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DEPARTMENT OF PHYSICS
NOTICE INVITING E-TENDER

E-Tender is invited, by the Registrar, Cooch Behar Panchanan Barma University, for the Department of Physics, Cooch Behar Panchanan Barma University for supplying different instruments, by the eligible vendors. Interested vendors may follow the instructions as given below for submission of their tenders under online mode:

Sl. No	Description of Items	Quantity
1	Measurement of the Hall coefficient of a given sample and calculation of its carrier concentration	1
1.01	The setup should consist of following units. a) Hall probe Ge crystal n type b) Hall probe Ge crystal p type c) Hall probe mount (for 10 mm x 10 mm sample) d) Hall probe mount (for 5 mm x 50 mm sample) e) Hall probe multipurpose stand, 2 nos. f) Digital micro voltmeter, g) Constant Current Power Supply, h) Electromagnet i) Constant Current Power Supply, Digital Gauss Meter.	
2	To design and construct a stabilized power supply (Constant Voltage Source) using discrete devices and to study the variation of load voltage with load current. Show also the variation of load voltage with load current using IC 78XX.	4
2.01	Power Supply Trainer Equipment required to fulfill Experiment- 1. Digital Multimeter 2. Digital Storage Oscilloscope	
3	To design and construct constant – K type (a) low pass (b) high pass (c) band passfilters (using π section) and to study the variation of attenuation and phase constants of these filters with input frequency. Todetermine the cut off frequencies and to compare with theoretical values.	4
3.01	K-Derived Low Pass & High Pass Filter Trainer Equipment required to fulfill Experiment- 1. Analog Circuit Development Platform 2. Digital Storage Oscilloscope	

4	To study the variation of output voltage with frequency and load resistance for agiven class-B Push Pull amplifier and to obtain the variation of output power with frequency and load resistance.	4
4.01	Power & Differential Amplifier Trainer Equipment required to fulfil Experiment- 1. Digital Storage Oscilloscope	
5	To design and construct clipping and clamping circuits using diodes and to study the variation of output amplitude and wave form using CRO.	4
5.01	Clipper and Clamper Trainer Equipment required to fulfill Experiment- 1. Digital Storage Oscilloscope	
6	To design an astable multivibrator using BJT and to study its output waveform and frequency for various RC values. To study how the output can be converted to a square wave using clipping circuit.	4
6.01	Astable Multivibrator Transistoried Equipment required to fulfil Experiment- 1. Digital Storage Oscilloscope	
7	To design a Uni-junction Transistor circuit and draw its characteristic curves for different values of supply voltage. Use it as a saw - tooth wave generator and determine the frequency of oscillation.	4
7.01	Understanding Characteristics of MOSFET, FET & UJT Equipment Required to fulfil Experiment- 1. Analog Circuit Development Platform 2. Digital Storage Oscilloscope	
8	To design a circuit diagram and study the voltage gain, input impedance, and powergain of an emitter follower.	4
8.01	BJT Amplifiers and Emitter Follower Trainer Equipment required to fulfil Experiment- 1. Digital Storage Oscilloscope.	
9	To study the artificial transmission line (TL) at low frequency (<<1kHz) and to determine the line parameters of the given TL.	4
9.01	Transmission Line Trainer Kit Equipment required to fulfil Experiment- 1. Digital Multimeter 2. Digital Storage Oscilloscope	
10	To construct using OPAMP, (i) Differentiator (ii) Integrator (iii) adder-subtractor circuits. To study their performance for different time varyinginputs.	4
10.01	Operational Amplifier Lab Equipment required to fulfil Experiment- 1. Digital Multimeter 2. Digital Storage Oscilloscope	
11	To determine CMRR, input offset voltage, output offset voltage, input bias currentand slew rate of an OP- AMP.	4

11.01	Equipment required to fulfil Experiment- 1. Digital Multimeter 2. Digital Storage Oscilloscope	
12	To design and construct a Wein-Bridge oscillator using OPAMP and to study itsoutput waveform and frequency for various RC values.	4
12.01	Equipment required to fulfil Experiment- 1. Digital Multimeter 2. Digital Storage Oscilloscope	
13	To study OP-AMP as a function generator, i.e. as (a). square wave generator(b). triangular wave generator	4
13.01	Operational Amplifier Lab Equipment required to fulfill Experiment- 1. Digital multimeter 2. Digital Storage Oscilloscope	
14	To construct Half-Adder and Full-Adder circuits using logic gates and to perform some simple 2's complement Adder-Subtractor operations (Two decimal digits)	4
14.01	Adders and Subtractors Trainer	
15	a) To construct X-OR gate using NAND gates and to verify truth table. (b) To convert two inputs NAND gate to two input OR gate. (c) To construct NOR gate byusing other gates and hence verify the truthtable.	4
15.01	Universal Gates Trainer	
16	Determination of ultrasonic velocity in liquids using an ultrasonic interferometer.	2
16.01	The coated interferometer consists of : a) High Frequency Generator & Ultrasonic Oscillator Mains Voltage : 220 Volt, 50 Hz, Range : Single frequency, 2 MHz, accuracy 0.3%. Glow lamp / Pilot lamp 6.3V / 0.3A, Fuse 500 microA. b) Measuring cell containing precision micrometer on top side. Maximum displacement of the reflector 20 mm. Required quantity of liquid to be filled in the cell 1200 cc. Least count of micrometer 0.01 mm c) RF cable length of cable between Generator & Cell 50 cms. approx.	
17	Study of absorption lines of a substance using a Spectrograph	2
17.01	The setup should consist of Constant Deviation Spectrograph (calibration range 4000 A^0 – 7000 A^0, ± 10 A^0), Constant Deviation Spectrograph Prism (micro = 1.71) and Arc & Spark lamp with power supply.	
18	To study the spatial and temporal coherence of LASER using Michelson's Interferometer	2
18.01	a) To show Temporal Coherence : It should consist of Michelson Interferometer with least count 10^{-4}, Helium Neon Laser (Output Power 2.0 mW) with power supply, Stand for Laser b) Setup for Spatial Coherence.	
19	To study the characteristics curve of G.M. counter, and (a) to study the statistical fluctuation in cosmic ray background radiation, (b) to study the decay of activity of an artificially activated source, (c) to find out the gamma counting efficiency of G.M. tubes, (d) to study the gamma absorption in lead, (e) to study the beta absorption in Aluminum and hence to determine maximum beta energy.	4

19.01	It should consist of the following items : a) 6 digit GM Counter with built-in Power Supply b) End Window GM Detector (Halogen quenched) c) Stand for End Window GM Detector d) Aluminium absorber disc set. Experiment – to study the characteristics curve of GM Counter, to find out the gamma counting deficiency of GM tubes, to study the gamma absorption in lead, to study the data absorption in aluminium and hence to determine maximum data energy.	
20	To calibrate the given condenser and to determine the values of unknown resistance and capacitance	2
20.01	Requirement : a) Cathode Ray Oscilloscope b) Digital Storage Oscilloscope,	
21	To find out the dielectric constant of a liquid using a transmission line : Dielectric Constant kit for liquid.	2
21.01	Dielectric Constant kit for liquid	
22	To determine the excitation potential of a gas using Frank-Hertz tube.	2
22.01	Full set to run the experiment: The experiment should consist of the following : Argon filled tetrode Filament Power Supply, 3.6V to 4.3V continuously variable Power Supplies for V_{G1K}, V_{G2A}& V_{G2K}. Saw tooth waveform for CRO display Multirange Digital Ammeter	
23	Determination of Curie temperature of a ferromagnetic material	2
23.01	Setup for determination of Curie Temperature of a Ferroelectric material	
24	To study the optical absorption of a semiconductor and determination of its band gap.	2
24.01	Setup for the experiment	
25	Study of Zeeman Effect	2
25.01	Zeeman Experiment Setup, complete in all respect including 14” LCD Flat Panel Monitor and CCD Camera. The setup consists of the following : High Resolution Fabry Perot Etalon, FP-01 Mercury Discharge Tube, MT-01 Power Supply MTPS-01 Narrow Band Interference Filter, IF-01 Polarizer with Lens, PL-01 Optical Bench, OB-01 CCD Camera, CCD-01 Telescope with Focussing Lens, FL-01 Monitor 14”, TV-14 Constant Current Power Supply, Digital Gaussmeter,	
26	Determination of e/m ratio using a magnetron	2

26.01	Make e/m Experiment Setup,. The experiment done by measurement of electron charge to mass ratio based upon Thomson's method. The e/m tube is bulb-like and contains a filament, a cathode, a grid, a pair of deflection plates and an anode.	
27	Nitrogen Gas Generator	1
27.01		

Technology	Pressure Swing Adsorption (PSA) on carbon molecular sieve bed	
Nitrogen flow rate	1 L/min or higher at 5.5 bar	
Nitrogen purity	> 99.999%	
Noise level	< 55 dB	
Inlet /Outlet Connexion	¼ G (BSP) Female	
Special Features	(i) LCD display with indication of the model, inlet/outletpressure, hours run meter and PC statusLED (ii) Touch-screen LCD display to show output flow with purity level check (requires optionalsensor) (iii) Need to work in auto run mode in which the generator canbe programmed for auto-start andauto-stop (iv) Intelligent PLC controller to remind maintenance due and keep the servicerecord	
Accessories	(i) Suitable oil free compressor, (ii) A set of coalescing filter, silencer and air intake compressor filter, (iii) including two suitable pressure guages and pipes to connect with JASCO 4700 FTIR and tube furnace, etc.	
Warranty	Minimum two years (onsite comprehensive) warranty should be offered. Product support for period of minimum five years after warranty period to be ensured by vendor/supplier.	

28	Measurement of dielectric constant of a polar liquid as a function of temperature and determination of the dipole moment	2
28.01	Experiment Setup for Measurement of Dielectric Constant of Non-conducting Liquid. The setup consists of the following : Probes arrangement Sample – Benzene Digital Capacitance Meter The setup is complete in all respect.	
29	Measurement of the energy gaps of (i) silicon and (ii) germanium.	2
29.01	Experiment Setup for Study of Energy Band Gap and difuc, The setup consists of the following : 2 nos. 3 ½ digit DPM 2 nos. Fixed Frequency Oscillator Temperature Controlled Oven with Sensor, PNO-01 Sample – PNJ a) Cathode Ray Oscilloscope,	
30	Measurement of the coercive field and saturation polarization of a ferroelectric sample	2
30.01	The kit consists of ac power supply – 15V AC, output selectable using pot, circuit	

	diagram is printed on the front panel.	
31	Study of the characteristics of a photo-diode and calculation of its efficiency of energy conversion.	2
31.01	Photodiode Characteristics Apparatus.	
32	Determination of the transverse magneto-resistance coefficient of a given sample and finding the mobility of the carriers	2
32.01	Complete set to run the experiment.	
33	Determination of the concentration of colorcenters in an alkali halides crystal.	2
33.01	Experiment Setup for Determination of the concentration of colorcenters in an alkali halides crystal. The experiment setup should consist of the following : Sample KCL or KBr single crystal Thermoluminescence Temperature Meter, TL-02 Digital Thermometer with RTD sensor Oven Power Supply Sample Holder Thermoluminescence Oven, TLO-02 Black Box, TL-BBx Photomultiplier Tube 931A, TL-PMT High Voltage Power Supply, EHT-11 Digital Nanometer, DNM-121 The setup is complete with all respect except X-Ray Generator / Diffractometer.	
34	Oscillator	10
34.01	Function Generator 3 Hz to 3 MHz, microcontroller base Sine, Square and Triangular	
35	Desktop Computer Advanced	5
35.01	Desktop Computer Advanced • Touch All-in-One Desktop • Operating system: Windows 10 Professional 64-bit • Processor: 8th Gen Core i7, U Quad Core • Memory:16 GB PC4-17000 DDR4-2133 (17 GB/s), 2 DDR4 SODIMM Slots • SSD &Hard Drive: SSD M.2 2280 SATA Class 20 : 256GB, 2 TB SERIAL ATA III Hard drive; 600 MB/sec @ 5400 RPM • Graphics: 930MX (4 GB GDDR5 dedicated) • Optical disk drive: DVD-Writer • Display:23.8" Anti-Glare Touchscreen, IPS Full HD LED Display, 10-point Projected Capacitive Touchscreen, Full High Definition Display – Resolution: 1920 x 1080 (1080p); Brightness - 300 nits and Aspect Ratio – 16:9; Colour Gamut – 72% • Connectivity: Wired LAN - Integrated 10/100/1000 Gigabit Ethernet, Wireless LAN – Intel Dual Band Wireless – AC 3168 (802.11 ac) and PAN – Bluetooth 4.2 • Ports: 2 USB 2.0; 1 USB 3.0 Type-C™; 2 USB 3.0 • Input: Webcam - TrueVision HD camera Pointing device - Wireless Mouse (with nano dongle) Keyboard - Wireless Keyboard with volume control • Power supply type: 150 W external AC power adapter • Warranty: 3-year	

	Pre-installed software: Microsoft Office Home and Student 2016	
36	Laser Printer Monochrome	2
36.01	Laser Printer Monochrome • Print speed: Up to 20ppm • Print technology: Laser • Connectivity: Hi-Speed USB 2.0 port • Memory: 2 MB • Supports duplex printing Warranty: 3 years	
37	Laser Printer Colour	1
	Laser Printer Colour • Print speed black: Normal: Up to 20 ppm • Print speed color: Normal: Up to 20ppm • Print quality black (best): Up to 600 x 600 dpi • Print quality color (best): Up to 1200 x 1200 dpi • Print Resolution Technologies: ImageRET 3600 • Duty cycle (monthly, A4): Up to 40,000 pages • Direct print : From USB – Supported file type Tiff,JPG,PDF& XPS • Print technology: Laser with network • Processor speed: 800 MHz • Display: 5" color grahpic screen • Connectivity: Mobile printing capability, wireless capability, high speed USB port • Compatible operating systems: Windows® 10, 8.1, 8, 7: 32-bit or 64-bit • Memory: 2 GB • Paper handling input, standard: 550-sheet input tray 1-sheet priority tray • Paper handling output, standard: 250-sheet output bin • Maximum output capacity (sheets): Up to 600 sheets (10 mm stack height) • Duplex printing: Yes • Media sizes supported: Letter, Legal, Executive, A3,A4, A5, A6, B5 (JIS), B6(JIS), Postcard(JIS), Double Postcard(JIS), Envelope #10, Envelope Monarch, Envelope B5, Envelope C5, Envelope DL, A5-R • Power consumption: 1.5kva • Energy efficiency: ENERGY STAR® certified	
38	Over-head Projector	1
38.01	Complete set	
39	Design and construct Butterworth First order, second order and 4^{th} order Low pass, High pass filters. Plot the frequency response Plot the frequency response Plot the frequency response filters. Determine the phase angles and the cut off frequency.	2
39.01	Analog Circuit Development Platform <u>Equipment Required to fulfill Experiment-</u> 1.Digital Multimeter 2. Digital Storage Oscilloscope	
40	Using an IC-555 construct the following circuits and study them:	2

	(a) Astable Multivibrator (b) Schmitt Trigger (c) Saw tooth wave generator (d) Voltage Controlled Oscillator generator	
40.01	Equipment Required to fulfill Experiment- Digital Multimeter Digital Storage Oscilloscope	
41	Design and study the following properties of a positive voltage power supply using an IC 723. (i) Variation of output voltage with input voltage. (ii) Effect of load current on stabilized output voltage for two different line voltages. (iii) Same as (ii) when a series pass transistor 2N3055 is connected as a current booster. Determine the voltage stabilization ratio Sv, output resistance Ro.	2
41.01	Equipment Required fulfilling Experiment. 1. Digital Multimeter 2. Digital Storage Oscilloscope	
42	Design and study an amplitude modulator circuit using transistor and determine the percentage of modulation by (i) envelope method, (ii) trapezium method. (b). To construct a detector circuit for AM waves and study its performance.	2
42.01	AM Modulation Transmitter Trainer AM De Modulation Receiver Trainer Synchronous AM Detector Trainer Equipment Required to fulfil Experiment 1. Digital Storage Oscilloscope 2. 9KHz to 1.5GHz Spectrum Analyzer With Tracking Generator	
43	To detect frequency modulated waves using the IC phase-locked loop	2
43.01	PLL Trainer Kit Equipment Required to fulfil Experiment 1. Digital Storage Oscilloscope 2. 10MHz Function Generator	
44	To construct and study a four bit ripple counter. To construct and study a decade counting unit.	2
44.01	Counter Trainer	
45	Experiments on Fiber Optics: i. Setting up Fiber Optics analog link ii. Setting up Fiber Optics digital link iii. Intensity modulation system using analog input iv. Intensity modulation system using digital input v. Frequency modulation system vi. Pulse modulation system vii. Propagation loss in optical fiber viii. Ben ding loss in optical fiber ix. Measurement of optical power using optical power meter(OPM) x. Measurement of propagation loss using OPM xi. Measurement of Numerical Aperture xii. Setting up of FO voice link using Intensity Modulation xiii. Setting up of FO voice link using FM xiv. Setting up of FO voice link using PWM	2
45.01	Advanced Fiber Optic Trainer With FO cable & Optical Power Meter Equipment Required to fulfill Experiment 1. Digital Storage Oscilloscope	
46	Experiments with the 8085 microprocessor	2
46.01	Basic 8085 Microprocessor Trainer	
47	Microwave Experiments: (a) To study the characteristics of wave propagation in a waveguide by studying standing wave pattern and hence to plot ω-β diagram. (b) To verify relationship between guide wavelength λ and free space wavelength using a wave-guide slotted section (c) To study the mode characteristics reflex Klystron and hence to determine mode number, transit time, electronic tuning range (ETR) and electronic tuning sensitivity (ETS). (d) To study Gunn oscillator as a source of	2

	microwave power and hence to study (a) I-V characteristics, (b) Power frequency versus bias characteristics and (c) power-frequency characteristics. (e) To study the properties of E-and H-plane waveguide tee junctions and to determine isolations, coupling coefficients and input VSWRs. (f) To study isolation. Coupling coefficients and input VSWRs of an E-H tee or Magic tee. (g) To study E-plane and H-plane radiation pattern of a pyramidal horn antenna and compute (a) beam width and (b) Directional gain of the antenna. (h) To study the characteristics of a directional coupler. (i) To study the operation of a ferrite circulator and hence measure (a) insertion loss, (b) isolation (c) Cross coupling (d) Input VSWR at a given frequency and study their variation with	
47.01	Complete set in all respect	
48	Regulated Power supply 30V and 3 Amp max	5
48.01	Complete set	
49	Temperature Controller going upto 400 ^{0}C	4
50	Constant Current Source	5
50.01	Low current range 0-20 mA High Current range 20-500 mA For intermittent operation upto 1 A	
51	Signal Generator	10
51.01	From 30 Hz – 30 KHz	
52	DC differential amplifier 4 inputs	5
52.01	Complete set	
53	AC bridges: Maxwell's, de-Sauty's and Anderson's bridge	4
53.01	Complete set	
54	Capacitance circuit	2
54.01	Should measure capacitance upto250 pF	
55	Thermal Relaxation of a light bulb	2
55.01	Complete experimental set-up	
56	Lock-in amplifier	2
56.01	Upto 10 kHz; should measure ac voltages from 1 micro-volt to 250 micro-volt	
57	Power amplifier	4
57.01	From 30 – 30 kHz and upto 10W in a matched load	
58	Tubular furnace	2
58.01	1 inch diameter and can go upto 400^{0}C	
59	Insert for temperature coefficient of resistance of Copper and band-gap of semiconductor	2
59.01	Complete set	
60	Multi-meter	40
60.01	Digital multi-meter (AC and DC): Voltmeter, ammeter, ohmmeter	
61	To study the Compton effect using scintillator	1
61.01	Complete set up for the experiment	
62	Determination of resistivity of semiconductor using Four Probe method	1
62.01	Make: SES, Model: DFP - 02 or Make: Indosaw, Model: SK012 or any other better quality (complete set). With three extra suitable samples.	
63	Febri-Perot Interferrometer	1
63.01	Make: Reputed Brand (Complete set)	
64	Solid state photometer	1
64.01	Serial output for pc connection, data acquisition program, should include telescope	

	coupler.	
65	Electron Spin Resonance Spectrometer	1
65.01	Make: SES, Model: ESR-105 or any other better quality (complete set)	
66	Detector for He-Ne laser	2
66.01	2 mW power [Make: Reputed branded]. Accessories: Suitable power meter	
67	Breadboard	100
67.01	Make: Reputed Brand. Specification: Size: 180 cm (L) x 120 cm (W), Top skin: 5 mm thick nonmagnetic SS - 304 grade with 0.25 mm thick aluminium honeycomb core, Bottom skin: 5 mm thick non-magnetic SS - 304 grade, Core cell size: 6 sq. cm (approx.) with Nylon cups under each tapped hole, Flateness of the top surface: +/- 0.1 mm over 30 cm x 30 cm area (non-cumulative error), Grid size: 25 mm (M6 tapped holes), Accessories: All the required accessories.	
68	Single channel analyzer based Gamma ray spectroscopy system	1
68.01	Manufacturer: Para Electronics, Mumbai or any other better quality (complete set). Accessories: Suitable radioactive sources and other related aceessories including branded computer (with pre-loaded suitable software) to be supplied.	
69	Optical Spectrum Analyzer	1
69.01	Make: Reputed Brand Wavelength range 600 to 1700 nm (must be suitable for single-mode as well as multimode transmissions). Higher wavelength accuracy and dynamic range. Wavelength resolution settings from 20 pm to 2 nm; Level Sensitivity settings +20 to -90 dBm; Measurement power range up to 110 dB; High close-in dynamic range 78 dB typ with sharp spectral characteristics; Fast measurement only 0.2 sec for 100 nm span; Double Speed mode 2 dB penalty on the standard sensitivity value; Wavelength accuracy ± 0.01 nm; Wavelength Range Performance: 1520 to 1580 nm: ±0.01 nm; 1580 to 1620 nm; ±0.02 nm; 1450 to 1520 nm: ±0.04 nm. Full range ±0.1 nm; Full wavelength range ± 0.1 nm ± 0.1 nm; Straylight suppression ratio 80 dB typ; Facilities to be offered: Real-time remote control, Analysis Functions for popular applications required. – WDM (OSNR) analysis – Optical Fiber Amplifier analysis – DFB-LD analysis – FP-LD (VCSEL) analysis – LED analysis – Spectral Width analysis – Notch Width analysis – SMSR analysis – Polarization Mode Dispersion – Optical Power analysis – Optical Filter analysis (PK, BTM, WDM-PK, WDM-BTM). Data Logging function, Marker requires such as WDM analysis (OSNR, optical signal/noise ratio), distributed feedback laser diode (DFB-LD) analysis, etc.	
70	Picoammeter/Voltage source	1
70.01	Make: Reputed Brand, Accessories: Suitable cables and other necessary accessories to be supplied.	
71	HIGH RESOLUTION XRD SYSTEM FOR ADVANCE MATERIAL CHARACTERISATION	1
71.01	The XRD must contain horizontal sample mount with theta-theta (θ-θ) goniometer	

with high resolution scanning mode. The entire system must be provided with the following specification:

X-RAY GENERATOR:

Maximum Rated Output : 3KW continuous rated maximum output power.
Rated Voltage : 20-50 KV (in steps of 1 KV) or more.
Rated Current : 2-50 mA (in steps of 1 mA) or more.
Stability:± 0.01% per 10% main variations (for voltage and current, within ± 10% input power variations).
X-Ray Tube Shield: Electro Magnetic Shutter interlocked with radiation enclosure.
Safety Device: Abnormal cooling water, flow rate, water Pressure, Temperature detection, abnormal XG load (over load, line current, abnormal low and high voltage, emergency stop switch, leak breaker), shutter malfunction detection.
X-Ray Tube: Cu Target material, long line fine focus with Ni K_β Filter.

GONIOMETER:

The θ-θ Goniometer must hold the sample in a Horizontal and Stationary position. The XRD system must be equipped with a Parabolic Multilayered Mirror and should have the provision for changing from Bragg & Brentano(BB) focusing optics to Parallel Beam (PB) optics and Vis-A-Vis with auto alignment facility.
The Goniometer should be capable of using small angle scattering measurement, thin film measurement with proper slit and accessories if required which should be offered in option.

(1) Geometry: Vertical θ/θ (keeps sample horizontal and stationary)
(2) Scanning mode: θ_D/θ_S independent or coupled
(3) Minimum step width: (θ_D, θ_S) 0.0001 °
(4) Scanning step: θ_D/θ_S coupled 0.0002 – 10 ° step (2θ)
θ_D/θ_S independent 0.0001 – 5 ° step
(5) Range: θ_D/θ_S coupled -3 – +160 ° (2θ) with Capability to work in transmission mode geometry.
(6) Goniometer radius: 300 mm or better
(7) Z-Axis : -10 to + 2mm. 0.0005mm step (Motorized)

Illumination: Both Symmetric and Asymmetric illumination are to be provided.

OPTICAL SYSTEM:

Slit Exchange:
Type: Automatic Computer Controlled & Programmable Variable Slits (both incident and receiving side)
Slit Width:
Incident Slit (IS) : 0.05-7.00 mm,0.01 mm Step or better
Receiving Slit (RS2): 0.05 – 20.00 mm, 0.01 mm Step or better
Height Limiting Slit: Necessary Height Limiting Slits are to be included..

Automatic Optical System Alignment:
Complete automatic alignment without manual intervention is needed. Automatic Alignment should be done by the software for the alignment of source height, source angle, mirror optic, crystal optic, slit height, sample surface and detector angle. Automatic Computer Control adjustment for detector high voltage and pulse height analyzer.

Rotary Attenuator:
1) Type: Computer Controlled, Programmable Automatic Rotary attenuator

2) Configuration: 1/70, 1/1000, 1/14000 and Open with automatic selection depending on the X-Ray intensity.

Flexible Soller Slit System:
Type: Incident & receiving Soller Slits should be provided.

High speed Semi Conductor 1-D Detector:
The High Speed Detector should be maintenance free and must work without using any cooling agent with minimum scan speed of 100°/min, no of channels/ semiconductor stips 250 or better, 99% efficiency for Cu Kα or better and dynamic range 1 x 10^6cps/line(minimum). The special resolution (pitch) of the Detector chip must be 75µm or better. The High Speed Detector should work either in 0-D mode or in 1-D mode and the same detector should also work in normal mode or in fluorescence reduction mode (without using diffracted beam monochromator).

High Resolution Thin film attachment:

Automatic sample stage which should be included with auto alignment for auto Z- axis alignment for height adjustment and ϕ axis for free rotation of sample with automatic alignment procedure for measurement of thickness, density and roughness (XRR) of thin film sample using reflectivity software.

Standard Software:
The system software engine must be on intelligence-based data collection platform which must select automatically and check right hardware configuration using hardware sensors to provide fully automatic optical & sample alignment, slit and scan condition setting and measurement.
The software should also contain the following features.
Peak search, integrated intensity calculation, Multiple recording of raw data files,, Measurement condition display and editing, Data conversion to ASCII and general TEXT format with powder diffraction pattern analysis based on ICDD database PDF-2.

***Qualitative analysis software*;**

- Hybrid search / match algorithms which combines the features of peak based and profile based phase identification techniques. It offers improves qualitative analysis performance which makes identification of crystalline phase with preferred orientation or a complex lattice deformation.
- Smoothing, Background reduction, Kα2 removal, peak search, customization ICDD access.
- Search Match for PDF-2.
- Rietvelt method, WPF (Whole Pattern Fitting) method with user friendly graphical interface for performing operations from Crystal Structure parameter from database to setting analysis condition and displaying crystal structures and quantitative analysis.

RADIATION ENCLOSURE:
Open & Close Door System (with a Pb-contained Acrylic Resin Windows)
Lead equivalent: 0.5mm Pb equivalent.
Fail Safe Function: With a CPU Controlled function.
Warning Light: Installed independently on the top of the Radiation Enclosure.

OPTIONAL ACCESORRIES

	(a) Small Angle Scattering X-Ray (SAXS)attachment: SAXS Unit for Particle and Pore Size Distribution of both solid & liquid samples with measuring range from 0.1 to 5° must include SAXS unit with Vacuum Path and suitable nano material software for particle size ranging from 1nm to 100nm or more. Also, a Certified Standard sample has to be provided for calibration purpose for SAXS measurement. Suitable software for pore size and distribution analysis and long periodicity analysis should be included. Capillary spinner with capillary tube with different dimension should be offered in option. **(b) High Temperature Attachment** : Suitable High Temperature Attachment should be offered to do experiment at sub-ambient condition. The High Temperature Attachment should be capable of attaining temperature from ambient to 1400°C or higher. The attachment must include automatic Programming Temperature controller and necessary vacuum pump & other hardwares. Software: PC based software packages to control all instrument parameters and should provide best algorithms for solving analytical tasks. Should enable both Qualitative and Semi quantitative analysis. Easy simulation and automatic refinement / smoothening of measured data. Integrated Intensity calculation, background calculation and subtraction, profile smoothing, Peak Search, LPA calibration, etc. Application Software should be offered optionally for Rietveld analysis, Crystallinity analysis, Lattice constant refinement and crystal size & lattice strain analysis. The ICDD database (licensed version) with single user license should be offered separately. Computer & Printer: Suitable computer (with latest configuration and pre-loaded software) and laser printer must be offered. Water Chiller: Suitable closed circuit chilling water system if required should be offered. If external chiller offered the same should be capable to work in ambient temperature of 40^0 C. Servo Controlled Voltage Stabiliser: Single Phase with auto step down Transformer with Voltage Stabiliser should be offered. Spares: Commitments to supply spares for at least 10 years to be ensured. Separate Spare kits for the Diffractometer should be quoted as optional items. Accessories: All the necessary accessories to be offered. AFTER SALES SERVICE: 1. Product support for period of minimum five years after warranty period to be ensured by vendor/supplier. 2. Relevant software/hardware information in case of updating of the model of the supplied system should be provided. 3. Minimum one year warranty should be offered. TRAINING: The supplier should provide the training on the site of installation. Vendor should take all necessary responsibility to quote for configuration to suit all the above applications.	
72	Scanning Tunneling Microscope (STM)	1
72.01	Make: Imported reputed brand. Specification:	

	STM scan Head: 1um; Max scan range: 1 um; Max Z-range: 200 nm; Drive resolution Z: 3 pm; Drive resolution XY: 15 p; Current set point: 0.1 – 100 nA in 25 pA steps; Image mode: Constant current (Topography), Constant height (current); Spectroscopy modes: Current-voltage, Current-distance; Tip voltage: ±10 V in 5 mV steps Sample approach: Stick-slip motor Sample size: Max 10 mm diameter Power supply: 240 V AC, 50 Hz; Accessories: n-type single crystalline Si(100) or Si(111) single side polished wafer with resistivity of 1-10 m Ohm-cm of 4 inch diameter - 10 Nos, Au thin film, Au (111) single crystal, HOPG, MoS2, etc samples, power controller, STM wires, sample supports, nanogrid calibration grating, Silver paint to attach samples to supports, suitable branded computer and laser printer, etc. Warranty: Minimum of one year warranty should be offered.	
73	Distilling apparatus (Manesty type) for production of Pyrogen free distilled water	1
73.01	Make: Reputed brand. Specification: Output capacity: 1.5 Liter per hour or above; Construction material: Stainless steel; Power supply: 230 V/AC; Accessories: Wall mounting clamp, Suitable plastic pipe of 10 mts, 10 No. of extra heating coils, plastic water reservoir 10 L size 2 Nos, and other accessories as required.	
74	Digital pH meter with electrode	2
74.01	Make: Imported reputed brand. Specification: pH Range: 0 to 14 pH. pH Accuracy: ± 0.01 pH or less. mV range: -1999 to 1999 mV. Temperature Range: 0 to 100 deg C with ± 1 deg C accuracy. Dimension: 210 mm x 205 mm x 65 mm. Acessories: Suitable temperature probe, stand and good quality KCl and HCl (one bottle each) to be supplied.	
75	Hot plate with Magnetic stirrer	2
75.01	Make: Reputed brand Specification: Stirring volume: up to 1 L or higher Stirring speed range: up to 1000 RPM. Plate material: SS. Temperature range: R.T. to 280 deg C or higher. Accessories: All necessary accessories.	
76	2-3 metre Radio Telescope	1
76.01	Anteena Dia: 2-3m, Prime Focus, Receiver, Feed, LNB, Equatoria GOTO mount, Control Handpad and Software	
77	Digital Oscilloscope-I	1
77.01	Make: Reputed brand. Specification: 2 channels / Dual trace: Zoom Function; 50 MHz bandwidth: Automated, extended data logging feature; Up to 1 GS/s sample rate on all channel: Autoset and auto-ranging functions; 2.5 k point record length on all channel Built-in context-sensitive help; Advance triggers including pulse and line-selectable video triggers Multiple-language user interface;	

	34 automated measurements: 7 inch WVGA (800X480) Active TFT Color Display; Dual window FFT, simultaneously monitors both the time and frequency domains: USB 2.0 host port on the front panel for quick and easy data storage; Built-in waveform limit and trend plot testing :USB 2.0 device port on rear panel for easy connection to a PC; Dual channel frequency counter Accessories: 50MHz passive probes, Power Cord, Open Choice Desktop Software, and other related accessories.	
78	Magnetic hysteresis loop tracer.	2
78.01	Make: Reputed Brand , complete set with three extra sample	
79	CW Nuclear Magnetic Resonance	1
79.01	Make: Reputed Brand ,(complete set) with one extra sample	
80	Atomic Force Microscope	1
80.01	Make: Imported reputed brand X & Y Range: 90 µm or higher X & Y Sensors: <0.5 nm noise, <0.5% nonlinearity (max deviation full travel) Z Range: >15 µm (Extended range Z option >40 µm) Cantilever Deflection Sensing: Optical lever in an inverted configuration (incident beam off-vertical) to dramatically reduce interference from light reflected by the sample. Light Source: Low-coherence infrared (860 nm) superluminescent diode (SLD), FDA/IEC Class 1M (non-hazardous) DC Detector Noise : < 15 pm DC Height Noise : < 50 pm AC Height Noise : < 50 pm Sample Stage Accommodates samples up to 80 mm diameter and up to 10 mm thick. Micrometer driven stage allows precise tip-sample alignment Top-View Optics Probe, IR SLD spot, and sample can be viewed through top-down brightfield optics with two selectable fields of view, 720 µm and 240 µm, through a 10X objective. Scanner Drive Three high-resolution 24-bit DACs are used for XY scanning and Z motion, ensuring that bit noise (< 6 pm XY and < 1 pm Z) never limits scan resolution. Ultra-low-noise amplifiers result in < 70 uV Adev noise on the high voltage (-10 to 150 V) piezo drive signals in a 1 Hz to 10 kHz bandwidth. Closed-loop Scanner Feedback : Integrated low-noise position sensors in all three axes are immediately digitized and input to three independent, all-digital feedback loops to provide seamless closed-loop operation. This eliminates and corrects position errors in the scanning system due to piezo hysteresis, creep, and non-linearity, and substantially reduces thermal drift. Deflection Signal : Immediately sampled with 16-bit ADC operating at 5 MHz with seven gains and a 16-bit offset. AC Mode Support : Two Direct Digital Synthesizers (DDS) are summed to generate the AC drive signal on a 16-bit, 10 MHz DAC at frequencies from DC to 2.0 MHz. Fully digital dual lock-in provides quadrature outputs at bandwidths up to 9 kHz. Digital Q-control can typically enhance or	

	suppress cantilever Q by up to 5X. Data Acquisition: Limited only by the memory on the PC (i.e., 10 million point force curves, > 8k x 8k pixel images Computer Interface: Suitable USB interface to a high-performance, dual-monitor, Windows 7 (or 8 or 10) 64-bit PC. Computer; Suitable branded computer with laser printer Software: Suitable software (preloaded) for data acquisition and analysis Accessories: Suitable vibration isolation table and all other necessary accessories to be offered to run the machine smoothly. Also Au thin film, Au (111) single crystal, HOPG, MoS_2, etc samples, power controller, cantilever tip 20 Nos to be supplied with the instrument. Spares : Commitments to supply spares for at least 10 years to be ensured. Warranty: Minimum two years warranty should be offered. Product support for period of minimum five years after warranty period to be ensured by vendor/supplier.	
81	Field Emission Scanning Electron Microscope	1
81.01	Make : Imported reputed brand Electron Source : Schottky Thermal Field Emitter Resolution @ 15 kV : 1.2 nm or better Resolution @ 1 kV : 2.2 nm or better Backscatter Detector (BSD): HD BSD Maximum Scan Speed : 100 ns/pixel or higher Accelerating Voltage: 0.02 – 30 kV Magnification : 10× – 1,000,000× or better Probe Current: 4 pA – 20 nA and 40 nA Image Framestore :3 k × 2 k pixels Ports : 10 or more EDS Ports : 2 (1 dedicated port) High Vacuum :Yes Variable Pressure :2 – 133 Pa Stage Type : 5 axis compucentricstage Stage travel X : 125 mm Stage travel Y : 125 mm Stage travel Z : 50 mm Stage travel T : -10 to +90 degrees Stage travel R : 360° Continuous Computer : Suitable branded computer with laser printer Software : Suitable software for data acquisition and analysis Accessories : All other related accessories (including suitable vibration isolation table) to be offered. Also necessary equipments for sample preparation prior to SEM characterization should be provided. Spares : Commitments to supply spares for at least 10 years to be ensured. Separate Spare kits for this laser should be quoted as optional items. Warranty : Minimum one year warranty should be offered. Product support for period of minimum five years after warranty period to be ensured by vendor/supplier.	
82	Picosecond Fluorescence Life Time	1

	Spectrometer	
82.01	Make : Imported Reputed brand Spectromete : Optical configuration : 90 deg between excitation and emission beam path Mode of operation : Time correlation single photon counting (TCSPC technique) Life time range : 50 pico second to 50 micro second or larger Mechanical spectral range : 200 nm – 900 nm or larger Spectral band pass : 0 nm – 60 nm (computer controlled) Temporal Dispersion : Very close to Zero or better Laser beam attenuation: 4 order of magnitude, continuously adjustable (computer controlled) Detector: Type : Hamamatsu with amplifier, interlock and overload protection in fan assisted TE cooled housing Detector response width : 250 ps Dark count rate: 150 cps at 0 deg C Lasers : EPLEDs' wavelength : 270 nm, 330 nm, 380 nm, etc picoseconds pulsed type Accessories Laser Input coupling : Suitable Laser input coupler to be offered Polarizer : Suitable Excitation and Emission polarizer (computer controlled) with spectral range of 220 nm – 900 nm or larger to be offered Solid Sample holder : Single position front face sample holder with two additional inserts suitable for measurements of powders and film/slide to be offered. Quartz Cuvette with PTFE covers : 5 Nos. of Fluorescence cell (for 170 nm – 2700 nm range) for liquid sample with 10 mm pass length with nominal volume of 3.5 ml to be offered Computer : Suitable branded computer with laser printer Software: Suitable software for data acquisition and analysis. Also all other related accessories to be offered Spares : Commitments to supply spares for at least 10 years to be ensured. Separate Spare kits for this laser should be quoted as optional items. Warranty: Minimum one year warranty should be offered. Product support for period of minimum five years after warranty period to be ensured by vendor/supplier.	
83	Nanosecond NdYAG pulsed laser	1
83.01	Make : Imported reputed brand Repetition rate : 10 Hz Energy per pulse : 420 mJ @ 1064 nm and 210 mJ @ 532 nm Pulse Width :5-7 ns @1064 Energy stability : ± 2% @ 1064 nm Accessories : All the necessary accessories including suitable power supplies for the laser, water chiller including pump, branded computer (with preloaded software) if required. Spares : Commitments to supply spares for at least 10 years to be ensured. Separate Spare kits for this laser should be quoted as optional items. Warranty : Minimum one year warranty should be offered. Product support for period of minimum five years after warranty period to be ensured by vendor/supplier.	

84	Z-scan system	1
84.01	The Z-scane system must be suitable for above mentioned NdYAG laser for carrying out optical non- linearity measurements for solid, powder, and liquid samples. Also this system should be complete in all respects (withsuitabledetectors, lenses, beamsplitter, steppermotorcontrolledopticalbench, latestbranded computer (with preloaded software), laser jet branded printer, 5 pairs of cuvette, solid sample holder for film and powder, etc).	
85	Muffle furnace with Temperature Controller	1
85.01	Make: Reputed brand Furnace : Temperature range up to 1200 deg C Heating rate : 0 to 10 deg /min (variable type) Temperature resolution :1 deg C Temperature controller : Eurotherm EU 100 Stability : ≤1% of range Heating element : SiC Power supply : Thyrester controlled Type of front loading size : 5 inch x 5 inch x 10 inch Overload protection : 100% Accessories: Alumina boat: Five (standard) Nos. Cup shaped Alumina Crucible : 50 mm size - 2 Nos and 100 mm size - 2 Nos Gas cylinder: Two in Nos. filled with Ar/N_2 gas (standard large) including two suitable pressure guages and pipes. Others: Inaddition, furnacewillhaveagasflowsystemofdiameterof10mmwith inletcontrolledbyasolenoidataparticulartemperature, andanautomated timerconnectedtotimeandtemperature.Alsoothernecessaryaccessories to be provided.	
86	Sputter Coating Unit	1
86.01	Make : Reputed brand Work chamber size : 15 cm inside diameter and 12.7 cm high (made of borosilicate glass with integral implosion guard) or larger Specimen stage : Rotation with speed of 8 - 20 rpm or higher Vacuum system : Internally mounted Turbo pump (pumping speed=70 L /s or higher, air cooled) with Controller and two-stage oil mist filtered Rotary pump (pumping speed=50 L/m or higher) with vacuum hose, coupling kit. Vacuum measurement : Suitable guages for full vacuum range Typical vacuum : better than $5x10^{-5}$ mbar Sputtering : 0 - 150 mA to a pre-determined thickness User interface : Full graphical interface with touch screen buttons Accessories : Suitablemetalevaporationandapertureinsertincludingtheabilitytoevaporateupwards with Mo boats 10 Nos and Tungsten filaments 10 Nos., one additional sputter insert, 5 cmdiameterspecimenstagewithadjustabletiltupto90degrees,Filmthicknessmonitor attachment(includingoscillator,feedthrough,quartzcrystalholderandquartzcrystals), TwocylindersofArsputteringprocessgas(99.999%pure),FewmetalssuchasAu,Ag, Al, Cr, Pt, Ir for film preparation and other necessaryaccessories.	
87	LCR Meter	1

87.01		Make		Imported reputed brand	
		Measurement Parameters		$\|Z\|$, $\|Y\|$, θ, R_p, R_S (ESR), G, X,B, C_p, C_S, L_p, L_S, D (tan δ), Q or more	
		Measurement ranges	$\|Z\|$, R, X	10.00 mΩ to 200.00 MΩ or higher	
			θ	-180^{υ} to $+180^{\upsilon}$	
			C	0.3200 pF to 370 mF or higher	
			L	16 nH to 750 kH or higher	
			D	0.00001 to 9.99999 or higher	
			Q	0.01 to 999.99 or higher	
			$\|Y\|$, G, B	5.0000 nS to 99.999 S or higher	
		Basic Accuracy		Z: ± 0.08% rdg. θ: $\pm 0.05^{\upsilon}$	
		Measurement Frequency		42 Kz to 5 MHz or larger	
		Measurement Signal Levels		10 mV to 5 V rms / 10 μA to 100 mA rms	
		Output Impedance		50 Ω	
		Measurement time		FAST: 5 mS, NORMAL: 21 ms, SLOW ½: 72 ms/ 140 ms	
		Settings in memory		Minimum 30 sets	
		Comparator functions		HI/IN/LO settings for two measurement parameters: percentage, Δ% or absolute value settings	
		External interface		RS-232C	
		Software		Suitable software to be offered	
		Accessories		All the necessary accessories including branded latest PC (with preloaded software) to be provided.	
88	MOKE Hysteresis Loop tracer				1
88.01	1. PEM Head Assembly		Optical Material: Fused Silica		
			Operating Frequency: 50 kHz		
				Retardation range: 170nm - 1μm (Half-wave)	
				Useful Aperture: 16 mm	
				Acceptance Angle: ± 20 deg	
				Sensitivity: Better than 10^{-6}	
				Suitable for Moke measurements	
	1a) Magnetic Field Compatible Head			For use in Magnetic field up to 4T	
	1b) Antireflective Coating			632.8 nm	

	1c) Microprocessor-Based Control	Control of peak retardation		
		Automatic adjustment of modulator drive level should based on user-supplied retardation and wavelength values		
		Memory protection of controller setup parameters (even when unit is turned off)		
	Digital Front Panel Settings & Control	For user convenience, LCD display should show which parameters and modes are in use.		
		Display of retardation in user-selectable phase units (waves, radians, degrees)		
		Selectable display of wavelength in nm, μm, or cm^{-1}		
		Precise digital setting of retardation		
		Incremental increase of wavelength and retardation values		
	Computer Operation	RS-232 serial interface to computer with selectable baud rate		
		PEM100 software should provide for complete computer control including macro capabilities		
		Computer monitor of controller status		
	2. Photodiode Detector/Preamplifier			
		Active area: 16 mm^2		
		Operating Temperature Range: 0°C to 60°C		
		Type: Silicon Photoconductive		
		Active Area: 16 mm^2		
		Input power bipolar 12V to 18 V		
		Frequency Bandwidth, DC to 1 MHz		
		Spectral Response, 350 to 1100 nm		
	3. He-Ne Laser with power supply			
		Minimum Output power,TEM 00 : 2 (mW)		
		Beam diameter,1/e 2 : 0.63 mm		
		Beam divergence: 1.30 (mrad)		
		Polarization: 500:1		
		Longitudinal Mode Spacing, Nominal :730(MHz)		
		RMS Noise, 30Hz-10MHz: 0.1%		
		Wavelength: 632.8nm Spatial mode:TEM 00		

			Mode quality, M 2 : >95%	
			Pointing Stability(mrad/°C): from cold start,25°: <0.1	
			Pointing Stability after Warm-Up (mrad/°C): After 158min: <0.02	
			CE certified	
		4. Calcite prism Polarizer & Analyzer	Glan- Taylor type	
			Extinction ratio of 100,000:1	
			Clear Aperture: 5 X 5 mm 2	
			Coating : 350- 700nm	
			With Precision polarizer mounts.	
		5. Signal Recovery		
		Signal Channel	Modes: Single-ended	
			Impedance: 1 MΩ / 10 pF	
			Frequency Response: 40 Hz to 250 kHz	
			Maximum Input: 2.5 Vpp	
			Full-scale Sensitivity: 4 μV	
			Gain: 0, 3, 6, 9, 12, 15 db (selectable)	
			Gain Accuracy: +/- 1% for ≥ 1 mV +/- 5% for < 1 mV	
			Phase Accuracy: +/- 1° for ≥ 1 mV	
			DC Accuracy: +/- 2 mV max	
			CMRR: > 60 dB	
		Signal Channel Filters	High-Pass Filter: (- 3 dB) 40 Hz	
			Low-Pass Filter: (- 3 dB) 250 kHz	
			Frequency Accuracy: +/- 5%	
		Reference Channel	Frequency Range; 20 kHz - 220 kHz	
			Frequency Accuracy: +/- 0.1% max	
			Reference Input; TTL or CMOS	
			Input Impedance; 10 MΩ, 50 pF	
			Phase Resolution: 0.01%	
			Acquisition Time 5 ms	
		6. Accessories	Suitable branded computer (with preloaded software) and laser printer to be provided. Also, other necessary accessories to be provided. The system should be in operation for both **transverse** and **longitudinal** modes.	
89	Electromagnet			1

89.01	Magnetic field strength: up to 4 Tesla Accessories: All the necessary accessories to be provided for installation in the MOKE hysteresis loop tracer mention above.	
90	UV Spectrometer	1
90.01	Branded Company Manufacture	
91	Zero background sample holder for XRD Experiments	1
91.01	Make: Imported reputed brand, To be suitable for PROTO AXRD set up.	
92	To study Rutherford's scattering experiment	1
92.01	Complete set up for the experiment	
93	Basic items for Electronic Lab Experiments	
93.01	List is Attached in **Annexure 1**	
94	Basic items for General Lab Experiments	
94.01	List is attached in **Annexure 2**	

Annexure 1

List of items for General Electronic Lab Experiments

1. IC for Electronics Lab

Sl no.	Item	Quantity
i)	LED	26
ii)	LDR	05
iii)	Relay(12V)	04
iv)	DIODE(IN 4007)	50
v)	DIODE(IN 4148)	50
vi)	IC 7404	20
vii)	IC 7408	15
viii)	IC 7409	20
ix)	IC 7432	20
x)	IC 7447	20
xi)	IC 7476	20
xii)	IC 7400	20
xiii)	IC 8085	10
xiv)	IC 555	20
xv)	IC 741	50
xvi)	IC 7402	20
xvii)	TL 082	10
xvii)	Transistor(BC 547)	200
xviii)	Transistor (BC 548)	100
xix)	Transistor (BC 107)	100
xx)	IC 723	50

2. Capacitor & Resistances of different values:

Sl no.	Item	Quantity
i)	Capacitor -0.1 µf	100
ii)	Capacitor -0.001 µf	100
iii)	Capacitor -0.01 µf	100
iv)	Resistance Pot (1MΩ)	20
v)	Resistance Pot(47K)	20
vi)	Resistance Pot(10K)	15
vii)	Resistance Pot(100K)	15
viii)	Resistance Pot(1K)	15
ix)	Resistance Box (Key type)	5
x)	Capacitance Box (Dial type)	2
xi)	Inductance Box (Dial type)	2
xii)	Digital ammeter (0-2mA, 0-20mA))	6
xiii)	Digital Voltmeter (0-5V)	3
xiv)	Power supply (0 to +100mV, 0 to +15 mV, -15 to +15 V)	6

Annexure 2

List of items for General Lab Experiments

A. GENERAL ITEMS

Sl No	Name of the Item	Specifications (with Make & Model)	Quantity
1	Franck-Hertz Tube/Valve	for SES, FH-3001 set up	1
2	Mirrors , Glass Plates	Compatible for Precision Interferometer of Lambda Scientific – LEOI -22	2 sets
3	Mica sheets of different thickness	for Michelson Interferometer experiment	2
4	Laser pointer	Standard quality	2
5	Fibre optic cable	Suitable for fibre optic kit experiments, 1 mts length	5
6	BNC Cord	Standard.	50
7	Pot	1 KΩ, 10 KΩ, 100 KΩ, 1 MΩ, 10 MΩ	20 each
8	Crocodile clip	Good quality (red and black colors)	50 each
9	Connecting cord	One side probe	50
10	Optical fibre	Plastic	20 Mts
11	Connecting copper wire	With plastic insulation, 0.75 mm, Make: Polycabe/Equivalent	1 coil
12	Connecting copper wire	With plastic insulation, 1.5 mm, Make: Polycabe/Equivalent	1 coil
13	Connecting copper wire	With plastic insulation, 2.5 mm, Make: Polycabe/Equivalent	1 coil
14	Connecting copper wire	Single wire with 22 gauge and plastic insulation (three different colors)	1 coil each
15	Switch	6 A, 240 V, Make: Anchor	2 Boxes
16	Socket	5 Pins, 6 A, 240 V, Make: Anchor	2 Boxes
17	Top	3 Pins, 6 A, 240 V, Make: Anchor	1 Box
18	Electric Board	Suitable for 4 Switch-Socket sets, Make: Reputed brand	5
19	TEM grids (carbon coated copper grids)	300 mesh type, 3 mm diameter	50 Pcs
20	Crystallographic Models	SC, BCC, FCC, Hexagonal closed pack, Diamond, ZnS,CsCl, NaCl Structures, model with surface dangling bonds of Si (all crystal models should be of very good quality)	2 Sets
21	Single mode optical fibre with SC/SC connector	100 m, 200 m, 1 Km, 2 Km, 5 Km, 10 Km	12 Pcs (2 each)

22	Single mode optical fibre with FC/APC connector	100 m, 200 m, 1 Km, 2 Km, 5 Km, 10 Km	12 Pcs (2 each)
23	Lycopodium powder	100gm	1 box
24	Aluminium foil	Roll type and standard size	1 roll
25.	Wooden Extension cord	Make: 5 pin sochet, switch-3, fuse-1, Indicator-1 and 5 meter of wire per board	5
26	Torch Light	# 3AA batteries	1
27	Walate	For 50 CDs	1
28	Induction Boxes --5	Single/double type , 1 to 100 mH	5
29	Tissue Paper	For cleaning mirror and glass items	10
30	Hydrogen Discharge tube With power supply	Set up with stand	5
31	Helium Discharge Tube With power supply	Set up with stand	5
32	Lamp housing Na Vapor lamp		2
33	Plane transmission grating	100 lines per mm	2
34	Crossed transmission grating	100 diffracting elements per mm	2
35	Si watt wafer	Single crystal with resistivity 1-10 ohm.cm , dia 3cm, thickness o.5mm	2
36	Ge watt wafer	Single crystal with resistivity 1-10 ohm.cm , dia 3cm, thickness o.5mm	1
37	Dimond glass cutter	Pen shaped, good quality	2
38	Hg thermometer	-10 to 200 deg C	5
39	Spirit level	Good quality	5
40	Magnifying glass with double lens	Good quality	2
41	Meter scale	Wooden material	3
42	Screw Guage	v.c.=0.01cm, made of stainless steel	5
43	Vernier Callipers	V.C.=0.001cm made off stainless steel	5
44	Eye pieces for Travelling microscope	10x	2
45	Eye pieces for Telescope of spectrometer		2
46	Atomic Model set	Make TARSONS, code :061000, junior set	1
47	Atomic Model set	Make TARSONS, code :062000, junior set	1
48	Crystal Model Set, Dimond	Make TARSONS, code :101000, junior set	2
49	Optical Spectrometer	Branded Company manufacture	4
50	Mercury arc Lamp	Standard One	2

B. GLASSWARE/PLASTICWARE

Sl No	Name of the item	Specifications	Quantity
1	Beaker	1L, Tall form, Borosil	3
2	Beaker	500 ml, Borosil	5
3	Beaker	250 ml, Borosil	5
4	Beaker	100 ml, Tall form, Borosil	5
5	Beaker	50 ml, Tall form, Borosil	5
6	Conical Flasks	250 ml, Borosil (Code: 4980021)	3
7	Conical Flasks	100 ml, Borosil (Code: 4980016)	3
8	Conical Flasks with screw cap	100 ml, Borosil (Code: 5021016)	5
9	Conical Flasks with screw cap	150 ml, Borosil (Code: 5021018)	5
10	Weighted ring	for conical flask of 100 ml capacity	3
11	Weighted ring	for conical flask of 200 ml capacity	3
12	Volumetric flux	100 ml, Borosil (Code: 5645016)	2
13	Volumetric flux	50 ml, Borosil (Code: 5645012)	2
14	Volumetric flux	25 ml, Borosil (Code: 5645009)	2
15	Volumetric flux	10 ml, Borosil	2
16	Cylinder	100 nm, Borosil (Code: 2975016)	5
17	Tray	Borosil (Code:3170042)	2
18	Pipette	10 ml, Borosil (Code: 7079P06)	2
19	Pipette	25 ml, for transferring chemicals, without gra	10
20	Bottle	25 ml, Borosil (Code: 1501009)	200
23	Bottle	50 ml, Borosil (Code: 1501012)	200
	Bottle	300 ml, Borosil (Code: 1250022)	10
24	Wash Bottle	500 ml, Borosil (Code: 1250022)	5
25	Centrifuge tube	1.5 ml, Tarsons (Code)	5 Pkts
26	Centrifuge tube	5 ml, Tarsons (Code)	2 Pkts
27	Micro Pestle	Tarsons (Code: 160020)	12 Nos
28	Petri dice	O.D.xHeight= 50x12, Borosil (Code: 3165065)	4
29	Petri dice	O.D.xHeight= 100x15, Borosil (Code: 3165077)	4
30	Burette	10 ml, Borosil (Code: 2118006)	4
31	Funnel	100 ml, Borosil (Code: 6140077)	5
32	Funnel holder	Single type, Tarsons (Code: 122100)	3
33	Microscope slide	(76x26x1= LxWxT), Borosil/Reputed brand	2 Pkts
34	Glass vials with screw cap	Tall form, 15 ml capacity, Reputed brand	30
35	Pipette Bulb	Up to 100 ml Tarsons (Code: 034000)	4
36	Glass dropper	To transfer liquid	10
37	Safeskin Purple Nitrile Gloves	Small, Tarsons (Code: 370020)	1 pkt
38	Vacuum Desiccators	300 mm, Tarsons (Code: 402040)	2
39	Ring clamp and Stand	Standard	300
40	Drying Rack	Tarsons (Code: 241100)	1
41	Measuring scoop	10 ml, Tarsons (Code: 922130)	5
42	Utility clamp	Metallic	250
43	Stand for utility clamp	Standard	400
44	Micro tip	2-200 micro L, Tarsons (Code: 521010)	2 pkts
46	Micro tip	200-1000 micro L, Tarsons (Code:	2 pkts

		521020)	
47	Centrifuge tube box	1.5 ml, Tarsons (Code: 202090)	8
	Centrifuge tube box	1.5 ml, Tarsons (Code: 500010)	2 pkts
48	Rac for Microtube	1.5 ml, Tarsons (Code: 240010)	2
49	Tygon Vacuum Tubing	Tarsons, suitable for Tarsons VacuumDesicca	3 mts
50	Glass cutter	Pen-shaped with diamond tip (reputed brand)	2
51	Twiser	Nonmagnetic made of stainless steel with straight fine tip, 5" length	5
52	Twiser	Nonmagnetic made of stainless steel with round tip, Standard	5
53	Teflon Twiser	Made of PTFE, 5" length	2
54	Stirring rod	Standard made of borosilicate glass	10
55	Test Tube stand	6 places, Tarsons (Code: 201060)	2
56	Clamp for test tube	Standard	5
57	Watch glass	Diameter= 150 mm, Borosil (Code: 9986072)	4
58	Mortar and Pastle	4" diameter made of porcelain	2
59	Flourescence Cell UV	Type: Non-flourescence quartz cuvette, Volume: 3.5 ml, Pathlength: 10 mm, Open 2/P.	4 pairs
60	Quartz cuvate with FEPT cover	Code: MCQ-4/104, Wavelength range: 190 to 2500 nm, Volume: 3.5 ml, Pathlength: 10 mm, Dimension: 45 mm x 12.5 mm x 12.5 mm. Matched pair certificate to be provided.	4 pairs
61	Storage Vials	10 ml, Tarsons (Code: 523150)	1pkt (500Pcs)
62	Filter paper	Whatman No 1, standard size	5 pkts
63	Hydrothermal Autoclave	Make: Imported reputed brand. 150 ml capacity stainless steel autoclave with teflon liner to withstand a temperature of about 250 deg C or higher, without electrical heating facility, gas flow facility, and pressure gauge [The autocave must be a very good quality]. Accessories: One extra suitable teflon liner.	1
64	Syringe filter with accessories	Standard. Make: Whatman	2
65	Muslin cloth for filtration	Reputed brand	2 mts

C. CHEMICALS

Sl No	Name of the Chemical	Specifications	Quantity
1	Acetone	Merck/Equivalent make	1 L
2	Ethanol	Merck/Equivalent make	5 L
3	Methanol	Merck/Equivalent make	2.5 L
4	Magnesium acetate tetrahydrate ($Cd(COOH)_2.4H_2O$)	Emsure, Merck	250 gm
5	Cadmium acetate dehydrate ($Cd(COOH)_2.2H_2O$)	Emsure, Merck	250 gm

6	Copper(II) acetate monohydrate (Cu $CH_3COO)_2.H_2O$	Emsure, Merck	250 gm
7	Polyvinylpyrrolidone (PVP)	average mol wt 40,000	100 gm
8	Sodium sulfide (Na_2S)	flakes Purified, Merck	500 gm
9	Manganese acetate tetrahydrate	Emsure, Merck	100 gm
10	Oxalic acid dihydrate	Emsure, Merck	250 gm
11	Silver nitrate	Emparata, Merck	25 gm x 4 Nos.
12	Nitric acid	Merck	2.5 L
13	Tetraethoxysilane (TEOS),	Reputed brand, GR Grade	25 ml
14	Glycidoxypropyltrimethoxysilane (GPTS)	Reputed brand, GR Grade	100 ml
15	Aminopropyltriethoxysilane (ATEOS)	Reputed brand, GR Grade	100 ml
16	Phenyltriethoxysilane (PhTEOS)	Merck make	100 ml
17	2-propanol	Emsure Merck	500 ml
18	Tetraethyleorthosilicate	Emsure Merck	250 gm
19	HCl	Emsure Merck	500 ml
20	KCl	Emsure Merck	250 ml
21	Diethanolamine	Emsure Merck	25 gm
22	ZnO powder	Emsure Merck	250 gm
23	ZnS powder	Emsure Merck	250 gm
24	Mercaptoacetic acid	Emsure Merck	500 ml
25	Polyallylamine hydrochloride	Emsure Merck	500 ml
26	Ammonium hydroxide	Reputed brand, GR Grade	25 ml
27	Conductive Silver Paste	SPI /Sigma Aldrich/ Equivalent	15 gm x2 bottles
28	Conductive Silver Paste Thinner	SPI /Sigma Aldrich/ Equivalent, Concentration ≥75% , Resistivity 1-3 x 10-5Ω-cm	30 cc x 2 bottles
29	Silica gel	Branded	1 kg

FOR ANY CLARIFICATION REGARDING TENDER PLEASE CONTACT WITH COOCH BEHAR PANCHANAN BARMA UNIVERSITY (TEL. NO: +91 3582 230218) E-MAIL ID – INFO@CBPBU.AC.IN

[TENDER FEE: RS. 2000/- (RUPEES TWO THOUSAND ONLY), NAME OF THE A/C: COOCH BEHAR PANCHANAN BARMA UNIVERSITY, SAVINGS ACCOUNT NUMBER: 32741316141, IFSC CODE: SBIN0000058]

1. **GeneralInstructions:**
   In the event of e-tendering, intending bidder may download the tender documents from the website: **http://wbtenders.gov.in**directly with the help of Digital Signature Certificate (DSC) or from the Cooch Behar PanchananBarma University website **www.cbpbu.ac.in.**

2. **Submission ofbids:**
   Both Technical Bid and Financial Bid are to be submitted concurrently duly digitally signed by the Company personnel who is in the pay roll of the Company (having Authorization from the Company management) in the website http:// wbtenders.gov.in. All papers must be submitted in English language.

3. **Time Schedules for thee-tender:**

   The Time Schedule for obtaining the Bid Documents, Pre-Bid meetings, the submission of bids and other documents etc. will be as per the list provided in Clause No. 10 given below.

4. **Eligibility for Quoting:**
   Manufacturers or Dealers/Distributors/Agents duly authorised by the manufacturers who are able to supply the assured quantities as per requirement & have requisite Annual Average Turnover, as per clause no. 5, are only eligible for quoting. Manufacturers not having the capability to supply the required quantity solely need not apply. Failure of submission of declaration of full supply will lead to cancellation of tender.

   Further, vendors who were declared black listed and/or insolvent by any Govt. Concern/any Institutions in the Country for particular item or items are not eligible to participate in the current tender for that item or items.

5. **Annual TurnoverRequirements:**
   Vender having average annual Turn Over for last three financial years is more than Rs.30 lakh in India or equivalent foreign currency in the respective foreign country for the year 2015-16, 2016- 17& 2017-18 are eligible to participate in the Tender.

6. **Submission ofTenders**

   6.1 General process ofsubmission

   Tenders are to be submitted online through the website stated in Clause 1. All the documents uploaded by the Tender Inviting Authority form an integral part of the contract. Tenderers are required to upload all the tender documents along with the other documents, as asked for in the tender, through the above website within the stipulated date and time as given in the Tender. Tenders are to be submitted in two folders at a time, one is Technical Bid and the other is Financial Bid. The tenderer shall carefully go through the documents and prepare the required documents and upload the scanned documents of originals in Portable Document Format (PDF) to the portal in the designated locations/folders of Technical Bid. He needs to fill up the BOQ in the designated cell and upload the same in designated location of Financial Bid. The documents uploaded are virus scanned and digitally signed using the Digital Signature Certificate (DSC). Tenderers should specially take note of all the addendum/corrigendum related to the tender till the bid submission ends. Tenderers should in general upload the latest documents as part of the tender, however, in case of failure in uploading such documents, it will be deemed that they (tenderers) have taken note of such latest documents including addendum/corrigendum, if published till the bid submissionends.

   6.2 TechnicalBid

   The Technical Bid should contain scanned copies and/or declarations in the following

standardised formats in two covers (folders):

I. Technical File (Statutory Cover)containing:

1. **Notice Inviting Tender (NIT)** – The NIT as published is to be downloaded and then uploaded the same digitally signed *(to be submitted in "NIT"folder).*
2. **Annexure** –
   a) BasicInformation (Vide Annexure I) *(to be submitted in "Annexure"folder)*
   b) Application for Tender - (Vide Annexure II) *(to be submitted in "Annexure"folder)*
   c) Authorization letter - (Vide Annexure III) *(to be submitted in "Annexure"folder)*
   d) Affidavit Proforma - (Vide Annexure IV) *(to be submitted in "Annexure"folder)*
3. Technical details of the Items Quoted (Bidders must submit Technical specification along with Catalogue of the item quoted in **"Technical Details"**Folders.
4. Bidder must submit Audited Balance Sheet and Profit and loss Account for last 3 (three) financial year namely 2014-15, 2015-16 & 2016-17 in **"Accounts"**folder.

Note: Tenders will be summarily rejected if any item in the statutory cover is missing.

II. My Document (Non-Statutory Cover) containing asfollows:

Sl.No.	Category	Sub-Category	Sub-Category Description
1	Certificates	Certificates	PAN Card of the Bidder
			VAT/ CST /GST Registration Certificate
			Exemption Certificate for paying EMD for the current financial year (if any)
2	Company Details	Company Details 1	Trade Licence/Enlistment Certificate
			Registration with Registrar of Companies
			Memorandum of Articles for Limited Companies.
3	Credential	Credential 1	a) Copy of the purchase order for supplying Similar nature of items at least for last 2 years in an Institute of HigherLearning b) Brief User List preferably for users in West Bengal in an Institute of HigherLearning
4	Financial Information	Payment Certificate 1	Income Tax Returns submitted for the Assessment year 2015-16
			Income Tax Returns submitted for the Assessment year 2016-17
			Income Tax Returns submitted for the Assessment year 2017-18
			VAT/CST/GST Returns (of the last quarter) for the year 2015-16

		Payment Certificate 2	VAT/CST/GST	Returns (of the last quarter) for the year 2016-17
			VAT/CST/GST	Returns (of the last quarter) for the year 2017-18

6.3 Financial Bid

The Financial Bid should contain the following document in one cover (folder):

Bill of Quantities (BOQ): The tenderer is to fill-up the designated cell as marked by the University in the BOQ under online mode through computer for preparing their quotation and thereafter tenderer will have to upload the same after digitally signed as submission of their quotation (Only downloaded copies of the BOQ as available in the web portal are to be uploaded without changing the name of the BOQ file after virus scanned and digitally signed by the tenderer)

7. The tenderers are not required to submit hard copies of Technical File (Statutory) or My documents (Non-Statutory). Submission of hard copy of Financial Bid is strictly prohibited and only be submitted through on line through NICportal.

8. Evaluation of thetenders

During the tender evaluation process, the "Technical Bid" will be opened first. Those Bidders who have qualified in respect of the essential & other requirements in "Technical Bid" will be identified and their financial bid will be opened. The financial bid of those Tenderer failing to meet the technical & other requirements laid down in the tender will not beopened and be rejected. The Tenderer offering the item found suitable and as per the tender specifications will only be selected. Final selection of the lowest bidder in respect of Financial Bid is subject to further verification. The Financial Bids of only those tenderers who have been considered as Technically Qualified will be opened. If found suitable in the context of above pre-qualification etc, the Tenderer quoting the lowest rate will be considered as successful.

9. TERMS & CONDITIONS REGARDING PURCHASE POLICY OF TENDERING AUTHORITY:

9.1 **BidInformation**:

a) **Partial Quotation within the same item serial number as mentioned in BOQ and also in this NIT will not be accepted and tender will be liable forcancellation.**

b) All duties, taxes and other levies payable by the contractor under the contract shall be includedinthetotalpricebutshouldbeindicatedseparatelyinthepricebid.

c) The rate quoted by the bidder shall be fixed for the duration of the contract and shall not be subject to adjustment on anyaccount.

d) Currency will be made either in INR or from any of the foreign currencies like USD, GBP, EURO andJPY.

9.2 **Evaluation of Quotation**: The Purchaser will evaluate and compare the quotations determined to be substantially responsive stage wise. Firstly, Technical Bid will be evaluated based on and thereafter Price Bid for technically qualified bidders will be evaluated for selection ofvender.

9.3 **Award of Contract**: **The contract shall be made item wise as per Item Serial number of the List of Items as shown in Clause 15.** The purchaser will award the contract to the bidder whose quotation has been determined to be substantially responsive both technically and commercially. Purchaser reserves the right to reject any or all the tender, wholly or partly, without assigning any reason thereof and shall not be bound to accept the lowestbid.

9.4 **Warranty**: The vendor shall be fully responsible for the comprehensive onsite warranty (3/3/3- part/labour/onsite) in all respect of the equipment's, accessories etc. including spares and services for a period of three years from the date of installation. Warranty will be effective from the date of joint installation Report.

9.5 **Adequate support service facility**: The bidder/manufacturer should have adequate service support centre in Kolkata/Siliguri/Cooch Behar for any emergency breakdown/fault offering facility within 48 hours and should be agreeable to provide AMC facility after the warranty period.

9.6 **Training Facility**: User training regarding the operation of the equipment's shall be arranged by the supplier/vendor at no extra cost.

9.7 **Manufacturer's Authorization**: Document in support of Manufacturer/Dealer and Service Provider has to be submitted along with the tender paper. If the bidder is not the manufacturer, proper manufacturer's authorization and warranty from manufacturer isrequired.

9.8 **Credentials**: Documents of previous experience of the job, at least 2 years, must be submitted along with thetender.

9.9 **DSIR Certification**: The Cooch Behar Panchanan Barma University will provide the necessary certificate at the time ofpurchase.

9.10 **Make & Model**: Bidder must mention Make and Model in the Information Sheet as given vide Annexure-I and must send the product details/catalogue/brochure in the "**Technical Details**"folder.

9.11 **Time Schedule**: The supply and installation work must be completed within 15 days from the date of receipt of the purchase order.

9.12 **Validity of offer**: A bidder should spell out in the tender that it shall remain valid for a minimum period of three months from the date of opening of the tender and during this period, the bidder shall not be entitled to revoke or cancel itsoffer.

9.13 **Place of delivery**: Department of Physics, Cooch Behar PanchananBarma University, Cooch Behar -736101.

9.14 **Payment Schedule**: 100% of the bill value will be paid after satisfactory installation of the equipments.

9.15 PerformanceSecurity: **Successful bidder should deposit Performance Security money equivalent to the 10% of the order value in the form of DD/Bank Guarantee immediately before issuing purchase order from the University. Such security will be refunded after completion of the warranty period in normal case without any accrued interest. University may forfeit the Security Money in the event of the followingcircumstances:**

i) Selected bidder withdraws the bid before expiry of its validity but after receipt of the Purchase Order.

ii) Selected bidder does not accept the order after issuing the same or fails to enter into a contract within validity period ofoffer.

iii) Selected bidder fails to supply the items within the scheduled time as specified in the Purchase Order

iv) If before expiry of the warranty period, the supplied items break down or do not function satisfactorily due to the cause related with the item itself or for its installation and not for any reason caused by the University Authority and the supplier denies taking the responsibility to make thesupplied items in order.

v) In case of any false submission /statement by the bidder.

vi) In case of any refusal to abide by terms and conditions or refusal to enter into a written agreement as per prefixed terms and conditions.

9.16 **Quantity Changeability**: Quantity as stated in the tender document may subject to change at the time of issuing purchase order due to the fund crunch or for other validreasons.

9.17 **Requisite Documents to be submitted:** Bidder must have adequate documents relating to Trade License and updated returns for Income Tax, VAT, GST Audited Statement of Accounts and other documents as sought for under Clause 6.2.II of thistender.

9.18 **Turnover Criterion**: Bidder must have average annual turnover of more than Rs.30 lakh in three financial year ending2016-17.

9.19 **Disposal of Disputes**: In case of any dispute, the University's decision will be treated as the final and conclusive. All legal actions are subject to Kolkata/ Cooch Behar jurisdictiononly.

9.20 **Conversion of FC Rate**: Generally, the West Bengal Government Portal is equipped enough for conversion of Foreign Currency (FC) rate into INR. In case of any problem arising out of the West Bengal Government Portal for e-tender regarding the conversion rate against foreign currencies quoted by the bidders in the BOQ, the conversion rate as existing in the official website of the Reserve Bank of India (RBI) as on the date of opening the Financial Bid will be considered for Financial Bid Evaluation.

Discretion of the University:

9.21 University may take decision about non-purchase of the said equipment even after selection of vendor due to its fund constraints.

9.22 University may seek documents from the bidder in addition to the scanned documents sent by them at the time of uploading technical bid for verification and evaluation of tender.

9.23 University reserves the right to relax any clause as stated hereinabove for selection of responsive vender.

10. Dates &Information:

Sl.No.	Activities	Date & Time
1	Date of uploading of N.I.T. Documents in the e-tender portal of NIC :https://wbtenders.gov.in	**19.01.2019**
2	Documents download (online)	**19.01.2019 (from 01.00 p.m.)**
3	Bid Submission Start Date(on line)	**19.01.2019 (from 01.00 p.m.)**
4	Bid Submission Closing Date (Online)	**08.02.2019 (up to 06.00 p.m.)**
5	Bid Opening Date (Online) – Technical Bid	**11.02.2019 (from 06.00 p.m.)**
6	Date of uploading list for technically qualified bidder (online)	**To be notified**
7	Date of opening of Financial Bid	**To be notified**
8	Date of uploading of list of bidders along with the approved Rate	**To be notified**

11. Opening the financial bid as per schedule will BE NOTIFIED LATER ON.

Financial bid can be seen & accessed by the bidder through the NIC Portal on line after opening of financial bid on line. No objections raised by any Bidder in this respect will be entertained by the University. No informal tender will be entertained in the Bid further.

12. During the scrutiny, if it comes to the notice to tender inviting authority that the credential or any other paper found incorrect/ manufactured/ fabricated, that bidder would not allowed to participate in the tender and that application will be rejected outright without any prejudice.

13. The Tender Selection Committee reserves to right to cancel the N.I.T. due to unavoidable Circumstances and no claim in this respect will been tertained.

14. <u>STEPS TO BE FOLLOWED FOR SUBMISSION OFE-TENDER</u>

1. SEARCHING THETENDER

After Login on www.wbtenders.gov.in with DSC Click on Search Active Tenders

In Keyword writes Tender Reference No. / Tender memo. No. or put Tender ID and click on submit on NICwebsite.

2. DOWNLOADING THE TENDERDOCUMENTS

After searching the particular tender, you will find NIT & BOQ and other document, click on those to download and save the documents.

Then fill the login Id and password which is written on top or your own login id and password; the same page will appear again click on NIT & BOQ to download.

While downloading the BOQ please do not change the name of the BOQ and quote as per the exact Accounting Unit, as mentioned.

3. UPLOADING DOCUMENTS UNDER "MY DOCUMENTS"FOLDER

First upload all the "My Documents" before starting the Bid Submission process.

While starting the Bid submission process after the EMD payment you will find an option "Do you want to submit Other Important Documents".

Here click on YES to submit the MY DOCUMENTS and then tick mark the check boxes to tag those documents in that particular tender.

4. UPLOADING DOCUMENTS UNDER "STATUTORY COVER"FOLDER

First upload Tender Document (Other than BOQ) with digital signature in

NIT Folder. Thereafter, upload Scanned Copy of all Annexure in the

Annexure Folder.

5. BOQ

While first opening the BOQ there is an option at top of the rows. "Security warning Macros have been disabled" Click on Options.

Select "Enable the content" then OK. This will enable you to visualize the BOQ.

Select the Currency (INR, USD, JPY, EUR, GBP) type from drop down list while quoting the amount against each item.

Upload BOQ in the "BOQ Folder" under "Financial Cover" after filling up financial data in the appropriate columns

6. ITEM WISEDETAILS

Select that item as Yes/No from drop down list which item bidder wants to quote the amount.

Annexure I

FURNISHING BASIC INFORMATION

(To be furnished in the Company's official letter pad)

1.	**Name of the Bidder**	
2	**Address for Communication**	
3	**Contact Number(s)**	
4	**E-mail ID**	
5	**Trade Licence No.** **(Please enclose copy of Trade Licence)**	
6	**PAN (Please enclose copy of PAN Card)**	
7	**VAT No. (Please enclose copy of VAT)**	
8	**Do you have previous experience for supplying similar nature of Items at Educational Institute of Higher Learning?** **(Please enclose copy of Purchase order & user list, if yes)**	**Yes/No** **(Please put tick mark)**
9	**Annual Turnover as per Audited P/L ACCOUNTS & BALANCE SHEET**	**2014-15 :Rs……** **2015-16 :Rs……..** **2016-17 :Rs…….** **Average Annual Turnover: Rs……..**
10	**Status of the bidder (Please enclose copy authenticating your status)**	**Manufacturer/Dealer/Distributer/Selling Agent/Stockiest** **(Please put tick mark)**

I hereby declare that the above information is true and correct to the best of my knowledge and belief. In case of any false/wrong/misleading information, I shall be bound to take the decision taken by theUniversity.

Signature of the Bidder

(With Seal)

Annexure II

APPLICATION FOR TENDER

(To be furnished in the Company's official letter pad with full address and contact no, Email address etc)

To

The Registrar

Cooch Behar Panchanan Barma University
Cooch Behar-736101

West Bengal

Sub: NIT for the Supply of **different Instruments** for the purpose of Departmental requirement for Department of Physics

Ref:-_____N.I.T. No ……..…..……dated……..

Sir,

Having examined the pre-qualification &other documents published in the N.I.T, I/we hereby submit all the necessary information and relevant documents forevaluation:

1. That the application is made by me/us on behalf of…….....…… …….....……in the capacity ……...…… duly authorized to submit the offer. The authorization letter from the Company is attached in Annexure II.
2. We accept the terms and conditions as laid down in the tender document vide **Clause 9** and declare that we shall abide by it throughout the tender period including its extensions, ifany.
3. We have gone through the Tender Document thoroughly and quoted the tendered items keeping in mind all sorts of information as furnished in the tender document including Corrigendum/Addendum as published from time totime.
4. We are offering rate for the following item /items with manufacturing capacity andassured supply to the Cooch Behar PanchananBarmaUniversity.

Sl. No.	Description of Items	Make	Model No.	Quantity	Offer Validity

4. In the event of being selected, I will make the supply within the stipulated period excepting the condition which is beyond our control.

Date:-

Signature of applicant including title and capacity in which application ismade.

Contact no:

E-mail address

Postal Address:

Annexure III

(Authorization letter in favour of the applicant (other than Managing Director/ Proprietor/Partner) from the competent authority.)

FORMAT

(To be furnished in the Company's official letter pad with full address and contact no, Email address etc)

(TO WHOM IT MAY CONCERN)

This is to certify that Mr. .....(Name),

employee of this Organisation as ..... (Official Designation) is

hereby authorised to submit tender online, Vide NIT

No....., Dated ..... on behalf of the

Organisation.

Signature of the competent authority with Seal

.....

(Signature of the Authorised Person)

Signature of Mr.....

.....is hereby attested.

Signature of the competent authority with Seal

ANNEXURE IV

(Affidavit Proforma)

(To be furnished in Non – Judicial Stamp paper of appropriate value duly notarized)

I, Sri/Smt. .....

The Managing Director/Proprietor (etc.) of theFirm.,

.....(Name of thefirm)

At (address).....

do hereby solemnly affirm and declare as follows:

1. That I have not ever been convicted of any offence making myself liable to be disqualified tosupply of Chemicals / Equipments/other items to any Govt. or Govt. undertakingOrganization /Institution in the State of West Bengal or other State or States.

2. That no case is pending against me or against my firm in any criminal court of law to supply of Chemicals, Lab. Chemicals & Laboratory Equipments and other items to the Govt. or Govt. undertaking Organization / Institution in the State of West Bengal or other State or States (If any case is pending, state thedetails).

3.That, I also declare that if any information subsequently found incorrect or false will it automatically render the tender submitted by me cancelled and make me liable for penal/legal action as per law of thecountry.

4. That my concern has not yet been declared bankrupt by any banking or money lending agency duly licensed by RBI nor has it been considered doubtful by any Government concern so far as the solvency of the organisation isconcerned.

5. That I do further affirm that the statements made by me in this tender are true to the best of my knowledge and belief and all the documents attached are genuine &correct.

Deponent(s).