. ▪ Scan speed of up to 29,000 nm/min for high speed Kinetic studies ▪ Inspection items compliant with US Pharmacopeia & European Pharmacopeia to validation function.	**2 Nos.**

		▪ Double beam optics with Czerny – Turner mounting for high energy throughput and high quality monochromatic light ▪ Low-Ray-Light diffraction grating technology ▪ Wavelength range: 1,100 nm to 190 nm ▪ Spectral bandwidth over entire wavelength range: 1 nm ▪ Wavelength accuracy: $\pm$0.1nm for D_2 peaks 656.1 nm ▪ Wavelength repeatability: $\pm$ 0.1nm ▪ Wavelength slew rate About 14,500 nm/min ▪ Photometric range: -4 to +4 Abs and 0 to 400 %T ▪ Photometric Accuracy: $\pm$ 0.002 Abs at 0.5 Abs ▪ Photometric Repeatability: $<\pm$0.0002 Abs at 0.5 Abs ▪ Baseline stability: $\pm$0.0003 Abs/h (700 nm) ▪ Baseline flatness: $\pm$0.0006 Abs over entire wavelength ▪ Ultra low Photometric noise: < 0.00003465 Abs (700 nm) ▪ Wavelength display: 0.1 nm increments ▪ Provision for data files transfer and saving in text format, MS excel format and any other suitable software format ▪ Upgradable to accessories like Thermoelectrically Temperature Controlled Cell Holder, Multi-Cell Sample Compartment, Film Holder etc. Large sample compartment. ▪ Detector : Silicon photodiode ▪ 2 Pairs of quartz cuvettes of 10 mm path length (Free of Cost) ▪ Specifications Brochure should be available on the Manufacturer,s website of UV-Vis Spectrophotometer. ▪ Warranty: 3 year on-site	

Deputy Registrar
(Store & Purchase)

Annexure -E

Sr No.	Name of Item	EMD Amount
Mass Transfer Lab		
01	Crystalliser	4000.00
02	Mass Transfer with Reaction set up	4000.00
03	Vapour Liquid Equilibrium set up with Standalone Frame	3000.00
04	Gas Diffusion set up with Digital Microscope (Software Operated)	4000.00
05	Liquid Diffusion set up	4000.00
Petroleum Lab		
01	Petroleum Product Distillation Apparatus ASTM D-86	2000.00
02	Ash Content Determination Apparatus	2000.00
IPA Lab		
01	Laboratory Oven	1000.00
02	Muffle Furnace	3000.00
03	Respirable Dust Sampler	1500.00
04	BOD Incubator Cum Orbital Shaker	2000.00
05	Nephelometer/Turbidity Meter	2000.00
06	Bench top DO and BOD Meter	2000.00
CRE Lab		
01	Batch Reactor	2000.00
02	Plug Flow Reactor	2000.00
03	CSTR in Series	3000.00
04	R.T.D. Studies in Plug Flow Tubular Reactor Setup	2000.00
05	Recycle Packed Bed Reactor Setup	3000.00
06	Annular UV-Photo Reactor Peristaltic Pump Feed System	3000.00
07	PH Conductivity Meter	2000.00
Heat Transfer Lab		
01	Thermal Conductivity of Metal Bar Apparatus	2000.00
02	Experimental Set-Up For Thermal Conductivity of Insulating Powder Material	2000.00
03	Critical Heat Flux in Saturated Pool Boiling Apparatus	2000.00
04	Thermal Conductivity of Liquid	2000.00
05	Apparatus for Heat Transfer Through Agitated Vessel	2000.00
PDC Lab		
01	Flow Control Trainer	4000.00
02	Level Control Trainer	3000.00
03	Pressure Control Trainer	3000.00
04	Non Linear Level Control	4000.00
05	Temperature Control Trainer	3000.00
06	Cascade Control Trainer	2500.00
07	Desktop Computer	2000.00
MTO Lab		
01	Centrifugal Pump Test Rig (Variable speed with DC motor & drive, All tanks with SS 304)	2000.00
02	Reciprocating Pump Test Rig (Variable speed with DC motor & drive, All tanks with SS 304	2000.00

All Common Labs		
01	Weighing Balance	8000.00
02	Muffel Furance	2000.00
03	Universal Oven	3000.00
04	Double Distillation Unit	4500.00
05	Orbital Shaker Incubator with Temp. Controller	4000.00
06	pH-EC-TDS-ISE meter with electrodes for pH and EC-TDS	3000.00
07	UV-Vis Spectrophoto Meter	20000.00

Note: Any Bidder may quote for one item or both items as the case may be. In this case, if a bidder quote for more than one item, he may furnish only one DD calculating the EMD Amount of the quoted items. However kindly ensure that the envelope containing DD towards EMD should have specified the tender no. and name of item/items for which they have quoted and furnished EMD

Deputy Registrar
(Store & Purchase)