

UNIVERSITY INSTITUTE OF ENGINEERING & TECHNOLOGY

**Sector 25, PANJAB UNIVERSITY, CHANDIGARH.
(PHONE Nos. 0172-2541242, 2534995, 2534996, 2534997)**



TENDER NO. : UIET/PU/Equipment/2011/23

LAST DATE FOR RECEIPT : 08-07-2011 by 10.00 AM

DATE & TIME OF OPENING : 08-07-2011 by 11.00 AM

PRICE RS. 500/-

UNIVERSITY INSTITUTE OF ENGINEERING & TECHNOLOGY
Sector 25, PANJAB UNIVERSITY, CHANDIGARH.

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TENDER DOCUMENT FOR PURCHASE OF SOFTWARE/EQUIPMENTS

TENDER NOTICE NO. : UIET/PU/Equipment/2011/23

DUE DATE : **08-07-2011 by 10.00 AM**

DATE AND TIME OF OPENING : **08-07-2011 by 11.00 AM**

NAME AND ADDRESS OF : _____
TENDERER _____

TELEPHONE NUMBER, FAX : _____
AND E-MAIL ADDRESS OF _____
THE TENDERER

TENDER PURCHASE DETAILS :

- (i) In cash Rs. 500/- (Amount deposited in State Bank of India, Panjab University, Chandigarh Current Account No. 10444979507 Vide Scroll No. _____ Dated _____)
- (ii) Rs. 500/- by (If the Tender Downloaded from internet) Demand Draft No. _____
- (iii) Rs. 600/- by Demand Draft No. _____ Dated _____
Name of Bank: _____ Amount: _____ (if required by post)

EARNEST MONEY DETAILS:

- (i) In cash = 2% of the estimated cost of material (deposited vide University Receipt No. _____ Dated _____)
- (ii) By Demand Draft No. _____ Dated _____
Name of Bank: _____ Amount: _____
- (iii) By TDR/CDR No. _____ Dated _____ Amount _____

INDEX

1. Invitation for Bids, General Rules, Terms & conditions for Tender	4-7
2. Procedure for submission of Bids	8-9
3. Technical Specification of Equipment/software for Labs	
a. Electrical and Electronics Lab	10-15
b. ECE Lab	16-19
c. Computer Science	20-21
d. Project: DRDO	22-23
e. Mech. Lab	24-29
f. workshop	30-31
g. Biotech	32-38
h. Information & Technology Lab	39-48

SECTION – I

Invitation for Bids, General Rules and Terms & Conditions for Tender

1. This invitation to tender is for the supply of different type of equipments for use by the students in various laboratories in UIET, Panjab University. The tender is liable to be rejected because of any misrepresentation by the firm.
2. The requirements of the Institute in terms of category of Software/equipment, detailed specifications and quantity are given in the enclosed list. Any change in the terms which are beneficial to the University can be carried out before the opening of the commercial bids.
3. The tender documents (non-transferable) should be purchased from the institute by depositing the amount in cash with the State bank of India, Panjab University, Chandigarh, in C/A No.10444979507 and a receipt obtained for the same. In case, the tender document is obtained by post by sending a demand draft, favouring the Director, UIET, mentioning therein the DD Number and date in the space provided on the previous page. Tenders will be rejected in case the tender document has not been purchased from the Institute and in case of downloading from Internet, if draft of Rs.500/-is not attached.
4. Tenderers are advised to study all pre-qualification, technical and commercial aspects carefully of the tender document. Submission of Tender shall be deemed to have been done after careful study and examination of the Tender Document with understanding of its implications.
5. Sealed offers prepared in accordance with the procedure enumerated in Clause 1 of Section II, giving full detailed specifications of the equipment, should be submitted to The Director, UIET, Panjab University, not later than the date and time laid down, at his address given in the schedule for invitation to Tender.
6. The categories of items and quantity indicated in the Tender Document are tentative. Director, UIET, reserves the right to increase or decrease the quantity or delete some or all of the items depending on the needs of the institute without assigning any reasons. Other

departments of the University can also place orders for the supply of the equipment/material/software mentioned in this tender document on the rates once finalized. Repeat orders on the rates finalized can also be placed with the successful /approved firms.

7. The tenderer should indicate specifically the Basic Price, Custom duty/Excise duty, other duties (if any), and levies chargeable quantitatively against each item. No additional information will be entertained after due date. Director, UIET, may reject tenders if they do not carry such information separately and specifically quantitatively.
8. The bids should indicate clearly that the rates are F.O.R. UIET, P.U., Chandigarh.
9. **The tender should be submitted in Three cover system i.e. a, b and c. There should be proper indication of the contents on each envelope as indicated in clause 1.1 of section II.**
10. In case the Earnest Money is paid by Demand Draft/TDR, the draft/TDR must be in a separate sealed envelope indicating the amount, tender Notice Number and due date and enclosed with the bid.
11. The tenderer should clearly indicate the delivery period and validity period of tender, which in no case should be less than 90 days.
12. The tenderer should clearly indicate the availability of service and maintenance facilities at Chandigarh for the items quoted.
13. The above mentioned details particularly the VAT, Sales Tax, custom duty/excise duty, any other duty/tax, if not quoted properly, the bid can be cancelled.
14. **The tenderers are required to quote for each item separately in terms of basic price and all other charges.** Prices can be quoted in Indian as well as in Foreign Currency.
15. The Tender should be submitted alongwith Earnest Money @ 2% of the estimated quoted price in the shape of Draft/Term Deposit/Call Deposit Receipt **valid for a minimum period of 6 months** in favour of Director, UIET, PU, Chandigarh. In all cases the interest of the UIET should be safeguarded, if in any case at a later stage the EMD is required to be forfeited because of non-supply/non-providing of demonstration and for any other fault of the firm. **Tenders not**

accompanied by Earnest Money or incomplete in any respect will be rejected outright.

16. The Tenderer must indicate the list of prominent institutions /organizations particularly in and around Chandigarh, where the same equipment has been supplied during the last three years.
17. The Tender must be submitted along with the copies of :
 - Manufacturers license or authority from the manufacturer
 - Latest Income Tax Clearance Certificate
 - Sales Tax Registration Certificate
18. **The Director, UIET, Panjab University, Chandigarh reserves the right to reject any or all tenders without assigning any reason whatsoever.**
19. The tenders will be opened on the date and time indicated in the presence of tenderers if any present on the occasion. If the date of opening is declared to be a holiday the tenders will be opened on the next working day. **The University will not be responsible for any delay in the submission of the tender document by the postal authorities/courier companies, which is received after the last date/time.**
20. **No advance payment or payment against Performa invoice will be made. 90% payment will be made after receipt ,inspection, installation/testing on certification by the concerned teacher/Lab Incharge. Balance 10% payment will be released after satisfactory performance. The firm can be asked to give the demonstration of the equipment even before the order is placed with it.**
21. In case, the item(s) is/are to be imported for supply, irrevocable letter of credit will be opened with the Bank/SWIFT payment will be made. The Institute's Banker is State Bank of India, Panjab University, Chandigarh. **In case the AWB is supplied late by the firm, the demurrage levied, if any by the Airport authorities will be borne by the firm.**
22. All damaged or unapproved goods shall be returned at the Tenderer risk and cost and the incidental expenditure thereupon shall be recovered from the concerned party.

23. Printed conditions of the firm sent alongwith the quotation, if any, shall not be binding on us.
24. Packing list must be put in all packages.
25. All charges e.g. packing, freight, insurance etc., if payable, in terms of Tendered quotation and accepted by us should be supported by voucher/money receipts etc.
26. On acceptance of tender, the date of delivery should be strictly adhered to otherwise the Director, UIET reserves the right not to accept the delivery in full or in part and to claim **liquidated damages @1% per month** of the value of the order unless extension has been granted by the Director, UIET, PU, Chandigarh specifically. In case the order is not executed within the stipulated period, the Institute will be at liberty to make purchases through other sources at the risk and cost of the defaulting firm, and forfeiture of the earnest money of the Tenderer besides claiming damages.
27. No claim on account of payment of octroi etc. within the limits of the Municipal Corporation, Chandigarh shall be accepted.
28. Payment of bill will be made through/by crossed account payee Cheque drawn on the State Bank of India, Panjab University, Chandigarh, on receipt of the articles in good condition. The decision to purchase of each item is taken independent of other items quoted by the firm. It is not binding on the institute to purchase all the items quoted by any particular firm.

SECTION – II

Procedure for submission of Bids

1. There will be three Cover System for this tender
 - a. Pre-qualification documents (in duplicate) in one cover.
 - Pre qualification will required
 - Sale Tax No.
 - I.T. clearance
 - Authorization from OEM if applicable
 - EMD draft/Call deposit receipt.
 - b. Technical Bid (in duplicate) in one cover.
 - c. Commercial bid (in duplicate) in one cover.
2. Each copy of the Pre-qualification document should be covered in a separate sealed cover super scribing the word: 'Pre-qualification document': Each copy should be marked as "Original Copy" and 'First copy'. Both should be put in a single sealed cover super scribing the wordings 'Pre-qualification document'.
3. Each copy of Technical Bid of the Tender should be covered in a separate sealed cover super scribing the wordings "Technical Bid". Each copy should be marked as "Original Copy" and "First Copy". Both should be put in a single sealed cover super scribing the wordings "Technical Bid".
4. Each copy of Commercial Bid of the Tender should be covered in a separate sealed cover super scribing the wordings "Commercial Bid". Each copy should be marked as "Original Copy" and "First Copy". Both should be put in a single sealed cover super scribing the wordings "Commercial Bid". Commercial Bid should only indicate prices (Preferably item-wise).
5. All the three documents viz. Pre-qualification, Technical Bid Cover and Commercial Bid Cover prepared as above are to be kept in a single sealed cover super scribed with Tender Number, Due date and the wordings "DO NOT OPEN BEFORE 11.00 AM on 08.07.2011.
6. The cover thus prepared should also indicate clearly the name and address of the tenderer to enable the Bid to be returned unopened in case it is declared "late".

7. Each copy of the tender should be a complete document and should be bound as a volume. Different copies must be bound separately.
8. The bids prepared by the Tenderer and all correspondence and documents relating to the bids, shall be written in English language and any printed literature furnished by the Tenderer written in another language must be accompanied by English translation, failing which, tender is liable to be rejected.

Electrical Engineering Department, UIET, Panjab University, Chandigarh				
Sr. No.	Item name and Specifications	Qty	Amount per Unit (In Rs.)	Total Amount (In Rs.)
1.	3 phase Rectifiers Input 3 Phase 415V, 50 HZ supply. DC output 0-220V, 20A	01		
2.	LCR meters 200H,200mico Farad,20M ohm Model new 954 MK-I	04		
3.	Kits To Perform Multi Basic Electronics Practical (Diode char. transistor char. zener diode char etc)	04		
4.	Synchronization of an alternator with infinite bus by (i) Dark lamp method (ii) Bright lamp method Machine requirements DC shunt motor 3HP/5HP, 220V directly coupled to synchronous generator 2KVA/3KVA severalty excited separately inbuilt in the panel. Synchronizing control panel for parallel operation of two alternator Control Panel: it consist of nicely powder coated M.S. fabricated box with screen printed circuit will be fitted on the panel with duly marked termination and also back door of the panel will have lock facility for safety of the panel. All the necessary accessories such as DC motor M.C. voltmeter 96x96sq mm, 0-300V-2 no., M.C. ammeter 96x96 sq mm 0-20A-2 no. Field rheostat 1.4A, 230 ohm-2 no., DPIC 16A, 240V-2 no. DC starter 3 point face plate type suitable for above motor 2 no. , indicating lights, insulting terminals For Generator: M.I. voltmeter 96x96sq mm, 0-500V-2 no. with voltage selector switch, M.I. ammeter 96x96 sq mm 0-5A-2 no. Frequency meter vibrating reed type 96x96sq mm 2no., phase sequence indicator 96x96sq mm- 1no.,bulbs with holders -6 no., triple pole double throw knife switch-I set, M.C.B 6A 3 pole-2 no., excitation controlling arrangement-2 no. power factor meter 96x96sq mm -1 no, insulating terminals for both machines, For DC exciter: M.C. voltmeter 96x96sq mm, 0-300V-2 no.,M.C.B. 6A double pole-2 no. terminals Operating manual must	01		
5.	Digital Trainer Kit ST2611 Technical Specifications: Breadboard : 172.5 mm × 128.5 mm Tie points : 1685 DC Power Supply : +5 V /1 A, 5 V / 500 mA, +3 V to +15 V / 500 mA (variable), -3 V to -15 V / 500 mA (variable) Pulse Generator : Frequency range : 1 Hz to 1 MHz in 6 steps. Variable in between Amplitude : 3 V -15 V (CMOS), 5 V (TTL) Duty cycle : 50 %, TTL / CMOS Output Pulser Switches: 2 Nos. (Push to On) Data switches : 8 Nos. (Toggle switches for both TTL & CMOS) LED display : 8 Nos. (TTL/CMOS Mode) Seven Segment Display : 3 Nos Logic Probe : Logic level indicator for TTL/CMOS Power Supply : 220 V ±10 %, 50 Hz / 60 Hz on request Power Consumption : 3 VA (approx.) Weight : 3 Kg (approx.) Dimensions (mm) : W 340 × D 241 × H 105 Accessories included : Mains cord, Operating and Experimental	05		

	Manual (With more than 20 designed experiments.) Patch cords.			
6.	Power Factor Meter Digital LED display either red or green, auxiliary supply 230V AC, operating range- 0 to 1 (Lead and lag)	01		
7.	Substation Protection It provides various experiments on sub station operation & protection. The complete system developed is simulator based for the study of a substation having short, medium and long transmission line as incoming lines to the substation. Various meters of 96x96 mm sq.of good accuracy to provide the following: i) Voltmeter with selector switch at the sending and receiving end 0-500V: 2 no. ii) Ammeter in phase for measuring (a) line current under load condition: 0-5 A : 1 no. (b) no load current with bypass SC link 0-1A : 1 no.	01		
8.	GSM Trainer kit with Application module Feature: 1. Easy understanding of AT commands 2.Real Time operation 3.Description/Explanation/Visualization of the AT commands on one screen 4.Study of GSM real time working fundamentals 5.Appliances switching by SMS using AT commands 6.External antenna Technical Specification: 1.GSM capability: GSM900/1800,E-GSM 2.GSM data services: Asynchronous, (DCS 1800) Transparent & Non Transparent 3. Modes: 14.4kbits/s 4. EGSM sensitivity:<-104dBm 5. DCS sensitivity:<-102dBm 6. Dynamic Range: 63dB 7.Intermodulation: >-43dBm 8. Maximum O/P power: 33dBm+/- 2dB (EGSM) 9. Maximum O/P power: 30dBm+/- 2dB (DCS) 10.Minimum O/P power: 5dBm+/- 5dB (EGSM) 11. Minimum O/P power: 0dBm+/- 5dB (DCS1800) 12. Mains supply: 9V	02		
9.	Mobile Phone Trainer kit Feature: 1. Real Time Mobile operation 2. Expanded and open trainer 3. Full understanding of mobile phone working 4. Frequency measurement and band verification 5. TX/RX frequency measurement 6. Detail study of SIM operation 7. Switched faults 8. CD containing mobile phone working presentation Technical Specification: 1. Cellular system: EGSM/GSM900 2. Rx frequency band: EGSM 925...960 MHz GSM 900, 935...960 MHz 3. Tx frequency band: EGSM 880...890 MHz GSM 900, 890...915MHz 4. Output power: +5,+33dBm/3.2mW...2W 5. Channel spacing: 200KHz 6. Antenna: Loop type,50W	05		

	<p>7. Display: 84*48 pixels 8. On Board Section: Antenna, Keypad, SIM, Charging circuit, clock, user Interface, such as Buzzer, Vibrator, LEDs 9. No of test points: 41 10. No of switched fault: 25</p>			
10.	<p>CRO Operating Modes: Channel I, Channel II, Channel I & II alternate or chopped, X-Y operation 1:1, Add/Sub CH I \pm CH II, invert CH II. Vertical Deflection (Y) Bandwidth : DC -20 MHz (-3 db) Dc -28 mhz (-6 db) Rise time 17.5 ns (approx) Deflection coefficients : 12 calibrated steps 2mV/cm -10 v /cm (1-2-5 sequence) Accuracy : \pm 3 % Input impedance : 1 M ohm \simU 25 pf Input coupling : DC -AC- GND Maximum input voltage : 400 V (DC + peak AC) Time base : Time coefficients : 18 calibrated steps 0.5 μs/cm-0.2 s/cm (1-2-5sequence) with magnifier X 5 to 100 ns/cm with variable control to 40 ns /cm Accuracy : \pm 3 % (in cal position) Trigger system Modes : automatic or variable Source : CH I, CH II, ALT-CH I/CH II, Line external Slope : positive or negative Coupling : AC Sensitivity Int 5 mm. Ext 0.8 V (approx) Trigger bandwidth : 40 Mhz Horizontal Deflection (X) Bandwidth : DC -2 MHz (-3dB) XY mode : phase shift < 3 ° at 60KHz Deflection coefficients : 12 calibrated steps 2mV/cm-10 V/cm (1-2-5-sequence) Input impedance : 1 M. \simU 25 p F Component Tester Test voltage : Max 8.6 V rms (open) Test current ; max 8 m A rms (shorted) Test frequency : 50 Hz, Test circuit 10</p>	10		
11.	<p>3 MHZ Function Generator Specification: Waveform: square/ sine/ Triangular. Frequency : 10 Hz – 3 MHz in size ranges Amplitude : 0 -15v , Frequency: read out 4 digit counter.</p>	06		
12.	<p>1 MHZ Function Generator Specification: Waveform: square/ sine/ Triangular. Frequency : 10 Hz – 1 MHz in size ranges Amplitude : 0 -15v , Frequency: read out 4 digit counter.</p>	05		
13.	<p>Analog Breadboard Trainer Kit with built in dual power supply 1. It provides with more 2000 connections with wires or components leads of 0.3 to 0.6 mm diameter. 2. BUILT-IN POWER SUPPLIES</p>	05		

	<p>VARIABLE DC FIXED DC 0 TO +12 VOLTS / 0.2 A + 5V, 1 AMPS WITH LESS THAN 0.5 mV RIPPLE ± 15 V @ 1 AMPS, 0.5 mV RIPPLE AC POWER 0 10 15 20 - 25V AC/ 0.2A 3. Built-in sine wave signal generator with frequency range of 10 Hz to 100 kHz with 0 to 10 volts Amplitude. 4. Necessary standard components as plug-in elements to carry out the experiments are supplied along with kit General features: built-in led indicators, potentiometer 4 mm socket provided for taking measurements through ieee interface card for analysis with Computer. 6. Instructional manual with circuit diagram and experimental manual is provided along the kit. 7. Standard Accessories 1. A Instruction Manual 2. 2 mm Connecting jumpers: 10 Nos.</p>			
14.	<p>DC power Supply (Variable) 1. DC output: Min. Range 0-30V, 2A. Should have coarse and fine Controls. 2. Current Limit: 100 mA – 2A continuously 3. Setting Resolutions : Voltage : 10mV, Current : 5mA 4. Internal Resistance : ≤10m 5. Stability : ≤ 2.5mV at 30V/2A 6. Recovery Time : ≤ 50 Ω 7. Load Regulation : ≤ (0.05%+10mV) 8. Line Regulation : ≤ (0.05% + 5mV) 9. Temp. Co efficient : ≤ (0.05 +5mV/C) 10. Ripple & Noisy : ≤ 1mVrms 11. Display : 3 digit 7 segment LED indicator for voltage and current 12. Accuracy : + (1% + 1 digit) 13. Over Range Indication : LED indicator for Overload 14. Built-in overheat, over voltage, overload and short circuit protection 15.Should have proper insulation 16.Power Supply : 220V + 10% 50HzHz 17.Operation Manual</p>	05		
15.	<p>Digital Multimeter MECO Make <u>Features</u> 4½ digit LCD display (19999 counts) Large LCD for clear reading AC/DC voltage, AC/DC current, Resistance, Capacitance, Temperature, Frequency, Diode, Continuity, Transistor function. <u>Specifications</u> <u>DC VOLTAGE (Auto & Manual Ranging)</u> : 400mV, 4V, 40V, 400V, 1000V : ± (0.5% rdg + 4 dgt) on 400mV & 4V ± (0.7% rdg + 4 dgt) on 40V & 400V ± (1.0% rdg + 4 dgt) on 1000V Resolution : 0.1mV to 1V Input Impedance : 10MV on all ranges Overload Protection : 500V DC / 350V AC for 15 sec. on 400mV Range, 1200V DC / 800V AC on all ranges <u>AC VOLTAGE (Auto & Manual Ranging) 50-500Hz</u> : 4V, 40V, 400V, 750V : ± (1.0% rdg + 5 dgt) on all ranges except, ± (1.5% rdg + 8 dgt) on 750V Resolution : 1mV to 1V Input Impedance : 10MV on all ranges Overload Protection : 1200V DC / 800V AC on all ranges</p>	05		

	<p><u>DC CURRENT (Auto & Manual Ranging)</u> 400μA, 4000μA, 40mA, 400mA , 4A, 20A \pm (1.5% rdg + 4 dgt) 0.1μA to 0.01A < 0.7V on 200mA < 0.25V on 20A Overload Protection : 0.8A / 250V fuse on 400mA 20A / 600V fuse on 20A <u>RESISTANCE (Auto & Manual Ranging)</u> <u>Range</u> : 400V, 4KV, 40KV, 400KV, 4MV, 40MV, Accuracy : \pm (0.7% rdg + 4 dgt) on all ranges except \pm (1.2% rdg + 4 dgt) on 4MV, \pm (2.5% rdg + 4 dgt) on 40MV Resolution : 0.1V to 0.01MV Test Current : Approx 0.7mA on 400V, 0.1mA on 4KV, 30μA on 40KV, 4μA on 400KV Overload Protection : 500V DC/AC <u>CAPACITANCE (Auto Ranging)</u> Range : 40nF, 400nF, 4μF, 40μF, 100μF Accuracy : \pm (5.0% rdg + 10 dgt) Resolution : 1pF to 0.01nF</p>			
16.	<p>Software Cadence Orcad 16.2 license version (PSpice simulation software) OrCAD offers a total solution for your core design tasks: schematic- and VHDL-based design entry; FPGA and CPLD design synthesis; digital, analog, and mixed-signal simulation; and printed circuit board layout. What's more, OrCAD's products are a suite of applications built around an engineer's design flow—not just a collection of independently developed point tools. PSpice and PSpice A/D are just one element in OrCAD's total solution design flow.</p>	02		
17.	<p>Power System Simulation software</p> <ul style="list-style-type: none"> • Platforms supported: Windows XP/ advanced version <p>It should have following features</p> <ul style="list-style-type: none"> • Load Flow Analysis • Short Circuit studies • Transient stability studies <p>The following are desirable: Transients Analysis of</p> <ul style="list-style-type: none"> ➤ Power lines & cables ➤ Large non-linear industrial loads ➤ Power electronic systems & drives ➤ Asymmetrical faults ➤ Distributed Power Generation ➤ Rotating machines ➤ FACTS/HVDC system <ul style="list-style-type: none"> • Power Quality Studies • Power Electronics Modeling and Design • Transmission Planning <p>* quote separately for each Toolbox **quote separately for 10 user license without media</p>	1		
18.	<p>D-Link switch for networking To provide networking to at least 5 computers for running PSpice software simultaneously.</p>	01		
19.	<p>Stepper Motor Study Model Stepper Motor Study apparatus to be designed for study of pulse sequence, direction / speed control and dynamics with built-in facility for microprocessor interfacing. The apparatus should be designed to study stepper motors basic operation including effect of external load which may be inertial or frictional. Provision to be made for free</p>	01		

	<p>running operation as also single stepping with LED indication. A calibrated dial for measurement of step angle. The unit to enable 7 to 8 experiments relating to the motor and be supplied complete with power supply control panel, 8085 based micro-processor kit and application software.</p> <p>Specifications: Servo potentiometer provide with 360° indication Modes : single stepping / free running / speed control / direction reversal. Torque : 2.8 Kg. – cm. Step Angle : 1.8° Micro-Processor System : 8085 based, 3 MHz. User Ram : 4 K. Key Board Display Controller : provided. Serial IO Lines : provided Detailed instruction manual</p>			
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ELECTRONICS AND COMMUNICATION ENGG, U.I.E.T, PU .CHD.				
S. No.	Equipment name	Qty	Amount per Unit (In Rs.)	Total Amount (In Rs.)
1	<p>OptSim: Optical Communication Simulator Upgradation of the existing OptSim to the latest version from 1user to 5 user with following Specifications</p> <ul style="list-style-type: none"> • Ease of use (GUI interface and commands) • Should be password protected • Provide signal summary after simulation at every output terminal of the system • Extensive built-in libraries for optical transmitters, Optical Switches/Cross-connects, channels, receivers of optical system models • Extensive graphics including 2D and 3D visualizations • Allow deterministic as well as stochastic parameter scans • Facility to zoom the schematic window with edit option.& ability to organize more components to reduce the size of working window • The results obtained from the simulation tool must be published in international journal/ conferences and must be experimentally proved • Design and performance evaluation of the optical communication systems e.g. Passive Optical Networks: BPON,EPON,GPON,WDM-PON, All-optical networks, DWDM, OTDM, OCDMA, Electronic Dispersion Compensation (EDC), FSO (Free Space Optics), Digital and Analog System, Radio over fiber. • Performance analysis in terms of BER, Eye diagram, Q Factor, Power spectrum, jitter, Spectrum Analyzer, Signal Analyzer and chirp etc. • Capable of performing operations for all type of amplifiers e.g. SOA, SOA with wavelength dependent gain, EDFA, Multi-pump Raman, Hybrid amplifiers systems, EYCDFA (erbium-ytterbium co-doped fiber amplifier) etc. • User defined optical fibers/systems with flexibility of change in parameters. (E.g. length, attenuation, wavelength, dispersion, amplifiers, linear and non linear phenomenon etc.) • <input type="checkbox"/>Linear and Nonlinear fiber simulation and assessment of countermeasures (e.g. All-order PMD, SPM, XPM, FWM, Stimulated Raman Scattering effect) • Capable of interfacing optical domain simulations with matlab • Simulation using split step Fourier method for real time systems • Monte-Carlo simulation to evaluate system parameters • Link optimization: power budget (due to variation in number of channels in optical amplifier chains and alloptical gain control techniques), Forward Error Correction (FEC) and Super-FEC, dispersion and power maps, optical eye analyses, tailoring of pulse shape and chirp, transmitter pre-emphasis, amplifier positioning • interface with active and passive photonic device design tools 	5 user		
2	<p>Qualnet Network Simulator</p> <ol style="list-style-type: none"> 1. Simulator should be a discrete event simulator and should be a full IP packet simulator. It should allow end user to run a full fidelity network including actual network protocol code. 2. Simulator should be structured on the 7 layer OSI Network Stack 3.The Simulator base license should run on a Dual core PC. Simulator should automatically split a large network to run over both cores or let the user customize how to do divide the network. Simulator should take care of all the parallelism requirements and enable the end user to take 	01		

	<p>advantage of the latest processors from Intel and AMD.</p> <p>4. Simulator should have the facility to scale to a Quad core/Opt Core in the future thereby facilitating distributed processing. Simulator kernel should be natively parallel and fully thread safe parallel to allow for full parallel execution with automatic partitioning. This will facilitate to simply add more hardware and processor licenses to quickly scale the simulated networks using more powerful hardware.</p> <p>5. Simulator should allow users to set up, develop, and run custom network models. It should provide feature rich visual development environment, thereby allowing users to set up models quickly, efficiently code protocols, and then run models that present realtime statistics and help packet-level debugging insight.</p> <p>6. Simulator should support IPV4 and IPV6 including interface level dual-stacks of IPv4 and IPv6.</p> <p>7. Simulator should provide support for modeling a large variety of networks, including WANs, LANs,PANs and abstract satellite networks</p> <p>8. Simulator should provide support for 802.11a/b/g/s and mobile ad-hoc networks (MANETS) to model large wireless networks of a wide variety. Simulator should run a network of over 3000 radios in real-time. Non-real time performance typically runs networks of thousands of radios/devices.</p> <p>9.Simulator should provide support for VOIP, queuing, scheduling, MPLS, and other Quality of Service capabilities</p> <p>10. Simulator should provide support for 802.16 and 802.16e, also known as WiMAX based on the IEEE 802.16-2004 and IEEE 802.16-2005 standards.</p> <p>11. Simulator should provide support for modeling GSM cellular networks, UMTS and abstract Cellular networks</p> <p>12.Simulator should provide support for IEEE 802.15.4 MAC and PHY</p> <p>13. Simulator should provide access to Source code of all the libraries/protocols that the end user procures to facilitate the end user to develop his own protocols/algorithms and device models</p> <p>14.Simulator should provide Multi-platform support viz: Windows, Mac OS X, Linux, UNIX</p> <p>15. Simulator should provide support for both GUI and command line access</p> <p>16. Simulator should provide support for Urban and terrain models</p> <p>17. Simulator should provide real time statistics The Dynamic API framework allows users to add real-time statistics with as little as 10 lines of code to monitor network conditions live.</p> <p>18. Simulator should provide 3D Visualizer capabilities to understand the network behavior.</p> <p>19. Simulator should support traffic generation models that are configurable by the user and also end user can import traffic, scenario, and trace files from external sources using HLA/DIS or socket interfaces.</p> <p>20. Simulator should support Via common scripting languages to perform Parametric Analysis without having to buy additional libraries or modules.</p>			
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3	<p>Visual TCAD and Genius Device simulator</p> <ul style="list-style-type: none"> • 2D/3D TCAD device simulator • Device structure drawing tool • Circuit schematic capturing tool • GUI simulation controller • Visualization tool of simulation results • Spreadsheet • X-Y plotting tool • Visual TCAD (GUI) • Drift-diffusion solver • Lattice temperature • Energy balance solver • 2D mesh, 3D mesh • Optics (FEM/Ray Tracing) • Circuit and Device simulation, Parallel computation. • Perpetual License 	05		
4.	Quad core Workstation with 6 GB RAM	05		
5.	UPS 600VA	25		
6.	<p>Laptop Intel® Core™ i5 greater than 3.0 GHZ Intel Mother Board or OEM Mother Board Intel Chipset or better 15.6" WXGA LED display Genuine Windows® 7 Professional, 64bit, English 16X DVD+/-RW Drive 4GB Dual Channel DDR3 SDRAM at 1066MHz 320GB - 7200RPM, SATA Gigabit Network Port, Wirless LAN, Bluetooth, HDMI port Certification: Should be certified for UL, FCC,CE, and Win Logo for Windows and Linux Certifications Warranty: 3 years onsite Comprehensive</p>	05		
7.	<p>Antenna design software IE3D</p> <ol style="list-style-type: none"> 1) Based on full wave 3D Methods of Moment (MOM) Platform 2) The built-in, powerful EM structure editor has a flexible input mode in both 2D or 3D. The editor also provides full support for major CAD formats, such as GDS, DXF, and ACIS Adding to efficiency, IE3D-SSD also includes an automatic mixed mesh (rectangular and triangular cells) to model structures of arbitrary shapes with minimum computational effort. 3) Built-in optimization and parameterization/fastEM schemes 4) Automatic magnetic current formulation enhances usability 5) Unlimited number of layers and ports Finite dielectric or different dielectric portions within the same layer 6) EM and circuit co-simulation of structures with active devices or lumped elements 7) Lumped element equivalent (RLC) extraction 8) Turn s-parameters into time-domain response using MD-Spice 	01/05		
8.	<p>20-Sim</p> <p>20-Sim is modeling and simulation software to model and simulate the behavior of dynamic systems, such as electric, mechanical, or hydraulic systems, including computer control loops.</p> <p>20-Sim contains model libraries with domain oriented components, block diagram and bond graph elements.</p> <p>The libraries present:</p> <p><input type="checkbox"/> Electric</p>	01/05		

	<ul style="list-style-type: none"> <input type="checkbox"/> Hydraulic <input type="checkbox"/> Thermal <input type="checkbox"/> Mechanical <input type="checkbox"/> Block Diagrams <input type="checkbox"/> Bond Graph <input type="checkbox"/> Simulation Algorithms <p>Key Features of 20-Sim:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Rapid system modeling through iconic diagrams, block diagrams, bond graphs and equations <input type="checkbox"/> Fully observable, unlimited hierarchical model structure <input type="checkbox"/> Active support of top-down, inside-out and bottom-up modeling. <input type="checkbox"/> Multiple libraries with a large set of domain-oriented models <input type="checkbox"/> Inspect any library model and change it for your own use <input type="checkbox"/> Save models for reuse, or archive models for easy distribution <input type="checkbox"/> Add graphical elements (lines, arrows, rectangles, text and bitmaps) to your models <input type="checkbox"/> Advanced simulation algorithms with high simulation speeds <input type="checkbox"/> Import and export of data to MATLAB, also during a simulation run <input type="checkbox"/> Full support of units to improve model reuse between si and non-si based countries <input type="checkbox"/> Parameter sweeps <input type="checkbox"/> Parameter optimization <input type="checkbox"/> Sensitivity analysis <input type="checkbox"/> Monte carlo analysis <input type="checkbox"/> Variation analysis <input type="checkbox"/> ANSI-C code generation <input type="checkbox"/> Numerical and symbolic linearization of non-linear simulation models. <input type="checkbox"/> 3d animation <input type="checkbox"/> Linear system editor for continuous-time and discrete-time linear models <input type="checkbox"/> Filter editor <input type="checkbox"/> Controller design editor <input type="checkbox"/> B-spline network editor <input type="checkbox"/> Cam wizard <input type="checkbox"/> Motion profile wizard 			
9	Air conditioner window type 2.0 ton Capacity with stabliser Make LG/ Hitachi/ Voltas with voltage stabilizer (with copper wiring)	25		
10	Projector	02		

COMPUTER SCIENCE & ENGG, U.I.E.T, PU .CHD

S.No.	Name of Item	Qty	Amount per Unit (In Rs.)	Total Amount (In Rs.)
01	Rack for IBM Server- System x3550 Rack Height 42U Rack Depth 1000mm Rack width: 800mm Minimum Four Fan Tray on top, 4-Fan Position, with Fans Mouse, keyboard tray, Monitor Tray Power Distribution box 12 Nos(5amp points) Vertical Cable Manager Vertical 42U Adjustable Shelf Nuts and Srews KVM Switch Minimum 8USB ports with 8KVM Cables Warranty: 1year onsite comprehensive	01		
02	MSDN Academic Alliance for CSE Labs Full Version with 3years Subscription	01		
03	IDL 8.0.	05 user license		
04	Qual Net 5.0.-Research License including all Research Libraries	02 user license		
05	Antivirus for 2 Years Features: Centerally Management in Office Network, Core Protection,PC Optimization,Internet Protection Operating Support: Windows XP Home/Professional/Windows XP Professional 64-bit Windows 7 Starter/Home Basic/Home Premium/Professional/Enterprise/Ultimate (32-bit and 64-bit),Window 2003/2008 Server	400 user license		
06	Network Switch • Minimum 24 ports (10/100 Mbps) Layer 2 Managed Switch with at least two 1000 BaseT SFP Ports •MAC Address tables size: Minimum 8K •Switch Fabric: Minimum 8.8 Gbps switching capacity •Transmission method: Store-and-Forward •Spanning Tree Support •VLAN support •Access Control Lists •Single IP Management Interface Option •RJ-45 •SFP Network Management Module Console RS232 Port, Web-based/ Telnet SNMP Compatible Port Mirroring Network Protocols and Standards IEEE 802.3 Ethernet, 802.3u, 802.3ad, 802.1d, 802.1w, 802.1s, 802.1p, 802.1Q, 802.3ad, 802.3x, 802.1x Data Transfer Rate Fast Ethernet: 200 Mbps (Full duplex)Gigabit Ethernet: 2000 Mbps (Full duplex) Protocol:CSMA/CD Warranty: 3 years onsite comprehensively.	03		

07	Wireless Access Point-Indoor Warranty: 1Years onsite Comprehensive.	03		
08	Wireless Access Point-Outdoor Warranty: 1Years onsite Comprehensive.	02		
09	Crossbow Sensor Classroom Kit	01		
10	Cable Kit- Cobber	01		
11	Cable Kit-Fiber	01		
12	Bluetooth Tool Kit	01		
13	Portable Network Analyzer & Tester	01		
14	Server Specification: Processor Quad-Core Intel® Xeon® 2.0 GHZ or higher Intel Chipset 5000 or higher Mother Board : Intel or equivalent OEM Mother Board No of Processor Min 2 No's 4MB L3 Cache RAM 8 GB DDR2 ECC or higher RAM Expandability Min 16 GB or higher RAID Controller: RAID 0, 1, 5 or higher SAS Controller Hard Disks: 4 X 3.5" SAS (15K RPM): 146GB DVD Writer 16X or higher NIC Integrated 10/100/1000 Mbps Wake-On LAN Supported Ethernet Card – 2 no's Standard keyboard Optical scroll mouse Form Factor Full ATX Cabinet (Tower) Diagnostics LEDs to identify failed components within the subsystem System Management Software OEM server management software to be provided Operating System Support Windows all version and Linux all version 17" TFT WXGA or higher Warranty: 3 Years onsite Comprehensive.	02		
15	Router Secure connectivity with Stateful Inspection Firewall and IP Security (IPSec) VPN support 4-port 10/100 Fast Ethernet managed switch with VLAN support and two WAN Network Port Load Blancing, Easy setup, deployment, and remote management capabilities through Web-based Warranty: 3 Years onsite Comprehensive. tools	02		

For Project: Development and characterization of polycarbonate and glass CNT with specific reference to energy absorption and pressure sensing characteristics

S. No	Description	Qty	Amount per Unit (In Rs.)	Total Amount (In Rs.)
1	<p><u>Low weight Universal Testing Machine(Electromechanical Servo Control Universal Testing Machine)</u></p> <ul style="list-style-type: none"> • Frame Capacity 0.1KN • Load Cell capacity 0.1KN • Standard accuracy type: Accuracy of test force is better than $\pm 0.5\%$ within the range 1/1~1/50 of full scale of load cell • Load cell: High precision tension/compression load cell as standard • Load amplification: x1, x2, x5, x10, x20, x50, x100 seven scales with auto range function, resolution 1/2000 • Test speed range: Servo Motor type: 0.005~1000 mm/min with Accuracy of $\pm 1\%$ or better. • Effective Test depth: 125 mm (distance of clamping center to column side) • Crosshead working table: standard type: 750 mm • Test stroke: standard type: 560 mm • Over travel & overload protection function: Stroke up & down position protection setting, when test force exceeds 10% of full scale, system auto stop to protection the system from overloaded • Power 0.5 kVA; 1ϕ, 220 VAC, 50/60 Hz <p>Computer Measuring System – Control & Edit Setting Functions Basic control mode: Basic control mode contains fixed velocity, fixed displacement, constant load speed, fixed load, constant stress speed, constant strain speed</p> <p>Free control mode: Free control mode switching, contains displacement \geq, displacement \leq, load \geq, load \leq, yield point, break point, stress \geq, stress \leq, stress \geq, stress \leq.</p> <p>Additional Settings and modes Available to freely set up cyclic mode, Define cyclic times, Conduct the next stage of control mode after the preset cycle is up, Mode set up for tensile and compression, Control mode database management, available to repeat editing and setting. Control mode can cover most international test standards like GB, CNS, ASTM, ISO, DIN, JIS, and so on Low frequency testing.</p> <p>Accessories:</p> <ul style="list-style-type: none"> • 1 set - compression plates of dia. 75mm; 1 set of tensile grips of capacity 0.1KN; 1 no. Tool kit; 1 set Operational Manual • Digital weighing balance of with a weight measuring capacity in micrograms up to 500gm • Laptop compatible with universal testing machine having 4GB RAMS, 320GB HDD, Intel i3 	01		

Tender No. 23, University Institute of Engineering and Technology, Panjab University, Chandigarh

	processor, upto 16" screen. <ul style="list-style-type: none">• Coloured Laser Printer compatible with universal testing machine having 9600 x 600dpi• All standard genuine software.			
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Includes installation, commissioning and one year international warranty and all freight handling airport, insurance, CFR value (airport) etc, Charges for equipment and accessories may be mentioned separately. Clearing from airport and transportation to University Institute of Engineering & Technology(UIET), Panjab University, Chandigarh, FOR to University Institute of Engineering & Technology(UIET), Panjab University, Chandigarh. One year warranty, atleast two visits for one year and after the expiry of warranty period, AMC for two year. **Rates should be inclusive of all taxes and duties and F.O.R** University Institute of Engineering & Technology(UIET), **Panjab University, Chandigarh**

Mechanical Branch, UIET, PU Chd

Sr. No	Name of item and Specification	Qty	Amount per Unit (In Rs.)	Total Amount (In Rs.)
1.	<p>INVERTED TRINOCULAR METALLURGICAL MICROSCOPE</p> <p>Trinocular observation head of these microscopes should be equipped with binocular siedntopf inclined at 30 degree and phototube for photomicrography.</p> <p>TRINOCULAR OBSERVATION HEAD :</p> <ul style="list-style-type: none"> • Revolving trinocular tube inclined 30° • Phototube for photomicrography. • Diopter adjustment ring on ocular tube. • Interpupillary distance from 54mm to 75mm <p>EYEPIECE</p> <ul style="list-style-type: none"> • Wide field eyepiece 10X (Paired) FOV 20mm <p>OBJECTIVES INFINITY CORRECTED</p> <ul style="list-style-type: none"> • DIN Long Working Distance Plan Achromatic 4X • DIN Long Working Distance Plan Achromatic 10X • DIN Long Working Distance Plan Achromatic 20X • DIN Long Working Distance Plan Achromatic 40X • DIN Long Working Distance Plan Achromatic 100X (Dry) <p>MECHANICAL BODY</p> <ul style="list-style-type: none"> • Polarize unit: Analyzer 360°rotatable, Polarizer and Analyzer can be moved out optics path • Co-axial focusing system with large knobs, pre-focusing lever & tension adjustment ring • Reverse Angle quadruple nosepiece on ball bearing. • Mechanical stage is 160mmX250mm. • The Mechanical stage has low positioned co-axial controls on ball bearing guide ways. <p>ILLUMINATOR</p> <ul style="list-style-type: none"> • The reflected light illuminator has 6V-30W halogen lamp, adjustable brightness. • 6V/30W Halogen tungsten bulb. <p>STYRO FOAM Molded Pack.</p> <p>MAGNIFICATION 40X-1000X.</p>	One		
2.	<p>CCD DIGITAL CAMERA</p> <p>Pick up device 1/2" CCD. Pixels: 795(H) X 596(V) Digital Signal processing device Automatic white balancing Resolution more than 480 TV lines. Dimensions: 43.5(W) X 44.0(H) X 64.5(D)mm, with C-Mount</p>	One		
3.	<p>Image analysis Software</p> <p>Image editing ,view, image filters, measurements, count and classification, particle measurements, phase volume fraction, nodularity, porosity, coating thickness, decarburisation, grain size, non-metallic inclusion, graphite flakes, grain cracks, dendritic arm spacing, silicon particle, printing facility</p>	One		
4.	<p>Double Disc Specimen Polishing Machine</p> <p>No of disc: - 02</p> <p>Disc Diameter : -Two discs of 8 inch each</p> <p>Motor Capacity/ Drive : ½ hp high torque motor</p> <p>Supply :15 Amps, 230V, Single Phase with all standard accessories & consumables suitable for specimen preparation for metallographic studies.</p>	One		

	<p>Speed : - Continuous step-less variable speed upto 1400 rpm with digital RPM indicators.</p> <p>: -Water faucet, built in sink arrangement.</p> <p>: -Heavy duty warm air dryer for immediate specimen drying.</p> <p>: -Etching reagent, consumable storage front racks</p> <p>: -Anticorrosive thick FRP Top</p>			
5.	<p>Specimen Cut-off machine</p> <p>Cutting capacity: up to 100 mm</p> <p>Cutting speed: 2000 & 3000 RPM</p> <p>Motor Rating: 3 HP, Single Phase 220 V, 50/60 Hz</p> <p>Cutting Wheel Size : 300 mm diameter & 2 mm thick Aluminum oxide cutting wheel</p> <p>Accessories :Abrasive wheels for hardness 55 to 65 HRC, 35-45 HRC, 25-35 HRC</p> <p>Cutting Operation : Automatic</p>	One		
6.	<p>Specimen Mounting Press</p> <p>Manually Operated Hydraulic Metallographic Mounting Press</p> <p>Specifications</p> <p>: - 1/ 1.5" diameter Mold Assembly</p> <p>: - Built in timer</p> <p>: - Pressure Gauge</p> <p>: - Heater</p> <p>: - Cooler Block</p> <p>: - Thermometer</p> <p>- Mould capacity 1000W</p> <p>- Mould heater mould with Internal cooling system</p> <p>- Digital temperature/ timer control & display</p> <p>- Hydraulic Actuation with digital Pressure reading</p> <p>- Coolant tank with automatic Pump ON/OFF system.</p>	One		
7.	<p>Belt Grinder</p> <p>Motor: - 1/2 - 1 HP, 220V, Single Phase</p> <p>Endless belt dim – 100 × 915mm</p> <p>- Dynamically well balanced rollers</p> <p>- Enclosed model with water faucet for intermediate rinsing of specimen for avoiding heating / burn formation.</p>	One		
8.	<p>Heat treatment Furnace Muffle Furnace Specifications:</p> <p>Chamber size : - 9 inch x 9 inch x 18 inch (Min required)</p> <p>Max Temp. Range : - 1500°C</p> <p>Power : - 230 V, 50 Hz</p> <p>Rating : - 6 KW</p> <p>- With digital temperature controller cum indicator.</p> <p>- Light weight with Ceramic wool insulation</p> <p>Accessories : - (a) Pyrometer (85mm diameter)</p> <p>(b) Silver thermal fuse 1500 °C</p>	One		
9.	<p>Jominy End Quench Apparatus</p> <p>Special furnace with DTC</p> <p>- Thyristor Controlled panel to avoid temperature overshooting.</p> <p>- No. of tests carried out at a time : 3</p> <p>- Quenching fixture designed strictly as per BS/SAE with specifications like 45° angle of top plate, quenching distance, jet stopper release just before quenching etc.</p> <p>- Motorized water circulation with storage & test tank.</p> <p>- Hardness testing fixture for progressive hardness indentation.</p>	One		

10.	Resin Bonded Abrasive Cut Off Wheels <table border="1" data-bbox="269 226 875 344"> <tr> <td data-bbox="269 226 472 285">200 x 1 x 25.4</td> <td data-bbox="480 226 675 285">250 x 1.5 x 25.4</td> <td data-bbox="683 226 875 285">300 x 2 x 25.4</td> </tr> <tr> <td data-bbox="269 289 472 344">350 x 2.5 x 25.4</td> <td data-bbox="480 289 675 344">432 x 3 x 25.4</td> <td data-bbox="683 289 875 344">500 x 3.5 x 25.4</td> </tr> </table>	200 x 1 x 25.4	250 x 1.5 x 25.4	300 x 2 x 25.4	350 x 2.5 x 25.4	432 x 3 x 25.4	500 x 3.5 x 25.4	One		
200 x 1 x 25.4	250 x 1.5 x 25.4	300 x 2 x 25.4								
350 x 2.5 x 25.4	432 x 3 x 25.4	500 x 3.5 x 25.4								
11	Abrasive Cutting Oil With rust resisting additive, suitable for all abrasive cut off machines.	5 Ltr. Can								
12	Abrasive Grinding Belts (A)Dry endless silicon carbide belts. Size: 4"x 36". Grit 60, 80, 120 or fine & coarse (B)Dry Aluminum Oxide Belts. Size: 4" x 36". Grit 60, 80, 120	10 each								
13	Abrasive Grinding Papers Superior wet / dry Silicon carbide abrasive papers. Plain / P.S.A. (pressure sensitive adhesive) back, as per U.S. standard. Papers 9" x 11" Grit - 80, 120, 180, 240, 320, 400, 600, 800, 1000 Round Discs - 8" (200 mm) dia. Plain / PSA backed Grit - 80, 120, 180, 240, 320, 400, 600, 800, 1000 Round Discs 10" (250 mm) dia. Plain / PSA backed Grit - 80, 120, 180, 240, 320, 400, 600, 800, 1000 Round Discs 12" (300 mm)dia. Plain / PSA backed Grit - 80, 120, 180, 240, 320, 400, 600, 800, 1000	1 doz								
14	Abrasive Powders These powders are available in fine particle sizes and are used with water as suspension medium. Silicon Carbide : Grits - 120 , 240 , 320 , 400 , 600 , 1000 Chromium Oxide 15 microns (Approx.) Magnesium Oxide 5 microns (Approx.) Aluminium Oxide 20 microns (Approx.) Aluminium Oxide 4 microns (Approx.)	500 g								
15	Polishing Cloths Synthetic fiber flocked on flexible water proof carrier, can be used with 1/4 - 3 micron diamond compound. (Plain / Self Adhesive) <ul style="list-style-type: none"> • Synthetic flocked on flexible cotton carrier, Used with 3 - 6 micron diamond compound (Plain / Self Adhesive). • Synthetic flocked on a flexible cotton carrier. A more heavy duty cloth for use with 6 - 9 micron diamond compound. (Plain / Self Adhesive). • Silk Cloth-for napless polishing application • Billiard cloth-for general/coarse application. 	10 each								
16	Alumina Polishing Suspension (Universal grade) Lavigated Alumina suspension for routine ferrous and non ferrous laboratory applications.	500 g each								
17	Finite element analysis software The finite element program should analyze the nonlinear dynamic response of structures. it should have constitutive models to simulate a whole range of engineering materials and error-checking features It should simulate the physical behavior of 2D and 3D structures: nonlinear dynamics, thermal, failure, contact, quasi-static, Eulerian, Arbitrary-Lagrangian-Eulerian (ALE), Fluid-Structure-Interaction (FSI), Multi-physics coupling, etc. The software should be able to simulate impacts on structures explosions or high-velocity impacts, Explosive forming,	01 (NO. of Licen ses – 25)								

	<p>process engineering, accident reconstruction, vehicle dynamics, thermal brake disc analysis or nuclear safety to investigate the behaviour of materials like composites, ceramics, concrete, or wood. It should also support analysis of biomechanics, human modelling, molecular structures, casting, forging, or virtual testing.</p> <p>The software should have following features:</p> <ul style="list-style-type: none"> Nonlinear Dynamics Parallel Processing (SMP, MPP) Rigid Multi-Body Dynamics Quasi-Static Simulations Fluid Dynamics Eulerian Capabilities Arbitrary Lagrangian-Eulerian Fluid-Structure Interaction Meshless Methods Underwater Shock Element-based Failure Analysis Design Optimization Structural-Thermal Coupling Adaptive Remeshing Implicit Capabilities Statics/Transient Linear/Nonlinear Eigenvalue Analysis 			
18	<p>PORTABLE SURFACE ROUGHNESS TESTER</p> <p><u>Detector</u> Measuring range: 800µm Resolution: 0.000125µm (on 8µm range)</p> <p><u>Drive unit</u> Straightness/traverse length : 0.5µm/50mm Standard : ISO, DIN, and ANSI standards, and JIS. Evaluation Parameters Ra, Rq, Rz, Rz(JIS), Ry, Ry (DIN), Rc, Rpi, Rp, Rpmax Rvi, Rv, Rvmax, Rti, Rt, R3zi, R3z, R3y, S, and many other related parameters Cut off length: 0.025mm, 0.08mm With Automatic data handling features and Printer.</p>	01		
19	<p>ROUNDNESS Measuring Machine</p> <p><u>Rotational Accuracy:</u> <u>Vertical drive unit</u></p> <p>Radial Direction $(0.02 + 5H/10000)\mu\text{m}$ $((0.8+0.5H)\mu\text{inch})$; H = probing height above turntable Axial direction $(0.02 + 6X/10000)\mu\text{m}$ $((0.8+0.6X)\mu\text{inch})$; X = distance from the turntable axis</p> <p><u>Rotational speed</u> 2, 4, 6, 10rpm <u>Effective table diameter</u> 235mm (9.25") <u>Centering/leveling adjustment</u> Automatic <u>Centering range</u> ±3mm (0.11") <u>Leveling range</u> ±1° <u>Maximum table loading</u> 30kgf</p> <p><u>Traverse speed</u> 35mm/s (1.37"/s) maximum for positioning; 0.5, 1, 2, 5mm/s (0.02, 0.04, 0.08, 0.20"/s) for measuring</p> <p><u>Maximum probing depth</u> 26mm (1.02") for ø12.7mm (ø0.50") 104mm</p>	01		

	(4.09") for ø32mm (ø1.27") <u>Detector</u> Measuring force 7-40mN Stylus tip shape/material Range Standard ø1.6mm (ø0.06") ±400µm (±0.015"), tungsten carbide ±80µm (±3149µinch), ball ±8µm (±314µinch) (Z-axis column unit) 0.15µm/100mm (5.9µinch/3.93") (λc2.5)0.25µm/300mm (9.9µinch/11.81") (λc2.5)			
20	Micro hardness tester (Knoop) Test Forces (0.098, 0.246, 0.49, 0.98, 1.96, 2.94, 4.90, 9.80) N (10, 25, 50, 100, 200, 300, 500, 1000) gf Carriage Control: automatic (loading / holding-up of the load / unloading) Amplification of the microscope: 100X, 400X Dwell Time of the Test Force: (5-60)s Min. Graduation Value of the Testing Drum Wheel: 0.0625um Testing Field: 1HV-2967HV Dimension of the XY table: 100 X 100 mm Movement Field of XY Table: 25 X 25 mm Max. Height of the specimen: 70 mm Max. Width of the specimen: 95 mm Light Source: cold light source Power Supply: 110V/220V,60/50Hz Dimension: (425 X 245 X 490) mm Weight: 30Kg With Main Accessories	01		
21	MICRO HARDNESS ANALYSIS SOFTWARE Automatic analysis of hardness with tabular results and Effective case Depth Graph.	01		
22	DIGITAL OSCILLO-SCOPE 100MHz, , 1GSa/s, 2ch digital oscilloscope Bandwidth : 100MHz Number of channels : 2 Simultaneous maximum Sampling rate/ch : 1 GSa/s Max. record length : 2500 pt/sec Min. vertical sensitivity : 2 mV/div Max. vertical sensitivity : 5 V/div Maximum input voltage : 300 Vms Display type : CRT Monochrome Physical dimensions : Height: 151.4 mm(5.96 in) Length: 120.7 mm(4.75 in) Weight: 1.5 kg(3.3 lb)	01		
23	Z-NC ELECTRICAL DISCHARGE MACHINING (EDM) (Z AXIS NUMERICALLY CONTROLLED) Work tank internal size (W x D x H): Approx. 800 x 500 x 350 mm Work table dimensions: Approx. 550 x 350 mm. Table Traverse (X, Y, Z): 300, 200, 250 mm. Feed Motor (in Z axis): DC Servo Maximum Working current: 45-50 A ±5 A. Dielectric capacity: approx. 400 litres. PULSE GENERATOR: TYPE MOSFET	01		

24	WEAR AND FRICTION TEST RIG Type :Pin/ball on disc type Pin size: 6mm Ball diameter :10mm Disc size:165x8mmthick Sliding speed :0.05m/s Normal load :200N	01		
25	LATHE DYNAMO-METER Piezo Based Computerized ** The other specifications include: * X direction measuring range: 0 - 3000 N (0.1N sensitivity) * Y direction measuring range: 0 -2000N (0.1N sensitivity) * Z direction measuring range: 0 - 2000N (0.1N sensitivity) * Measurement: X, Y & Z direction force measurement simultaneously * Data recording : Available * Data printing : Available * Signal conditioner : GPDS signal conditioner * Accuracy : 0.5% traceable to National Physical Laboratory * Computer interfacing card : GPDS (High speed) * Computer : P-IV Original intel with color monitor, without printer * Software : LT Lathe tool software exclusively designed and developed for measuring forces in X, Y & Z direction during turning	01		

Workshop of UIET, PU, Chd

Sr. No	Name of the item and Specification	Qty	Amount per Unit (In Rs.)	Total Amount (In Rs.)
1.	GEARED PILLAR DRILLING MACHINE Maximum drilling capacity in steel 24mm, no of spindle speed is 8 , range of speed 90-3600 rpm, machine throat distance column to spindle centres 250mm, table moment 500mm, maximum distance spindle to table 800 mm, drilling septh spindle travel 165mm, table size square 350x 350 mm, diameter of pillar 88mm, height of pillar 1500mm, spindlw adaptor mt3, electric moter one hp (so,em/crompton greaves)withmachine lamp, sleeve, drill chuck, arbor,driftkey, motor pulley and belt, set of spanner extra accessories:- electric moter one hp3 phase, vice two , tapping attachment, coolant pump and tank with pipe	01		
2.	BENCH GRINDER DOUBLE ENDED Motorised bench grinder equipped with ac induction motor 3 phase 415 v extra attachment: pedstal stand, eye shiled, coolant pump, one set extra(coarse&fine) wheel	01		
3.	Vertical Milling Machine, All Geared, Color - Grey T- slotted table clamping area 1350*310 mm. Table transverse longitudinal x cross x vertical 800 x 265 x 400 mm Vertical Feed 4 to 200 mm per min. Longitudinal & Cross 16 to 800 mm per min. spare arbor with complete assembly Vertical quill movement 70 mm No. of speeds = 10 to 18 No. of Feed = 10 to 18 Feed - Automatic / manual equipped with Limit switches. Heavy duty universal machine vice = 8" Setting dog arrangement with table for Automatic feed. Motor - Crompton Greaves / Bharat Bijli (spindle & Feed) Side & Face index able milling cutter dia = 35mm, 65 mm one each with steel & cast iron grade inserts - 20 each(with torx key) All part should be leveled & marking should be engraved Warranty - One year required. Noise level should be as good as that of reputed brand(60dB).Installation will be done by supplier. Tool Kit & Foundation kit to be supplied along with machine. Inspection lamp, operation & spare parts manual , wiring diagram manual to be provided. Accuracies - Spindle run out = 0.05mm, spindle square ness - 0.05mm up to 300 mm, table flatness - 0.05mm up to - 500 mm	One		
4.	Surface Grinder Color - Grey(gear driven) Max. cross * longitudinal travels : 160 * 475 Spindle centre height from table : 400 mm Grinding surface of table : 150 * 450 mm Hydraulic table feed (60 Hz) : up to 25 M/ min Hydraulic Motor : up to 1 HP/0.75kW Intermittent cross feed (elect-mech) appr : upto 0.15 to 7.5 mm/feed Continuous cross feed (elect-mech) appr : up to 1000 mm / feed 1 revolution/division of cross hand wheel : 5 mm / 0.02 mm Rapid vertical traverses : 220 mm / min Wheel dimension : 175 * 13(19) mm 1 revolution of vertical hand wheel : 1 mm 1 division of vertical hand wheel : 0.005mm Spindle Motor : up to 1.5 kW crompton or Bharat Bijli make Spindle r.p.m. at 50 Hz : up to 3600 rpm Magnetic clamping of Table	One		

	<p>Automatic Traverse setting limit switch Table Lamp, Grinding wheel, Dressing attachment & other accessories etc. Tool Kit & operation & spare parts manual with wiring diagram manual, Control Panel L&T make Installation & Commissioning is the responsibility of supplier One year warranty required</p>			
5.	<p>SEAM WELDING MACHINE Offered in 50 to 200 KVA capacity, available in longitudinal & circumferential versions. PLC, Precision built, sturdy design and robust construction suitable for training & projects. Capable of doing continuous & leak proof joints. Installation, Electrical Connection, Commissioning by the supplier. Manufacturer's warranty for minimum 2 years. Operator Manual, Tool kit to be supplied by supplier. One additional set of roller electrodes to be supplied. Digital Display of Voltage, Amperes & Settings (Time) etc. Standard Rating: 50,75,100,150 and 200 KVA</p>	One		
6.	<p>LATHE MACHINE Centre height -160 to180mm.Swing over bed-300 to350mm. Swing over cross slide-180 to 230mm.Distance between centre-400 to 600mm.Movement of cross slide-180 to 220mm.4-way tool post. Hardened & ground V-guides of bed .Hardened & ground lead screw & feed rod. Spindle bore up to -50mm, tail stock distance-40 to 60mm, travel-140 to 160mm, No. of speeds-08, range-60 to 1000mm,No. of feed-20 to 30, trueness of spindle w.r.t. bed -0.05mm up to 250mm traverse. spindle run out-0.08mm max. foot brake, coolant & splash guard fitment with machine, main motor-1.5 to 2.5HP.Make Crompton / Bharat bijlee. All parts should be leveled & marking should be engraved on machine parts. Warranty -01 year required, noise level should be low (i.e. 60dB) machine installation & commissioning supplier responsibility. All manual should be provided with machine. suitable boring & turning tool holders with each machine. Control panel L & T make with clock & anti clock wise rotation switch.</p>	Two		

REQUIREMENT OF EQUIPMENT/APPARATUS IN BIOTECHNOLOGY, UIET

Sr. No	Item Name	Qty.	Specifications	Amount per Unit (In Rs.)	Total Amount (In Rs.)
1.	Biosafety Cabinet	2	<ul style="list-style-type: none"> • Exceed Class 100 as per international standards • Vertical Laminar Air Flow 90 FPM \pm 20 FPM • Point to point scanned Hepa Filters having efficiency \geq 99.97% at 0.3 micron • Down flow through HEPA filter • From the Air Plenum, 70% air is recirculated through HEPA filter and 30% is exhausted through HEPA Filter • Air curtain effect with an average velocity of 100 FPM • Noise less than 65 db on 'A' scale • Power supply 220 V – single phase • Exhaust Air (30% through HEPA filter) • S.S. perforated work table (Front and back) • Clean Plexiglass. Front door, half fixed and half sliding • Light level exceeds 100 ft. candles in work area • Power consumption : 425 watts • body of 16 G Al. Sheet duly epoxy powder coated • The stand is made out of heavy duty M.S. pipes, duly epoxy powder coated • Hepa Filter are sealed to ensure zero leaks • Motor blower assembly is mounted on antivibration mounts for minimum vibration and noise • Cleanable and washable Pre filters • Exhaust plenum of CRCA sheet duly epoxy powder coated • Completely self-contained unit. Can function independently in uncontrolled area • Protects products, operator and environment • Positive pressure in the working chamber • Speed control for exhaust air • Working Area : 4'x 2'x 2 		
2.	Hot Air Oven	5	<p>Temperature range: ambient to 250°C. To work on 220/230 volts A. C. supply. Digital Temperature Controller and Indicator (\pm 1°C) Capacity: 300-350 ltrs The company should provide some spare parts and one year warranty.</p>		
3.	Deep Freezer (-80° C)	1	<p>External Dimensions 76.8 x 40.4 x HxWxD 34.1 in 195 x 102.5 x 86.7 cm</p> <p>Internal Dimensions 53.7 x 34.1 x HxWxD 24.2 in 136.5 x 86.5 x 61.5 cm</p> <p>694 lbs / 315 kg</p> <p>Capacity 25.6 cu ft / 725 L</p>		

			<p>Max. Box Capacity 504, 360, 216 2", 3", 4" boxes 3 No. of Insulated Inner 3 Doors No. of Shelves Temperature -50°C to -86°C at ambient temperature of +32°C</p>		
4	Polarimeter	1	<p>Principle: Automatic precision Polarimeter with optical null principle by rotation of the analyzer; automatic gain control. Radiation: Na spectral lamp (essential) and Hg high-pressure lamp. Different modes of measurements (i) Optical Rotation (ii) Specific Rotation (iii) Concentration Apertures: Selectable apertures for standard cells and micro cells. Prism: Glan-Thomson Prism Accuracy: $\pm 0.002^\circ$ for rotations $\leq 1^\circ$; $\pm 0.2\%$ for rotations $> 1^\circ$. Reproducibility: Better than 0.002°. Measuring Range: ± 89 Deg Arc. Changeover of one Wavelength to another: It should be automatic through Keypad. Auto zero setting: Electronically from instrument keypad at any desired position in the rotatory range. Temperature sensor: PT-100 temperature sensor for sample cells (optional accessory); temperature range-23° C to +198° C. Display: LCD screen/Digital Power requirements: 90 V to 132 V AC or 190 V to 264 V AC, 50 \pm 0.5 Hz or 60 \pm 0.5 Hz, 200 VA. Dimensions: 850 mm x 330 mm x 400 mm (WxHxD) approximately. Weight Approximately: up to 40 kg. Desirable: Should be supplied with IQ/OQ/PQ documents with two RS-232C Interface output and one Parallel Printer output. Faster operation 5 degs /sec ponce time. Should be capable of measuring samples up to 4.0 OD.</p>		
5.	Cone-plate Rheometer/V iscometer	1	<ul style="list-style-type: none"> - Should determine absolute viscosity of small samples(0.5-2.0ml) - Shear rates for determining a materials flow curve behavior - Capable of electronic gap adjustment - Rapid temperature control with embedded temperature probe in sample cup - Accuracy: $\pm 1.0\%$ of range. - Repeatability : + 0.2% - Additional cone spindles with lab stand - Capable of variable RPM adjustments - Digital read-out with the following data displayed ..Torque % ..cP(Centipoise) ..mPa.s(millipascal seconds) ..Shear rate ..Shaear stress ..Temperature °F/°C ..Output 	-	-

			0-1 Vdc chart recorder Analog-torque/Temperature ..Program features Data analysis with complete software The company should provide some spare parts and one year warranty.		
6.	Transport Cryocan (Liquid Nitrogen Container)	1	Capacity 51.50 lts. Neck diameter-51mm, Static evaporation- loss rate 0.43liter/day, static holding time around 200 days		
7.	Diffusion Cell apparatus	1	Material: Clear glass Specification: 02 cells arranged side bi side with provision for clamping a membrane in between them and at least one sampling port in each cell. Volume of cells: 3.4 ml, 5 ml. and 50 ml (in pairs). Orifice dia: 15 millimeters. Stirrer: 03 station stirrer to hold the cell assembly with clamps. Heater /circulator around the cell assembly with temperature control for working at temperatures other than the room temperature. Other: Teflon stoppers (06 nos), Gaskets (Teflon)-10 nos		
8.	Precision Balance	2	Dual Capacity, dual accuracy models, help indication on display to indicate overloading, high quality load cells ensure consistent performance, rugged stainless steel platform designed to withstand all environmental conditions , battery backup provided with all model, die cast aluminium based. Weighing capacity- 600gms Least count-10mg Platform size-112mm diameter The company should provide some spare parts and one year warranty.		
9.	Colorimeter	3	<ul style="list-style-type: none"> • Spectral Slitwidth 8 nm • Optical System Grating-based, 1200 lines/mm • Wavelength Range 325 to 1100 nm • Accuracy ± 2.0 nm • Photometric Range 0 to 125 % Transmittance : - 0.1 to 2.5 Absorbance: 0 to 1999 Concentration • Accuracy* 0.003 A from 0.0 to 0.3 A: 1.0% from 0.301 A to 2.5 A • Drift 0.003 A/hour • Stray Radiant Energy** < 0.1%T at 340 nm and 400 nm • Lamp Source Lifetime Approx. 1,000 hours • Standard Interfaces RS-232C and Centronics ports • Power Requirements 100/240 V ± 10 50/60 Hz $\pm 10\%$ 		
10.	Refrigerator	2	Standard 300 litres.		
11.	Vacuum Oven	1	Bench/cabinet/round electric vacuum oven Material-stainless steel Temperature range- 50°C-200°C (digital temperature controller) Pressure range- <1 >10 ⁻³ torr Capacity- 10-15 liters		

12.	USP dissolution tester	1	Paddle type USP dissolution apparatus with digital display test parameters like temperature, speed, sampling time etc. Temperature range: 20 – 45°C ± 0.2 °C Speed range: 25 – 250 rpm Power supply 220 V/50 Hz.		
13.	Weighing balance	3	Capacity: upto 200g Readability: 0.001g The company should provide some spare parts and one year warranty.		
14.	Rota vapor	1	The rotary evaporator principle is common method, towards efficient, fast and gentle way to separate liquids. The rotating flask produces effective heat transfer for fast evaporation and prevents local heating. Glass Assembly: Vertical condenser with shut-off valve Combined reflux and distillation process. Technical Specifications: Not more than 600 x 600 x 400 mm Approx weight 18 kg without water bath. Operating Voltage : 100-240 V Display for rotation and vapor temperature. Heating Bath: Weight upto 4 kg Dimensions not more than 250 x 150 mm Operating voltage: 220-240 V Power Consumption Approx 1300 W Temperature range: 20-200 °C approx. Vacuum Controller: Vacuum regulation for set pressure. Timer function. Simple menu control. Measuring Range: 1400-0 mbar Accuracy: +/- 2 mbar at a constant temperature. Any other specification equivalent or better than the mentioned specifications may be considered.		
15.	Autopipettes (1000, 100 & 10 µl)	2 sets	Variable volume pipettes to be used in Biotech labs Volume Adjustment. Desirable: Increments for 10 µl pipette: 0.02 Increments for 100 µl pipette: 0.10 Increments for 1000 µl pipette: 0.10		
16.	Oil Bath with temperature control	1	Suitable for a wide range of applications such as oxidation stability tests on oils, greases etc. or any other process requiring high temperature control. Temperature Range: 50-300 °C. Temperature Accuracy: +/- 20 °C. Adjustment for temperature settings with Dimer stat or variable auto transformer). Heater Industrial Grade. External cooling required for operation below 40 °C (Optional). Operating voltage: 220-240 V . Large capacity tanks for higher productions.		

17.	CO₂ Incubator	1	<p>Capacity : 160L-180L</p> <p>Temperature: 4°C above ambient to 50°C . Control +/- 0.1°C, Stability +/- 0.1°C, Uniformity +/- 0.3°C</p> <p>CO₂ Range : 0.2-20%, Control +/- 0.1% ,Stability +/- 0.2% Uniformity +/- 0.1%. Recovery up to 90% set point should not be more than 0.7% per minute</p> <p>HEPA Filter on CO₂ Inlet. Shelves should be perforated. Unique Six sided Direct heating system ensures stable temperature control, excellent Uniformity and rapid recovery with no overshoot. Built in system diagnostic. Fan less design. Large volume humidification's pan with dedicated independent heater. Incubator should have provision for High-Temperature Decontamination with a button for functioning decontamination the chamber using 120°C dry heat. During Sterilization CO₂ sensor should not removed making HTD Cycle efficient, rapid and effective. Infrared sensor for precise control of CO₂. CO₂ Sensor Auto-Zero: IR Sensor base line is reset to ensure accuracy without manual adjustment. 25mm Access port for additional probes and equipment to be used inside the incubator. Seamless chamber. RS232 Communication port. CO₂ Incubator should have provision to stack one over other. CO₂ Incubator should having at least 4 nos. perforated Shelf's. <i>Incubator should be supplied with CO₂ Cylinder and regulator.</i></p>		
18.	Inverted Tissue culture microscope with Phase Contrast Attachment	1	<p>Trinocular Microscope with</p> <ul style="list-style-type: none"> • Quadruple revolving nosepiece, equipped with Trinocular Head assembled from coated prisms and best quality optical components having full prismatic optical path. • Large specimen stage with extension plates. • Coarse and graduated slow motion knobs. • Variable intensity controlled built in base solid-state transformer. • 6V 20Watt Halogen bulb, illumination based on Koehler's system. • Phase contrast equipment having following optical combination with arrangements, in a storing cabinet. <p>Objectives: 4x, PH 10x, PH 20x and PH 40x. Eye Pieces: WF 10x (paired) and telescopic eyepiece.</p> <ul style="list-style-type: none"> • The unit should have heating stage with digital display to maintain temperature upto 50°C, having the accuracy of $\pm 0.3^\circ\text{C}$. 		

19.	Trinocular inverted microscope with fluorescence attachment	1	<p>OPTICAL SYSTEM CFI 60 INFINITY CORRECTED OPTICAL SYSTEM, PARFOCAL DISTANCE 60MM OR BETTER.</p> <p>EYEPIECE TUBE SIEDENTOPF-TYPE TRINOCULAR TUBE(Light distribution ,bino/photo:100/0, 0/100)</p> <p>NOSEPIECE QUINTUPLE NOSEPIECE, BACKWARD-FACING TYPE.</p> <p>PLAIN STAGE UNIVERSAL HOLDER TO ACCEPT ALL TYPES OF SPECIMEN HOLDERS</p> <p>ILLUMINATION PRECENTERED 6V-30W HALOGEN LAMP.</p> <p>FILTER 45MM NCB11, ND8 & GIF(Green interference).</p> <p>EYEPIECE LENS 10X(F.O.V 22MM) WITH DIOPTER ADJUSTMENT ON BOTH THE EYES.</p> <p>CONDENSER MODULATION CONTRAST/RELIEF CONTRAST CONDENSOR.</p> <p>OBJECTIVES MODULATION CONTRAST FLUORESCENCE OBJECTIVES</p> <p>PLAN ACHROMAT 4X,MODULATION CONTRAST FOR 10X,20X, modulation contrast and Plan Fluor 40X</p> <p><u>EPI-FLUORESCENCE ATTACHMENT</u></p> <p>EPI-FLUORESCENCE WITH 130W MERCURY LAMP. FLUORESCENCE FILTER BLOCK FOR UV,BLUE,,</p> <p>COOLED CCD CAMERA: 2/3"CCD CHIP WITH NET RESOLUTION OF MORE THAN 5 MEGAPIXELS.A/D CONVERSION OF 12 BIT.PELTIER DEVICE :AMBIENT TEMPERATURE -20 .</p> <p>SOFTWARE:IMAGE ANALYSIS SOFTWARE. User friendly computer system configuration core i3.</p> <p>NOTE:MICROSCOPE,CAMERA,FLUORESCENCE,SOFTWARE TO BE FROM SAME MANUFACTURER FOR BETTER COMPATIBILITY.</p>		
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20.	BINOCULAR MICROSCOPE	5	SEIDEN TOP Binocular, Diopter arrangement, quadruple chick stopnose piece, WF 10x eye piece, Double plate system, Mechanical stage, Achromatic object 4x, 10x, 40x and 100x. Built illuminator system magnification 40x to 1000x. Standard accessories-spare Halogen Lamp-1 Blue glass fitter immersion oil. Dust cover.		
21.	WATER BATHS	4	Rectangular high precision water bath with proper insulation. Stirrer to maintain uniform temperature. Temperature from room to 100 °C. Heaters of immersion type, works on 220-230 volts AC. With accuracy of +/- 1 °C. Control panel with ON/OFF buttons. Approx. Dimensions: 500 x 400 x 400 mm.		
22.	WATER BATH WITH INCUBATOR SHAKER	3	Rectangular high precision water bath with proper insulation. Stirrer to maintain uniform temperature. Temperature from room to 100 °C. Heaters of immersion type, works on 220-230 volts AC. With accuracy of +/- 1 °C. Control panel with ON/OFF buttons. Approx. Dimensions: 500 x 400 x 400 mm. Oscillatory tray on rollers with shaking speed from 40 to 150 rpm.		
23.	MAGNETIC STIRRER	2	Medium size combined magnetic stirrer with heating mantle. Capacity 2 litre. Speed regulator. Max speed 1200 rpm. Supplied with Teflon coated magnetic stirring bars.		
24.	MINI GEL ELECTROPHORESIS APPARATUS	1	Analytical Polyacrylamide electrophoresis apparatus with: Basic unit (1 No.), rubber gasket fixed (1No.) , platinum electrode assembly removable (2Nos.), glass plates-notched & rectangular (2 sets), 7 well teflon comb 0.5 mm (1 No.), 1.00 mm (1 No.) & 1.5 mm (1 No.), Teflon spacers 0.5 mm (2 Nos.), 1.00 mm (2 Nos.), 1.5 mm (2 Nos.), clamp and screws (1 set), levelling screws (3 Nos.), lid (1 No.), connecting cord (2 Nos.) and instruction manual.		
25.	HOT PLATE	3	Electric hot plate (round)made of cast iron with heat control Switch. Rating 1Kw, 230 volts.		
26.	AUTOCLAVE	2	Made of stainless steel from inside. Made of mild steel duly painted with epoxy powder coating from outside. Fitted with automatic cut-off device for element for general safety and also fitted with device to adjust pressure between 15 to 22 PSI. Control panel for display of pressure and temperature.		
27.	FILTRATION ASSEMBLY	1	Membrane filter holder (47 mm) with capacity 500 ml. Lower chamber -500 ml capacity. Approx. weight: 5-6 kg. Motor: Rotation 1500 rpm. Vacuum pump: desired to handle vacuum applications with : Power: 220V 50 Hz. Current: 0.32 Amp. Pressure: -600 mmHg.		

Equipment Required for IT Labs, UIET

S.No.	Name/Description of Articles/Components	Qty.	Price per unit (in Rs.)	Total Amount (In Rs.)
1.	8051 BASED MICROCONTROLLER TRAINER KIT <u>System having the following features on board.</u> <ul style="list-style-type: none"> • System compatible with 14,16,20 and 40 pin microcontrollers and comes with AT89s8252. • System having the on board USB programmer and programming can be done without taking the microcontroller out. • Each ports of the microcontroller can be set to pull-up or pull down resistor. • System having feature of RS-232 interface with PC. • System having feature with switch selectable power supply for USB or via external. • System having feature on board 32 buttons for program development need. • System having feature on board 32 LED for display status of all pins of all the microcontroller at the same time. • On board potentiometer is available for testing A to D conversions and comparator. • Digital to analog converter on board. • System having feature of seven segment display on board. • System having feature on board digital thermometer measuring temperature from -55°C to 125°C using DS-1820(optionally). • On board A to D converter. • System having feature on board 2x 16 line in 8 bit mode LCD display. • System having the connector on board to connect the graphic LCD display and selectable contrast controller for graphic LCD and LCD. • System having feature on board all the 32 pins of I/O ports are available for the user for external interface. 	05		
3.	'C' Cross Compiler and Assembler for MCS-51 family. (Single User)	01		
4.	PC-Based MicroTutor, Simulator for MCS-51 family. (Single User)	01		
5.	PIC microcontroller trainer kit <ul style="list-style-type: none"> • The PIC microcontroller programmer should connect to the PC via USB. • This board should be usable with Assembly, C or Flowcode programming utilities. • The board should program most 8,14, 18, 28 and 40 pin flash PIC microcontroller devices' using the flexible programming software to be provided with PPP software. • Should provide clean access to all I/O lines on the relevant PIC micro MCU devices. • Should be compatible with all I/O devices listed below. • Should be usable as a programmer and as a development board. • Should program a wide range of PIC micro MCU devices. • Full suite of programming software should be available • RC or Crystal operation. • At least 5 I/O ports brought out on 9 pin DB9 connector. In-Circuit Debugging via MPLAB® ICD2. • The development board will be the platform for controlling the Actuator Panel.. 	05		

	<ul style="list-style-type: none"> Should have on board 16 individual LEDs, quad 7-segment display and LCD display USB programmer. Support PIC micro microcontrollers with A/D converters On-board sensors. A comprehensive range of external analogue and digital sensors available for project. Fully protected expansion bus for project work. All inputs and outputs available on screw terminal connectors for easy connection to Actuator panel.E-Blocks compatible with 2 E-Blocks connectors fitted to ports C and D. 			
6.	ARM PROGRAMMER AND DAUGHTER BOARD WITH FOLLOWING FEATURES:- <ul style="list-style-type: none"> The board should be a development tool for the AT91 SAM 7 microcontroller from Atmel. The SAM 7 is a 32 bit RISC device running at an internal frequency of 36MHz, and having 128k ROM and 32K static RAM as well as 2 USARTs, 4x 10 bit A/D converters and a native USB bus. The board should have 5 E-blocks ports and the processor itself be housed on a removable daughter board (Atmel ARM processors are only available in SMD technology) so that the ARM can be incorporated into custom PCBs. 32 bit RISC processor with 128K ROM and 32K SRAM USB programmable with boot loader 5 x E-blocks ports, 32 I/O lines Compatible with most I/O boards listed below. Native USB and SPI buses Removable crystal Should be compatible with FLOWCODE. 	02		
7.	AVR BOARD WITH FOLLOWING FEATURES:- <ul style="list-style-type: none"> ATMEL AVR micro-controller based board with USB programming facility and supporting all 20 and 40 PIN Flash AVR devices. Must have 4 ports each of which contain 8 I/O lines. The AVR device be clocked by a crystal which can be easily removed to insert a crystal of preferred frequency. The system must include 1 AVR in-system programmer and 2 AVR Multi-programmer boards System must have facility to interface with all I/O boards listed below.. Board should be compatible with FLOWCODE software. 	02		
6.	Ultimate FLOWCODE for PIC,ARM,AVR (10 USER) (Latest Version)	01		
7.	C compiler for PIC 16 Series(Single user)	01		
8.	LCD Board <ul style="list-style-type: none"> The display should be a 16 character, 2-line alphanumeric LCD device which be connectable to the PIC/AVR or ARM board via a single 9-way D-type connector. The LCD display should also receive data in a serial format on 5 data inputs. Compatible with most I/O ports on the microcontroller board. Should be compatible with Flowcode. 3.3 Voltage compatible. 	02		
9.	Stepper Motor Board <ul style="list-style-type: none"> Stepper Motor with Simple Full and Half step Output/action with coding strategy of Simple and half step, forward and reverse operating 5V DC, 15 degree per step, full step only. 	02		
8.	Keypad Interface Board <ul style="list-style-type: none"> Should have 4x3 keyboard that allows data entry into bus based 	02		

	<p>systems.</p> <ul style="list-style-type: none"> Should be compatible to Flowcode . Should be compatible to All the PIC/ARM and AVR boards. 			
9.	<p>RS-232 Interface Board</p> <ul style="list-style-type: none"> The boards should provide an RS232 interface which can be used to facilitate communication between PIC Microcontroller/AVR/ARM board with and third party devices like PC serial ports, mobile communications systems etc. Flowcode macros for driving I/ O board should be available. A set of jumper links be available which should allow the RS232 I/O board to easily be set for all PICmicro® microcontroller USART ports. Should facilitate RS232 communications between processors and a PC Should permit RS232 communications between processors and a modem 	02		
10.	<p>Bluetooth Interface Module</p> <ul style="list-style-type: none"> The board must contain a TDB BLU2i module. The class 1 Bluetooth module should have transmit power to give not less than 50 meters transmission range at a data transfer rate of 100Kbps. The module be programmable using the serial I2C protocol, with an AT command superset, and be interfaced to any microcontroller with a UART facility. The module should support a range of Bluetooth protocols including LAP, Data, and the headset profile. Should be Flowcode compatible 	01		
11.	<p>SD/MMC Card Reader Board</p> <ul style="list-style-type: none"> The board should allow investigation of flash multimedia memory cards by implementing serial communication protocols, specifically the SPI interface. The main function of this E-block should be to add the capabilities of storing and retrieving large amounts of data for use elsewhere in the system. A set of jumper links should be available which allow the Card Reader board to easily be set for all PICmicro® microcontroller SPI compatible devices. Should support <ul style="list-style-type: none"> SPI serial MMC interface Bi-directional voltage level shifter Storage compatible with IBM based computers. 	01		
12.	<p>RFID Interface Module</p> <ul style="list-style-type: none"> The RFID board should allow user to easily incorporate RFID tags into an electronics system. The board must include an RFID module that communicates to Mifare, Icode and Ultralight cards at a distance of up to 10cm, using the onboard antenna, at frequencies of 13.56MHz. The board should be supplied with 2 Mifare cards and 2 Icode cards for experimentation. The board should also be usable for use with Hitag type cards operating at 125 KHz. The board should be compatible to the PIC/ARM/AVR boards. 	01		

Equipment required for Wireless Lab

S. No	Name of Equipment	Qty	Price per unit (in Rs.)	Total Amount (In Rs.)
1.	GSM Development Board GSM Development module with 3 band communication (900,1800.1900) with on board Mini sim Card reader. FME Antena connector support. Operating status LED 8 nos.	05		

	<p>Onboard Handset audio interface , V.24/V.28 Interface on the connectors, Windows Drivers software for GSM Applications, On Board 89C51 Controllers RJ11 Connector for handset connection, Sim Card Holder , on board 16x2 LCD Display , 4 seven segment display with 2 on board relays for action. On board Buzzer ,with all port controller available . On board ADC and provision for temp sensor and wireless monitoring . User manual .Proper documentation, workbook, user manual. Applications / experimental Interface :- The system must be supplied with GSM Appliaction Modules for batter study and approach of programming Like</p> <p>a) GSM based dialing system with a 4x4 matrix keypad facility to dial/send an SMS b) Facility for Electronic Rolling Display using GSM technology for massage updates thru any cell phone , Demo programs/ windows software etc</p>			
2.	<p>Mobile Training Kit</p> <p>The system must be able to explore MOBILE applications 240 x 128 Graphical LCD, Video Tutorial and soft manual. Step by step training thru graphical Lcd. Facility for learning AT command SET thru LCD Display And 4x4 multiplexed keypad Alpha numeric keypad for AT Command set Fixed / variable SMS to any number thru keypad RS- 232 Serial interface GSM Frequency 850MHz Based on Processor Core: 89V51 DTM Decoder circuitry Programming software with serial port module GPRS Frequency: Dual-band EGSM 850/1900MHz Complaint with ETSI GSM Phase 2+ standard class 4 (2W @ 850/1900MHz) Enhanced Full rate and half rate (FR/EFR/HR), Dual Tone Multi Frequency (DTMF) Data: Asynchronous - non transparent up to 9.6 kbps Short Message Services (SMS): Text and PDU, Software Interface: General purpose RS-232 serial interface, remote control by AT commands (GSM 07.07 and 07.05), Serial Baud rate from 300 to 115200 bits/s, Auto</p>	05		

	Bauding (300 to 38400 bits/s),			
3	<p>Advance Bluetooth Development board</p> <p>Bluetooth Ver. 2.0+ EDR certification Transmit Power up to +18 dBm(class1) Hold, Sniff, Park, Deep sleep mode 3.0V to 3.6V operation,Full Bluetooth Data rate over UART and USB Support up to 7 ACL links and 3 SCO links Enhanced Data Rate(EDR) compliant for both 2Mbps and 3Mbps modulation modes Interface: USB, UART& PCM (for voice codec) Support for 802.11 Co – Existence, Module with Bluetooth stack Open field range of 10+ meters, Low current consumption for long battery life, 2.4GHz Frequency Hopping Spread Spectrum (FHSS) technology ensures Based on MCS51 processor at 11.0592 mhz clock, 64k Flash memory, 32 Digital i/o ,With real time clock , E2PROM 4K (support I2c bus)sample programs and experimental manual serial port.On board stepper motor interface, On board LCD display, On board relay & buzzer interface for switching devices through Bluetooth. With Bluetooth Dongle . The development system must support with additional Bluetooth Module to act as a electronic lock for secure premises with an activation based on Bluetooth paring. Bluetooth hardware modems , with lcd Display for adhoc network (5 nos)</p>	01		
4	<p>Wi-Fi (IEEE 802.11b) Application Kit</p> <p>PCMCIA wireless LAN card (IEEE 802.11b) 16 Bit socket for infrastructure and adhoc. Facility for RS232, 422, 8452 Ethernet conversion. Configuration monitoring tools through Ethernet. Configuration tools through Serial. AT command Set-Protocol support RFC2217, telnet com port control protocol. Wi-fi development board with access point. Compact Flash Wi-Fi Card , libraries , etc. RS-232 to Wi-Fi conversion, Wi-Fi scanner Based on MCS51 processor at 11.0592 mhz clock, 64k Flash memory, 32 Digital i/o With real-time clock , E2PROM 4K (support I2c bus) sample programs and experimental manual serial</p>	01		

	port.			
5	<p>Advance RFID Application System Cybase management software Support for Windows NT/2000/XP Database support MSQL Ethernet to RS232 485 converters The windows based software must support Hardware must be a processor based with Interface to windows Application Software for support to Wigand / RS484 / 232 Readers. 2 AMP Power Supply with Battery Charger RFID Reader of Range 8 – 10 cm With 2 Nos. of RFID Tag Cards for Identification RFID Libraries for Software Developments. Proximate Reader with 125 KHz Frequency Distance 5 cm – 15 cm RS 485 and Wiegand Interface Band 4800 to onwards Board Communication board 485 17 keys and 4 LEDs Facility to interface Wigand reader System should be based on MCS 51 Processor with open I/O Architecture Separate Programming Adaptor for Processor On board Relay for Real Activation of Physical Devices Buzzer Indication On Board Stepper Motor for movement control 16 x 2 LCD Display Module with 4 x 4 matrix keypad Single Channel A/D converter LM 35 Temperature Sensor.Facility for Real Time Signal stamping with DS 1307 On Board 4 k of E²Prom memory Facility for Digital Input / Output though 8 LED's. On Board Proximity switch Interface (Inductive / Capacitive) Proximate Reader with 125 KHz Frequency Distance 5 cm – 15 cm RS 485 and Wiegand Interface Band 4800 to onwards Board Communication board 485 17 keys and 4 LEDs Facility to interface Wigand reader</p>	01		
6	<p>TCP/IP Application Board The system must support different Protocols FTTP, SNMP, HTTP, Telnet. LED & switch interfaces 40 pin FRC connector with address, data and control signals TCP/IP RABBIT DEVELOPMEN</p>	01		

	<p>Tcp/ip core module, development board, dynamic 'C' CD etc 100-pin PQFP,RTL 8019 software compatible Built in 16k SRAM, on chip 64 K bytes ISP flash program memory 512 K of EEPROM With RTC 4 diagnostic LED pins with programmable outputs Supports PnP auto detect mode .Compliant to Ethernet II and IEEE8023 10 Base2, 10 Base T Supports Microsoft's Plug and Play configuration for jumper less mode Support Full-Duplex Ethernet function to double channel bandwidth Support For UTP, AUI & BNC auto – detect (RTL 8019As only) Supports auto polarity correction for 10 Base T Support 8 IRQ lines/ 16 I/O base address options Supports 16K, 32K, 64K and 16K page mode access.89C51RD2 MCU with, Etc. network module supporting TCP/IP 16 x 2 LCD interface to MCU 2 Relays interface for remote control 128x64 Graphical LCD Display The System should be based on a processor at 22 MHz With 10T Ethernet RJ45 Jack. The system should have 1 MB serial Flash for data 512 K Flash Memory Built in Web Server with host page development. Video tutorial with narration and mimic diagram must be provided.</p>			
7	<p>GPS Development System Falcom JP13, 20 channel GPS Receiver based on SiRF GSC3 chip ARM 7 baseband CPU with 8Mbits FLASH memory 200.000+ effective correlators and Integrated TCXO Protocol support for NMEA & SiFR Position accuracy < 10m (without DGPS) Extremely fast TTFF at low signal levels GSW3 software support and SiRFLoc multi-mode GPS support Position accuracy < 10m (without DGPS) P89C51RD2/P89C668 microcontroller prototyping module. 64KB on-chip FLASH. 512 KB external serial I2C-EEPROM.</p>	01		

8	<p>Mobile Training Kit</p> <p>The system must be able to explore MOBILE applications 240 x 128 Graphical LCD, Video Tutorial and soft manual. Step by step training thru graphical Lcd. Facility for learning AT command SET thru LCD Display And 4x4 multiplexed keypad Alpha numeric keypad for AT Command set Fixed / variable SMS to any number thru keypad RS- 232 Serial interface GSM Frequency 850MHz Based on Processor Core: 89V51 DTM Decoder circuitry Programming software with serial port module GPRS Frequency: Dual-band EGSM 850/1900MHz Complaint with ETSI GSM Phase 2+ standard class 4 (2W @ 850/1900MHz) Enhanced Full rate and half rate (FR/EFR/HR), Dual Tone Multi Frequency (DTMF) Data: Asynchronous - non transparent up to 9.6 kbps Short Message Services (SMS): Text and PDU, Software Interface: General purpose RS-232 serial interface, remote control by AT commands (GSM 07.07 and 07.05), Serial Baud rate from 300 to 115200 bits/s, Auto Bauding (300 to 38400 bits/s),</p>	01		
9	<p>Wireless Sensor Networking system</p> <p>Decodes of 802.15.4 MAC and ZigBee NWK/APS packets Comprehensive packet filtering This package provides complete knowledge to design and deploy Zig Bee protocol based low data rate wireless communication and remote monitoring & control applications using sensors. It enables you to learn about wireless sensor networking concepts & topologies. By using the powerful Xbee hardware tools you can develop ZigBee based in-house tracking applications. Zigbee software The system should be based on IEEE 802.15.14 with ISM2 with one</p>	01		

	<p>master coordinator and 5 End Devices (Zig Bee configured as per bellow specifications) with indoor and outdoor range 100-300. ZigBee Protocol Analyzer Software</p> <p>Log/replay facilities Basic Edition's protocol analysis with advanced visual analysis and measurements for wireless sensor network and application development.</p> <p>Zig Bee Master Coordinator The hardware processors 8/16 Bit based coordinator With max stream Zig Bee model Zig Bee based ISM- 2.4 GHz with integrated chip antenna Supporting various Network Topology with RF data rate 250 KBPS With software selectable Data rate, with input / output range 100Ft /300Ft. With power supply 2.8V. 8 Channel A/D, 8 Digital Input / Output, 2-PWM Output μ C with ISP features, 4K E2PROM on chip RTC. RTC with battery back-up. Two 12V relays with isolated O/Ps. Development 16X2 LCD display & seven segment display. 8 I/Ps from DIP switches. 8 O/Ps available on LED's With data monitoring on 240x128 Graphical Lcd Display , With 3 button menu based system . Zig Bee End Devices Zig Bee End Devices based on based on 8/16bit processor Zig Bee based ISM- 2.4 GHz with integrated chip antenna Supporting various Network Topology with RF data rate 250 KBPS With software selectable Data rate, with input / output range 100Ft /300Ft. With power supply 2.8V. 8 Channel A/D, 8 Digital Input / Output, 2-PWM Output With Zig Bee modules configured for End Devices Slaves. With 4 Dip switches, 1 Relay and Buzzer output, Battery Operated, 2 Complete port for output connections, 16 character LCD Display etc.</p>			
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	<p>Wireless Sensor Modules: Temp. sensor wireless module Magnetic Sensor Smoke Sensor PIR Sensors (ceiling mount , indoor , outdoor , periphery etc) Vibration & glass break sensor IR Sensor Product Manual/Sample Application in CD Accessories (USB cable & RS232 cable)</p>			
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