TENDER DOCUMENT

FOR

SUPPLY OF LABORATORY EQUIPMENT

IN

DEPARTMENT OF PHYSICS, CHEMISTRY, BOTANY, ZOOLOGY, GEOLOGY, PSYCHOLOGY, EDUCATION, ANTHROPOLOGY, GEOGRAPHY, COMMERCE & HOME SCIENCE

AT

M.P.C. AUTONOMOUS COLLEGE

TAKHATPUR, BARIPADA

DIST- MAYURBHANJ, ODISHA -757003

Tender Document No- 064

Dated: 06-01-2025

ISSUED BY:

PRINCIPAL,

M.P.C. AUTONOMOUS COLLEGE, TAKHATPUR, BARIPADA

OFFICE OF THE PRINCIPAL,
M.P.C. AUTONOMOUS COLLEGE, TAKHATPUR, BARIPADA

No.064 **Date : 06-01-2025**

QUOTATION CALL NOTICE

Sealed tenders in prescribed Application form are invited from original manufacturer/ registered firms / dealers/ suppliers having valid GST registration, PAN and IT Clearance for the supply, installation and commissioning of laboratory equipment to the different departments of the College so as to reach the undersigned on or before 27.01.2025, 5.00 PM through registered / speed post / courier service only (No hand / e-mail delivery will be entertained). The quotations will be opened on 29.01.2025 at 11.00 AM in the chamber of the undersigned in presence of intending tenderers or their representative. The undersigned reserves the right to accept or reject any or all quotations without assigning any reason thereof. The details of terms, conditions, list of equipment, application form and financial bid form are available in the website of the college: http://mpcautocollege.org.in/

Sd/-
PRINCIPAL
M.P.C. AUTONOMOUS COLLEGE,
TAKHATPUR, BARIPADA

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SCHEDULE FOR TENDER

Tender No & Date	**064, Date: 06-01-2025**
Name of the tender issuer	Principal, M.P.C. Autonomous College, Takhatpur, Baripada, Dist.-Mayurbhanj, Odisha
Scope of Work	Supply of Laboratory equipment to the Departments of Physics, Chemistry, Botany, Zoology, Geology, Psychology, Education, Anthropology, Geography, Commerce & Home Science.
Item Details	Items to be supplied As per **Annexure I**
Date of issue of tender document	06-01-2025
Last Date & Time for Submission of Bids	27.01.2025, 5.00 PM
Date & Time of Opening of Bids	29.01.2025, 11.00 AM Principal's Chamber
Address for Communication	Principal, M.P.C. Autonomous College, Takhatpur, Baripada, Mayurbhanj, Odisha- 757003

Note: The Bidder must submit separate Financial Bid for each department.

ELIGIBILITY CRITERIA

The bidders who are desirous for above work require fulfilling the following conditions:

1) Must be registered under GST Act.

2) Should not have been blacklisted by any State Govt. / Central Govt. / PSU in India. A self-declaration is required as per Annexure IV.

3) Must have a valid PAN.

Note:

* **Documents in support of the above conditions must be attached to the tender document.**

BID SUBMISSION

Steps to be followed for submission of bids:

- The bidder must submit separate financial bids as per Annexure-II for each department.
- The bidder should supply the items strictly as per technical specification mentioned in **Annexure-I**.
- The tenderer should comply about the general information of the firm in **Annexure-III.**
- The bidder should submit the item details in **Annexure-II**, duly filled in, signed and complete in all respects. **(*No alteration / modification in the format shall be permitted).***
- A self-declaration that the tenderer has not been blacklisted by any State Government/ Central Govt. / PSU in India in **Annexure-IV**.
- A declaration from the Tenderer to supply, install and commission the items along with the Vouchers to the undersigned for the payment within 15 days from the date of issue of the work order in **Annexure-V.**
- Separate Financial bids (department wise) shall be sealed in envelope marked as "Financial Bid". The outer cover of Financial Bids must be super scribed as FINANCIAL BIDS FOR SUPPLY OF LABORATORY EQUIPMENT OF - PHYSICS, CHEMISTRY, BOTANY, ZOOLOGY, GEOLOGY, PSYCHOLOGY, EDUCATION, ANTHROPOLOGY, GEOGRAPHY, COMMERCE & HOME SCIENCE DEPARTMENTS. This shall contain the price bid in **Annexure II** duly completed in all respects.
- Rate quoted should be inclusive of GST.
- No extra cost will be borne by the college towards transportation, installation and commissioning of supplied items.
- No price increase on account of change in tax structure, duties, levies, charges etc. shall be permitted.

The department wise financial bids as per Annexure-II along with other documents should be sealed in another envelope super-scribed as **"Supply of Laboratory equipment for Departments of Physics, Chemistry, Botany, Zoology, Geology, Psychology, Education, Anthropology, Geography, Commerce & Home Science departments.**

Note: The Bidder must submit separate Financial Bid for each department.

GENERAL TERMS AND CONDITIONS OF THE BID

Note: Bidders must read these conditions carefully and comply strictly while submitting their bids.

1. Bidder shall prepare separate financial bid (department wise) and submit it in a sealed envelope addressed to the Principal, M.P.C. Autonomous College, Takhatpur, Baripada, Mayurbhanj, Odisha-757003 and send it through **Speed Post/Registered Post/ Courier only** (no hand / e-mail delivery will be entertained). Each envelope should bear the name of bidder, along with the tender number. The authorities shall not be responsible for postal and other delays in receipt of the bids.

2. Bidders are requested to check for any notice /amendment/ clarification etc. to the Tender Document through the website http://mpcautocollege.org.in/ Notice board of the office of M.P.C. Autonomous College, Takhatpur, Baripada.

3. The Bidders must clearly mention the price (item wise) inclusive of GST in the financial bid **(Annexure-II).**

4. **OPENING OF FINANCIAL BID**: The Financial Bids will be opened on **29.01.2025 at 11:00 A.M** in presence of the Tender Committee of the college, Tenderers and representative of the bidders. No separate intimation will be given to the bidders in this regard.

5. The Committee reserves the right to reject any or all the tenders without assigning any reason thereof.

6. **Award of Contract**: Financial bids with lowest price quotation for the assignment as per **Annexure-II** will be considered for negotiations and award of contract. **The supply, installation and commissioning of items must be completed strictly within 15 days from the date of issue of work order.**

7. All the information as called for in the tender document should be submitted truly, clearly, legibly, transparently, unambiguously and without using abbreviations.

8. In the financial bid the **total figures** should be **written in figures** followed by **words**.

9. **Each page of the tender document should be signed by the bidder with seal, in token of having understood and accepted the terms and conditions of the contract and serially numbered and page marked.**

10. A bid submitted cannot be withdrawn. The bidder or his authorized representative (one person only) will be allowed to be present at the time of opening of tenders.

11. The Tendering Authority reserves the right to accept or reject any or all quotations without assigning any reason thereof.

12. All the transit risks shall be the responsibility of the supplier.

13. All the disputes shall be subjected to the jurisdiction of Civil Courts situated in Baripada.

14. Any matter which has not been covered under these provisions shall be governed as per the provisions of Odisha State Government Rules.

15. **Payment Terms**: All payments will be made within 30 days of submission of Invoice, based on completion of respective terms & conditions. TDS will be deducted as per the rules. The invoice will be raised in favour of Principal, M.P.C. Autonomous College, Takhatpur, Baripada.

16. **Completion Period**: The work shall be completed in all respect within 15 days from the date of issue of work order.

17. **A firm can apply for any Part(s) or whole of the tender**.

Note: The Bidder must submit separate Financial Bid for each department.

ANNEXURE-I

LIST OF EQUIPMENT WITH TECHNICAL SPECIFICATION

DEPARTMENT OF BOTANY

Sl. No.	Name of the instrument/apparatus
1	Binocular Microscope
2	Trinocular Microscope with Camera
3	Visible spectrophotometer
4	Compact Cooling centrifuge
5	Inverter battery with machine
6	Autoclave
7	Digital weighing balance with cabinet
8	oven
9	Water bath
11	Horizontal electrophoresis unit with power pack
12	T/A apparatus
13	Wilmott's Bubbler
14	Micropipette (1ml)
15	Pipette (1ml)
16	Pipette (10ml)
17	Staining cavity block

Sl. No	Name of the instruments/apparatus	Specification (If any)	Purpose
1	Binocular Microscope	**Objective** - Semi plan Achromatic SP objectives 4X, 10X, 40X, 100X **Light Source**- 3W LED light soure high brightness, longlife (30,000hrs). LED light soure (with battery back-up) **Focusing system** - Co-axial coarse and fine controls with a focus adjustment and fine adjustment knobs	To be Used in observation of microscopic materials and permanent slides of UG and PG.

2	Trinocular Microscope with Camera	**Objective** - Semi plan Achromatic SP objectives 4X, 10X, 40X, 100X **Light Source**- 3W LED light soure high brightness, longlife (30,000hrs). LED light soure (with battery back-up) **Focusing system** - Co-axial coarse and fine controls with a focus adjustment and fine adjustment knobs **Camara** - MagCam digital camera 10MP	To be Used in observation of microscopic materials and permanent slides of UG and PG.
3	Visible spectrophotometer	**Mode** – Mannual **Light Source –** Tungstone Halogen Lamp **Wavelength** – 340 – 960 nm	To be used in measure absorption and transmission in UG and PG classes
4	Compact Cooling centrifuge	**Speed**- High speed (Max 20000 rpm)	Isolation of DNA sample for practical classes
5	Inverter battery with machine	**Battery** – 220 Ah **Machine**- 1750 VA/12V	Running of practical in the absence of current or mid of practical and chemical store in the fridge
6	Autoclave	Aluminum steel body, 45 liters	Sterilization of lab materials
7	Digital weighing balance with cabinet	**Min to max range**- 0.02g to 200gm. **Cabinet** - Glass	Measure the sample weight used in both UG and PG classes
8	oven	**Body** - Aluminum steel body, **Capacity** - 45 liters	Used in UG and PG practical classes
9	Water bath	Rectangular, 12 compartments	Used in UG and PG practical classes
11	Horizontal electrophoresis unit with power pack	Gel size - 7 * 10 cm (L*M) Buffer volume – 270ml Sample range – 8-30 Power supply – 250 v	To run DNA Sample in practical classes in both UG and PG
12	T/A apparatus	Glass made Absorption tube 10ml	Plant Physiology practical in both UG and PG
13	Wilmott's Bubbler	Glass Made Volume - 250 ml	Plant Physiology practical in both UG and PG
14	Micropipette (1ml)	Variable range (100-1000 micro liters)	To measure sample size both UG and PG
15	Pipette (1ml)	Glass made	To measure sample size both UG and PG
16	Pipette (10ml)	Glass made	To measure sample size both UG and PG
17	Staining cavity block (12 cavity)	Marble with 12 cavities	Staining used in both UG and PG

DEPARTMENT OF CHEMISTRY

Sl No.	Name of the Apparatus/Equipment	Specification
1	Asbestos centered side frame wire gauze	Size(L*B) -14x14inch Thickness-1mm Surface Treatment-Galvanized
2	Aspirator Bottle with stop cock	Material -Plastic
3	Beaker(50ml,100ml,250ml,500ml)	Borosil
4	Boiling Point Apparatus	Temperature Range : 20 above RT-2750C Stirrer Speed Control : Electronic Temperature Sensor : PT-100 Cylindrical silicon oil bath. Built-in magnetic stirrer with electronic speed controller. Glare-free back-ground light with adjustable light intensity. Provision for holding the melting point display
5	Buchner funnel	200mm Borosil
6	Burette	Capacity- 0-50 ml Borosil
7	Burette Stand with single clamp	To hold and stabilize burettes during titration or other laboratory processes. The clamp can be adjusted to hold different sizes of burettes securely
8	Blow Pipe 10"	Item Weight:60 g Item Dimensions LxWxH-28 x 1 x 1 Centimeters
9	Calorimeter	Interior Dimension-3”X4”, Material-Copper with precision thermometer
10	Capillary Tube	Borosil
11	Charcoal Block	Block 4x1 Inch For Lab Use
12	Chromatography Paper	Size- 46x57cm
13	Cobalt Blue Glass	Shape-Round Colour-Blue
14	Column chromatography	300mm,10mm bore, Borosil
15	Condenser Spiral	300mm,Borosil
16	Conductivity cell for conductivity meter	Parameters Conductivity Conductivity/TDS/℃ Range-Cond (0~2×105) uS/cm 1.0.00μS/cm-100mS/cm TDS － 0-1000 mg/LTemp － (0.0 ~ 60.0)℃ Accuracy-Cond ±1.0%FS ±1bit ±0.5%FSTDS － ±1.0%FS Temp － ±0.3℃±1bit Temp. Compensation (5 ~ 35)℃, manual (0.0 ~ 40.0)℃, auto/manual Power 220V/110V Dimension/N.W. 300×200×90 mm / 1.5kg Shipping size/G.W. 330×260×280 mm / 2kg
17	Conical Flask stoppered(100ml,250ml,500ml)	Borosil
18	Conical Flask(100ml,250ml,500ml)	Borosil
19	Copper foil	Copper foil Sheet
20	Copper water bath	Hemispherical Copper Water Bath is made from thick copper sheet, with two handles and set of concentric rings. Total Diameter is 145 mm.

21	Desiccators	With a porcelain plate 300 MM
22	Digital Balance	(sensitivity-3 decimal) Accuracy-0.001 gm Calibration-Automatic External Pan Size-90mm dia Capacity-220g Display-LCD With Backlight
23	Digital potentiometer	High quality precision manual instrument Accurate End point Uniform Stirrer mV Range : 0 - +1999 Resolution : 1 mV Readout : 3 ½ digit LED
24	Digital photoColorimeter	Wavelength Range-400nm to 660 nm. Minimum Volume-1 ml Light source : White LED Display : 3 Digit LED
25	Digital Calorimeter	Wavelength Range 400-700 nm Minimum Volume-1 ml Std Glass Filters-Built in 9 Digital filters 30,000 hours Life Display-Dual Digital Display Accuracy:+ 0.01 O.D. Detector-Silicon Photodiode Filter Range-400 nm, 430 nm, 500 nm, 520 nm, 540 nm, 580 nm, 600 nm, 620 nm, 680 nm Light Source-Highly Accurate Laser Source Stability+ 0.02 O.D. Per Hour
26	Digital conductivity meter with cell and temp.probe	With temperature sensor ranging from 0 to 2000 micro siemens
27	Digital conductivity meter with cell and temp.probe	Conductivity & Temperature Range Five Ranges: - 0-200 µS/cm, 0-2µS/cm, 0-20 µS/cm, 0-1000 µS/cm Range Selection Automatic in 5 Auto Ranges Accuracy Cond. Temp. ±0.5% FS, ± 1 Digit Temp. ± 0.1°C ± 1 Digit Temperature-Automatic 0-50°C Cell Constant-Adjustable Conductivity Cell-Platinum DIP Type Resolution Cond. Temp-0.1 S/cm, 0.1°C Power Supply-12V DC Adapter (230V ± 10% AC, 50 Hz) Dimension-195X225X65 mm (LXBXH)
28	Digital pH meter with electrode and temp.probe	pH measurement range: 0 - 14 pH Probe principle: Ag/AgCl Probe body: epoxy Probe length: 160mm Diameter: 12mm Cable length: 1 meter

		Parameters of temperature probe TP-07: Sensor type: Transistor Temperature range used: 0 to 60 ℃. Accuracy : ± 0.8 ℃
29	Dropper	
30	Dry oven	20L capacity,700W,50 to 150^{O}C
31	Fridge	320 L capacity,5-star efficiency
32	Fume hood with motor	Rust Free Fume Hood Fire retartent material | Attractive colours | Easy to install | One small sink | Two gas points | Two LED lights | Hingless Door Special table top which doesn't react with any acid alkalies solvent, 100% stain proof, high gloss black in colour Tailor made size Universal fume Hood
33	Fourier Transform Infrared (FTIR)	Signal detected: Infrared absorption Elements detected: Molecular functional groups Detection limits: 1–10 wt% for known components, 5–20% for unknown components ATR depth resolution: About 0.1–1 micron Wavelength range: 8300 to 350 cm-1 Spectral resolution: 0.5 cm-1 Wavelength accuracy: 0.1 cm-1 to 3000 cm-1 Signal to noise ratio: 50000:1 peak to peak 4 cm-1 resolution for a one minute measurement Wavelength precision: Better than 0.01 cm-1 at 3000 cm-1
34	Funnel	Borosil
35	G4 crucible	MaterialBorosilicate Glass Capacity-50ML
36	Glass Rod	Borosil
37	Ice bath	Borosil
38	Kipp's apparatus	1000ml capacity
39	L -Shape Delivery Tube	Borosil Used for lime water test
40	litmus paper(Red,Blue)	
41	Measuring Cylinder (10ml,50ml,100ml,500 ml,1000ml)	Borosil
42	Melting point apparatus	TFT Screen Available with high resolution camera for viewing capillaries Display 4 Digit, 7-Segment LED Display Temperature 0 – 300 °C Resolution 0.1 °C Capillary Glass Tubes 75mm long, 0.8 to 1.1mm internal diameter Boiling Point Glass Tubes 6×75 mm glass tube Sample Amount Fine powder properly dried at a temperature considerably below its melting point 4 – 6 mm high Oil-Bath Silicon oil-bath beaker 200 ml capacity with Teflon cover fitted with oil immersion heater.

		It has three holes for holding the capillaries, boiling point tube and thermometer Stirrer Speed Controllable with front knob Power 230 V ± 10%, 50 Hz. AC Dimensions 370 x 290 x 290 mm (L x B x H) (Approx.) Weight 12 Kg (Approx.) Accessories Box of Capillaries, Glass Tubes for Liquid Sample (6x75mm) -2 Nos., Magnetic Capsule, Bottle of Silicon Oil – 250ml, Glass Cylindrical Beaker with Teflon cover for beaker fitted with immersion heater, Operation Manual, Dust Cover
43	Micro pipette	Borosil
44	Mortar pestle	
45	Muffle furnace	Type of Furnace : Electrically Heated Muffle furnace. Working Temp Range : 5 degree above ambient to 1200°C. Maximum Working temperature : 1200°C for Max 1 hr only. Temp Accuracy : +/- 3°C .
46	Quartz crucible	Material – Fused Quartz Standard Operating Temperature ~1150 Degree C (Continuous Usage) Standard Operating Temperature ~1250 Degree C (Non-Continuous Usage) Specific surface area – 720 J/kg-k Purity – 99.99% Poisson's ratio – 0.17 Refractive index – 1.5 Tensile strength – 50 MPa (Optimal) Size-100ML | 150ML | 200ML | 250ML
47	Reflux condenser Stand	200 mm for use with flasks up to 100 mL in size. 350 mm for use with flasks up to 500 mL in size. 450 mm for use with flasks up to 1000 mL in size.
48	Rubber cork	Round Shape rubber stoppers and lab-grade corks to contain liquids in test tubes and flasks
49	Separating Funnel	Borosil
50	short stem funnel (75 mm)	Diam.-60 mm Stem diam. × L-8 mm × 60 mm
51	Spatula (6")	Borosil
52	Stalgamometer	Height-2 cm Length-8 cm Width-6 cm Net Weight-350 g
53	Magnetic Stirrer	Top Plate: Chemical resistant glass ceramic plate Top Plate Dimensions: 180 x 180 mm Max. Capacity: 5 L Heater Rating: 800 W Temperature range of top surface: Ambient + 5°C

		to 520°C, Resolution 1°C Stirring Speed: Upto 1500 RPM Overload protection Input voltage: 220 V AC ± 10%, 50-60 Hz CE certified
54	Stop watch	Measuring Range-0~9 hour , 59 minutes, 59.99 seconds Resolution-0.01s Accuracy:+0.5s
55	Stopper bottle	Borosil
56	Temp.probe for conductivity meter	Cable Length-1 METER Material-Stainless Steel
57	Temp.probe for pH meter	Cable Length-1 METER Material-Stainless Steel
58	Test tube brush	Nylon Test Tube Brush, 230 mm Total Length, 90 mm Brush Length, 20 mm Brush Diameter
59	Test tube holder	Stout brass strips mounted in wooden handle to hold tubes from 12 mm to 40 mm. Overall length 220 mm.
60	Test tube Stand	Material-Plastic
61	Thermometer	Temperature measurement range:0- 300 °C Accuracy ± 0.1°C . Graduation 0.3°C or better.
62	TLC sheet	adsorption TLC Plates. Silica Gel, 10-12um particle size. For normal phase analytical TLC separations of moderate to strong polar compounds. With fluorescent indicator. Pore Size: 60A. Layer Thickness: 250um. Plate Size: 20x20cm.
63	Tongs For Crucible	Material-stainless steel L-20 in. (508 mm)
64	Tripod Stand (stainless Steel)	200 mm ht.
65	UV chamber for TLC	Size/Dimension-15 X 12 X 10 Light Source-UV lamp Automation Grade-Manual Tube Volume=12 Inch Wave Length-254nm Short Wavelength 365nm Long Wavelength UV Tube-Short UV and Long UV
66	UV Visible spectrophotometer	Wavelength selection-Monochromator Light source-Xenon flash lamp Wavelength range-200–1,000 nm with 1 nm steps Readout range-Up to 4 absorbance units Bandwidth- <2.5 nm Linearity at 450 nm*-0–2.5 Abs, 2% Accuracy at 450 nm*-1.0% + 0.003 Abs (0–2.0 Abs), 2.0% (2.0–2.5 Abs) Precision at 450 nm*-SD <0.003 Abs or CV <1.0% Plates-6- to 48-, 96-, and 6-384-well plates***, Thermo Scientific µDrop Plates Cuvette-Dimensions (H x W x D): 40–58 x 12.5 x 12.5 mm Beam center height: 8.5 mm

		Beam window: ≥2 mm Measurement speed-(starting from A1 back to A1) 6 sec with 96-well plate 10 sec with 384-well plate Plate shaking-Linear Spectral scanning speed-10 sec from 200–1,000 nm with 1 nm steps Incubation range-From ambient temperature +2C to 45˚C". Stand-alone use: 7 in. touchscreen display PC control: Thermo Scientific SkanIt Software Connections 1 USB B port for PC 1 Ethernet port 3 USB A ports for devices (USB memory device and Wi-Fi dongle) Dimensions (H x W x D)-265 x 295 x 445 mm (10.4 x 11.6 x 17.5 in.) Weight-True weight: 10.6 – 11.5 kg (23.4 – 25.3 lb), depending on the model
67	vacuum pump	Double stage vacuum pump with oil capacity of 325 ml with a flow rate of 113L/min.
68	Visible spectrophotometer	Wavelength range: 190–1100 nm Optical system: double beam or single beam Spectral bandwidth: The width of the spectral band, typically 1–4 nm Wavelength accuracy: ±0.1–0.5 nm Wavelength repeatability: ±0.06–0.3 nm Photometric accuracy: ±0.3% T or ±0.001A Lamp type: tungsten halogen or deuterium
69	Volumetric Flask(50ml,100ml,250ml,500ml,1000ml)	Borosil
70	wash bottle	Capacity-500 mL Dimensions (OD x H)-2.75 x 9 in
71	Watch glass (80mm,100mm)	Borosil
72	Whatmann 40 filter paper	Filter Paper: 40 Grade, 11 cm Dia, 0.21 mm Thick, Medium [PK/100]

DEPARTMENT OF GEOLOGY

SL. NO.	NAME OF THE EQUIPMENTS	SPECTIFICATION
1	Ore Microscope	Eye Piece with magnification - set of two for binocular 5 x Objective Magnification - 10 x ,20 x ,40 x ,4X Type of lamp for Illumination**:** halogen Size of Stage: 150MM
2	Binocular Polarising Microscope	Microscope Type - research binocular non hinged type with built in light and with light intensity regulator Eye Piece with magnification Set of Two for Binocular - 10x Objective Magnification - 10 x ,40 x ,4X Type of lamp for Illumination**:** halogen Size of Stage: 150MM
3	Brunton Compass	-
4	Mirror Stereoscope	-

DEPARTMENT OF ZOOLOGY

Sl. No.	*Name of Equipment*
1.	**Compound Microscope (Monocular)***
2.	**Trinocular Microscope (With Camera) ***
3.	**Burette Stand***
4.	Thermometer Industrial
5.	Rotary Microtome
6.	**Paper chromatography Unit***
7.	**Gel electrophoresis Unit with Powerpack***
8.	Digital pH Meter
9.	**Transilluminator***
10.	Hemoglobinometer
11.	Hemocytometer
12.	TDS meter
13.	Southern Blotting Teaching Kit
14.	**Digital Spectrophotometer***
15.	**Laboratory Refrigerator double door***

***Marked are needed on priority basis.**

Sl No.	*Name of Equipment*	*Reason/Purpose*	*Specifications*
1.	Compound Microscope (Monocular)	To view Slides Cytological experiments Study of mitosis and meiosis BSc and PG all semesters	**Product Specification** **Light Source** Halogen/LED **Magnification** 1000x **Eyepiece:** 10x WF **Objectives**: 4X, 10X, 40X, 100X **Illumination:** Lower, Halogen, **Adjustable** **Lens Type:** Apochromatic **Warranty:** 1 year **Head Type:** Monocular **Focusing System** - Co-axial coarse & fine focusing control with a focus adjustment and find adjustment knobs

2.	Trinocular Microscope (With Camera)	To view Slides of Cytological experiments and dissection in real-time. BSc and PG all semesters	Microscope set complete with Binocular head, integrated 6V 20W, LED illuminator, Anti-Fungal coated Achromatic Objectives- 4x,10x,40x (spring) & 100x (oil, spring), paired wide **Features:** Anti-fungus treatment optics for tropical durability, Achromatic Objectives, Abbe condenser with high performance aspheric lenses for bright & uniform illumination throughout the field of view, Window in arm for convenient carrying & Ergonomic design for user convenience, SMPS power supply for flicker free Illumination etc. Attached with Full HD Camera for Imaging
3.	Burette Stand	For Titration BSc Semester-I (CORE-II) PG Semester - II	**Product Specification** **Material-** PPE or PVC **Size**- Standard Application/Usage- Laboratory
4.	Thermometer Industrial grade	To measure temperature of different liquid samples BSc Semester-I (CORE-II) BSc Semester-III (CORE-VII) PG Semester III	Standard Laboratory and industrial grade thermometer Made up of Glass
5.	Microtome	For preparation of permanent slides BSc Semester-III (CORE-VI)	**Product Specification** Section Thickness Setting- 1um-50um **Specimen Stroke**- 25mm **Microtome Dimensions**- 300-400mm Specimen Orientation 180 deg. Material- alloy steel Object Feed- min. 1micron External Size- 450mm-350mm Minimum Setting Value- 1micron, Razor high profile blade holder
6.	Paper chromatography Unit	Separation and Identification of different Amino acids BSc Semester-III (CORE-VII) PG Semester II	**Product Description** Thin Layer Chromatography Kit, Comprising Of Moveable Applicator (Spreader) With Built In Arrangement, 0- 2 Mm, Perspex Base Plate 114 X 23 Cm. Aluminium Carrier, Perspex Spotting Temp Plate, Developing Chamber With Lid, Five T.L.C. Plates 20 X 20 Cm.,Two T.L.C. Plates 20 X 5 Cm., Scriber For Marking Lines, Micropippete And

			Glass Sprayer With Rubber Bellow.
7.	Vertical Gel electrophores is unit	Separate DNA Bands according to their size and molecular weight BSc Semester-III (CORE-VII) BSc Semester-V (DSE-I) PG Semester III	**Product Description** Volume - 150mL Buffer, Length 7.1, 10cm, Width 10cm Height 5.1 in,13cm Dimensions - 7.1 x 3.1 x 5.1 in. (18 x 8 x 13cm) (L x W x H) **Includes:** Upper and lower buffer chambers, lid with attached power supply leads, Blank glass plate, Notched glass plate, Notched alumina plate, Two combs (10 well, 0.8mm thick) Spacer set (0.8mm thick)
8.	Digital pH Meter	To measure the pH of different type of mixtures and solutions BSc Semester-I (CORE-II) BSc Semester-III (CORE-VII)	**Product Specification** Digital pH meter, Cable Length - 5m, pH Range 1-14 pH, Degree of Protection IP67, Calibration - Automatic
9.	Transilluminator	To visualize the DNA Bands separated from Agarose gel slab BSc Semester-III (CORE-VII) BSc Semester-V (DSE-I) PG Semester III	**Product Specification** Usage/Application - visualization of gel, Power Voltage: DC 24V Power Adapter wavelength 470nm Suitable for Long-term energy conservation and environmental protection. Perfect observation with full size transparent optical filter. Safe operation, no need to wear safety glasses or other protection device. Different dyes such as EtBr, SYBR Safe, SYBR Gold, SYBR Green I & II, SYPRO Ruby, SYPRO Orange, Coomassie Fluor™ Orange stains, GelGreen, GelRed and Lumitein™ Protein Gel Stain can be seen.
10.	Hemoglobinometer	To measure the amount of hemoglobin in blood. BSc Semester-IV (CORE-IX) PG Semester II	**Product Specification** Differential Type- 2-Part Number of Chambers- 1 Instrument Type- Haemometer Tube Length-16 cm, Material-Silicon Capacity- 20 Microliter **Other Details:** It consisting of polystyrene support with 2 coloured rods and opal glass plate comparator tube haemoglobin pipette 20 µl acc. to Sahli silicone tubing of approx.

			16 cm length white mouthpiece dropping pipette with rubber teat, stirring rod acid vial cleaning brush directions for use.
11.	Hemocytometer	To measure the number of RBC and WBC in blood. BSc Semester-IV (CORE-IX)	**Product Specification** MATERIAL- Glass, GRID- Plain **Blood Counting Chamber** Product Description - One-piece construction. Supplied with two cover glasses. With Case. This consists of 16 one square millimeter areas orientated by triple lines, and each such area sub- divided into 16 squares.
12.	TDS meter	To measure the amount of Total Dissolve Solutes of a given Water Sample. BSc Semester-I (CORE-II)	**Product Specification** Measure Range 0.00 to 10.00 ppt **Usage/Application** FIELD APPLICATION Accuracy Up to +-1 % full scale accuracy Warranty minimum 1 Year Resolution 0.1 ppt Batteries 4 x 1.5 V 'A76' micro alkaline batteries
13.	Southern Blotting Teaching Kit	For the identification of particular size of DNA from the mixture of other similar molecules. BSc Semester-V (CORE-XI) BSc Semester-V (DSE-I) PG semester IV	**Specifications:** Principle Material- Imported Acrylic No. of Samples- 8+8=16 Nos. Casting Unit- Inbuilt Platinum electrodes- 99.99% pure, Fixed with protection Dimensions- 84X165X30 (LXWXH)D C Power supply Input Voltage- 230 V +/-10%, 50 Hz. AC Output Voltage- 50 or 100 V DC @ 100 mA Buffer Required- 250 ml Approx Gel size- 60X50 mm, Voltage/current- 3-5 V/2.5 A max Electrodes- 99.99% pure Platinum
14.	Digital Spectrophotometer	To analyses different samples and their concentrations by measuring the absorbance in different wavelengths. BSc Semester-V (CORE-XI) BSc Semester-V (DSE-I) PG	**Wavelength Range** – 340 to 960nm (Single Beam or Double Beam) **Display** - LCD or LED **Light Source** – Tungston Halogen Lamp **Sample Holder** – Single or Multiple **Min. Sample volume** – 1 ml in 4 ml Cuvette. **Operating Mode** – Automatic **Measurements** - % Transmission - Absorbance Concentration

		Semester III	**Accessories** – Quartz Cuvettes, Software for analysis the data, Computer attached - facility
15.	Laboratory Refrigerator double door	For storing different chemicals and solutions at a particular temperature. BSc and PG all semesters	Conformity to Standards CE (with 4 digit notified number) Electrical safety standards IEC 6010 Capacity of the refrigerator in liters 340-360 or above Type of Door: Double door Refrigerator Energy star rating:- 4+ Number of shelves: 5 Warranty of the refrigerator in years: 3 with ANC Controller based audiovisual alarm: Yes Warranty of Compressor in years: 5-10 years

DEPARTMENT OF ANTHROPOLOGY

Sl. No.	Name
1	Skull
2	Monocular Microscope
3	Monocular microscope
4	Anthropometric Rod (Stainless Steel)
5	Anthropometric Rod (Fixed to Floor)
6	Weighing Machin (Analog)
7	Spreading Caliper (Pointed)
8	Spreading Caliper (Blunted)
9	Cescrof Measuring Tape (6m X 2mm)
10	Isihara Colorblind Chat Book
11	Skin Fold Caliper
12	Dermatological Ink (Keros Finger/Palm print Ink) -Black
13	Rubber ink Roller
14	Wooden Pad (for palm print)
15	Cotton (Big size)
16	Mask
17	Surgical Gloves
18	Various Primate Fossil (Cast Model)
19	Archaeology Chronological Time Scale Chart
20	Taxonomy Chat (Animal Kingdom)
21	Pedigree Chat
22	Genealogical Chat
23	Schedule Tribe List Chart (India and Odisha)
24	Schedule caste List Chart (India and Odisha)
25	Stone Age chart (Lower to Upper)/ types of tools and technology in different cultural period
26	Stone Age chart (Mesolithic) types of tools and technology in different cultural period
27	Stone Age chart (Neolithic) types of tools and technology in different cultural period
28	Chalcolithic Period chart (copper materials)
29	Skull holding clamp
30	Haemoglobin Chemical (1- set)
31	Mounted Slide for Microscope
32	Mustard Bag
33	Lancet needle
34	Lancet needle device
35	Tabular Craniophor with stand in clamp
36	Cubic Craniophor with stand in clamp
37	Clinometer compass brass make
38	Attachable Goniometer

39	Diagraph brass make
40	Stethoscope superior Quality
41	Vital Capacity
42	Thermometer
43	Glass slides (for blood grouping)
44	Blood grouping serum
45	Fetal skull model
46	Human skull(human colour medical skull model)
47	Human skin model anatomy
48	Human skull model (replica realistic human adult skull bone model)
49	Hand pipette(1ml,2ml,5ml,10ml)
50	Cell structure model

DEPARTMENT OF HOME-SCIENCE

SL.No.	Name of the Apparatus
1	Refrigerator
2	Hand blender
3	Washing machine
4	Air fryer
5	OTG Oven
6	Dish washer
7	Mini-chopper
8	Pressure-cooker
9	Dinner set
10	Electric rice cooker
11	Casserole set
12	Kadhai set
13	Roti rolling pin & Board
14	Fruit juicer mixer and grinder
15	Electric kettle
16	Thermoplast

DEPARTMENT OF EDUCATION

SL. No	Name of Equipment	Specification
1	Smart Board	
2	Psychological Tests	

DEPARTMENT OF PSYCHOLOGY

Sl. No.	**Name of the Apparatus**
1.	Two Computers. One projector and Statistical package for social Science (SPSS) Software
2	Weight discrimination box
3	Mirror Drawing Apparatus
4	Tachistoscope Fall Door Apparatus with Cards –(Span of Attention)
5	Memory Drum Apparatus
6	Division of Attention Board Apparatus
7	Normal Probability Curve Demonstration
8	Phi-Phinomena Apparatus
9	Wooden Blocks Apparatus
10	Wooden Screen Apparatus
11	Verbal Conditioning Apparatus
12	Two-Hand Coordination error Counter
13	Tachistoscope Cards (40 meaningful and 15 Non-Meaningful) Apparatus
14	Stop Watch Mechanical Apparatus
15	Stop Watch (Timer) Apparatus
16	Steadiness Tester Electrical Apparatus
17	Size Constancy Apparatus
18	Size and Weight Illusion Box Apparatus
19	Retroactive Inhibition Apparatus
20	Prestige Suggestion Test- Equipment's & Apparatus
21	Muller Lyre Apparatus
23	Metronome Apparatus

25	Human Physiological Chat (Equipment's & Apparatus)
26	Human Organs (Models) Brain, Eye, Ear, Nose- Equipment's & Apparatus
27	Fluctuation of Attention Apparatus
28	Galton Bar- Brass with Stand- Equipment & Apparatus
29	Aesthesiometer Caliper (Two point metal head) Apparatus
30	Aesthesiometer with pressure control System
31	Horizontal Vertical Illusion Apparatus
32	Wechsler Adult Intelligence scale (WAIS-IV)
33	Intelligence test by Raven's standard progressive matrices.
34	Ink Bolt technique (by- H. Rorschach)
35	Thematic Apperception Test by Murry & Morgan.
36	Glazer's test of personality type
37	Rotter's locus of control scale
38	Schutte's emotional intelligence scale
39	Ethical Values questionnaire by - Donelson's ethical position questionnaire
40	Attitude towards women scale by Spence, Helmrich & Stapps
41	Anxiety scale by Hamilton Anxiety Rating Scale (HARS)
42	Depression scale by Beck's Depression Inventory (BDI)
43	Academic behaviour Scale by Sia
44	Academic stress scale by Rao
45	Student gender equality questionnaire
46	Young's internet addiction test
47	Empathy questionnaire by Spreng
48	Sense of humour scale by Mc Ghee
49	Leadership Style scale by Greenberg
50	Conflict Handling scale by Rahim
51	Coping strategies inventories by Tobin
52	Sleep Quality Index (PSQI) by Pittsburgh
53	Couple adjustment scale by Lener –Marital relationship
54	Spiritual intelligence test by King
55	Happiness measure by Oxford happiness questionnaire

56	Word association test - The Jung / Kent-Rosanoff
57	Quality of life - WHO quality of life (QOL) scale (Shorter version)
58	Rao's achievement motivation test
59	Environment literacy and awareness survey questionnaire by Bob Simpson
60	Disability policy in India - Questionnaire
61	Attitude towards disabled persons scale by Yurker
62	Disability policy in India using Questionnaire
63	Self- Concept Questionnaire
64	Mental State Examination (MSE)
65	Assessment of Personality - 16PF personality text
66	Digit Span test (Wechsler adult Intelligence Scale)

DEPARTMENT OF GEOGRAPHY

SL. No	Name of the equipment
1	Aneroid Barometer
2	Drawing Compass
3	Scientific Calculator
4	Divider
5	Flexible curve ruler (60 cm)
6	GPS
7	Hygrometer
8	Land measuring instrument
9	Big Magnifying glass
10	Trough compass
11	Plainmeter Plain
12	Planimeter Digital
13	Protector semi circle
14	Protector round (Omega big size)
15	Protector pro Circle (Omega big size)
16	Rotameter
17	Scale 30cm (Dayal Plastics)
18	Scale 30cm (Omega Plastics)
19	Set Square
20	Mirror Stereoscope
21	Stencil (Omega three in one)
22	Prismatic compass and accessories
23	Spirit Level
24	Measuring tape (100m)

DEPARTMENT OF PHYSICS

Sl. No	Name of the Equipment/Instrument	Specification
1	To study surface tension by capillary rise method.	Digital Travelling microscope Number of Axis: 1 (Vertical) Base: Cast Iron Moving Parts: Brass Focus: Adjustable Free movement: 150mm Micrometer movement: 10mm Least count: 0.01mm Capillary stand and beaker holder T Desktop Material: Acrylic Reference Pointer Capillary tube: Changeable (3 different diameter) Beaker: Max size 250 ml **Display: LCD** Detector: Resistive type Power: AC 220V/50Hz or AC 110V/60Hz
2	To determine the height of a building using a Sextant	Graduated : -5° to 125° into 1° on the arcMicrometer : Divided to 1 minute on black drum Index Mirror : Rectangular, 33x49mm aluminum spattered Horizon mirror :Circular, 50mm diameter, one half transparent, other half aluminum separated Shade glasses: Three different densities for direct rays and four Reflected rays. Star Telescope: Galilean monocle 4x40 mm Illuminator: Equipped, Adjusting tools: 1-wrench for mirror Spare parts: 2-dry cell, 2 bulbs, Case: Hard wood Weight of sextant:1.9kg/Stand:(m.s) 6 feet stand Tripod Stand Weight of case: 2kg, Telescope: Terrestrial
3	To study the Motion of Spring and calculate (a) Spring constant	1.5 meter long metal stand having marking 0-50 cm on one rod, Set of weight of 5x 50 gm.
4	To determine the Moment of Inertia of a Flywheel	Flywheel consists of a steel disc 250 mm old x 30 mm wide. Which is integral with a shaft running in ball bearings.The periphery f the disc is an engraved mark which passes a pointer as the flywheel revolves. The bracket carrying the flywheel should be bolted to a vertical Surface Sufficient free fall to drive the flywheel for up to 10 revolutions, Meter Scale & Digital Stop Watch
5	To determine Coefficient of Viscosity of water by Capillary Flow Method (Poiseuilles method).	Constant water level reservoir can be adjusted on MS chrome plated rod on tripod stand Pinch cock, Graduated cylinder 100ml Manometer on wooden stand Glass capillary tube of length 38cm on stand

		Optional essential accessories Stopwatch Rubber tube of length 1mtr
6	To determine the Modulus of Rigidity of a Wire by Maxwell's needle	Hollow cylindrical brass tube of length 40cm, Maxwell's needle, Wall Bracket, Wire, Screw Gauge: Material: Stainless Steel, Range: 0-25mm, Finish: Metallic, Meter Scale- 1 meter (wood), Digital Weighing Balance: Body: Plastic, Capacity: 700g, Least Count: 0.1g, Stopwatch: Count: 1/100 second, Time display: Hour, Minute, Seconds (Optional)
7	To determine the value of g using Bar Pendulum	Brass Bar : 100 x 3.75 x 0.5 cm^3 (Drilled with 19 holes at equal distances of 5 cm) Wall bracket : 1no
8	To determine the value of g using Kater's Pendulum	Steel rod : 100 cm in length, 1.2 cm diameter SS adjustable masses : 600g & 300g (each) Meter scale : length 1m Removable sharp knife edges-2nos Adjustable wooden light masses-2nos Wall bracket-1no
9	To study the characteristics of a series RC Circuit	Built in DC Regulated Power Supply :0-12V (Variable) Voltmeter : 0-12V (Moving Coil) Galvanometer : 1-0-1 (Moving Coil) Resistances :10KΩ,15KΩ & 18KΩ Capacitors : 1000 µf,2200 µf & 4700 µf Toggle Switch 2way,Necessary Patch Chords
10	To determine an unknown Low Resistance using Potentiometer	Potentiometer with jockey Resistance module 10 ohm Resistance modules 0.5,1,1.5 & 2.5Ω(each) Sensitive Galvanometer 20µA/Div. Thick brass strip Power supply 2V/100mA Connecting leads (red & black) 50cm (pair) Connecting leads black 25cm Unknown low resistance (appx 0.22 & 2 Ω)
11	To determine an unknown Low Resistance using Carey Fosters Bridge	Carey-Foster-bridge with jockey, Resistance module 10 ohm, Resistance modules 0.5,1,1.5 & 2.5Ω (each), Sensitive Galvanometer 20µA/ Div., Thick brass strip, Power Supply 2V/100mA, Connecting leads (red & black) 50cm (pair), Connecting leads black 25cm. Unknown low resistance (approx. 0.22 & 2Ω)
12	To compare capacitances using DeSauty's bridge	Decade resistance dials value 10x1000Ω,10x100Ω,and 10x10Ω Decade resistance dial value 10x100Ω Unknown Capacitor Fixed standard capacitors value 0.01µf & 0.1µf (loss free), Digital Null Detector
13	Measurement of field strength B and its variation in a solenoid (determine dB/dx)	POWER SUPPLY 0-16V, 5A ● Voltage : 0-16V DC continuously variable & stabilized ● Voltage display : 3½ digit LED, Ripple : Less than

		25mV ● Current : 5 A continuously variable, 10% to full rating ● Current display : 3½ digit LED GAUSS METER WITH AXIAL PROBE ● Range : 200 Gauss & 2 k Gauss SED -1001 ● Resolution : 0.1Gauss at 0 - 200 Gauss ● Axial Hall Probe : InAs, Display : 3½ Digit LED INDUCTION COIL SETS ● Material : Copper OD(mm) L (mm) N R (Ω) L (mH) I max 40 75 165 0.7 0.5 2A 40 100 220 1 0.71 2A
14	To verify the Thevenin and Norton theorems	**Thevenin and Norton theorem circuit trainer**Power Supply Unit :9V DC & 5VDC Plug in Board Digital Voltmeter Digital Ammeter Connecting Leads red & black (each) Variable resistance module Resistance modules 10,22,50,75,100,150,220,560**Ω**
15	To determine self-inductance of a coil by Andersons bridge	Duall Source AC& DC (Option) Variable resistance 0-100 ohm's, Resistance dials 10x10, 10x100 & 10x1000 ohm's, Standard capacitor 0.1µf and 0.2µf, Resistance 1000 ohm P and Q, Unknown inductance L, Digital NULL Detector
16	To study response curve of a Series LCR circuit and determine its (a) Reso- nant frequency, (b) Impedance at resonance, (c) Quality factor Q, and (d) Band width	**Series Resonance circuit** **(Bread Board)** Plug in Board (Honey Comb) Plastic Box Digital AC Ammeter (TRMS) Resistance Module 1K**Ω**,2K**Ω**,3.3K**Ω**(each) Inductor 225mH,Capacitor 0.01µf,0.1µf Connecting leads (red & black) 50cm pair Signal Generator 200 Khz(Sine Square& TTL)
17	To determine the frequency of an electric tuning fork by Melde's experiment and verify 2-T law	Heavy steel fork ,Heavy cast iron base, Electromagnet , Weight box 1, Voltage source 1.5V – 12V / 3A, Pulley with clamp Reel of thread, ,Scale pan
18	To plot the I-D curve and to determine the refractive index of a prism	**SPETROMETR-** Scale: **Brass (Strictly),** Base Dia:170mm , Objective: Achromatic lens, f = 178mm,Aperature 32mm, Slit : Brass with micrometer (German Silver with knurled screw), Reticle : 90 cross etched on glass, Eyepiece : 15X, Ramsden eyepiece, inbuilt magnifier, Base: 190mm Triangular, Cast Iron, **PRISM -** Size: 38x38mm, Height: 38mm, Material: EDF, **PLANE DIFFRACTION GRATTING-** Diffraction Grating: 15000 lines/ 6000 lines , **SODIUM LIGHT SOURCE (Optional)-** Sodium light Lamp: 35 watt., Transformer with metal Box, Lamp house: 300x85mm(Lxdia), Aperture dia: 25mm, **MERCURY**

		LIGHT SOURCE (Optional)- Mercury Vapour Lamp: 125 watt., Transformer with metal Box, Lamp house: 250x100mm(Lxdia), Aperture dia: 25mm
19	To determine refractive index of the Material of a prism using sodium source	**SPETROMETR-** Scale: **Brass (Strictly),** Base Dia:170mm , Objective: Achromatic lens, f = 178mm,Aperature 32mm, Slit : Brass with micrometer (German Silver with knurled screw), Reticle : 90 cross etched on glass, Eyepiece : 15X, Ramsden eyepiece, inbuilt magnifier, Base: 190mm Triangular, Cast Iron, **PRISM -** Size: 38x38mm, Height: 38mm, Material: EDF, **PLANE DIFFRACTION GRATTING-** Diffraction Grating: 15000 lines/ 6000 lines , **SODIUM LIGHT SOURCE (Optional)-** Sodium light Lamp: 35 watt., Transformer with metal Box, Lamp house: 300x85mm(Lxdia), Aperture dia: 25mm, **MERCURY LIGHT SOURCE (Optional)-** Mercury Vapour Lamp: 125 watt., Transformer with metal Box, Lamp house: 250x100mm(Lxdia), Aperture dia: 25mm
20	To determine the dispersive power and Cauchy constants of the material of a prism using mercury source	**SPECTROMETR**: Scale: **Brass ,** LC: 20 Second, Base Dia:170mm , Objective: Achromatic lens, f = 178mm,Aperture 32mm, Slit : German Silver with knurled screw, Reticle : 90 cross etched on glass, Eyepiece : 15X, Ramsden , Vernier: 2 verniers, Base: 170mm dia, Aluminium casting, Special Features: Manufactured on CNC Machine, **PRISM** : Size: 38x38mm, Height: 38mm, Material: EDF, **PLANE DIFFRACTION GRATING**: Diffraction Grating: 15000 lines/inch, Size: 38x50mm, **MICROMETER SLIT**: Pitch: 0.5mm, Least count: 0.005mm, Range: 0-6.5mm, Diameter: 38mm (approx), **SODIUM LIGHT SOURCE** : Sodium light Lamp: 35 watt., Transformer with metal Box, Lamp house: 300x85mm(Lxdia), Aperture dia: 25mm, Starting Voltage: 470V, Input Voltage: 220V, 50Hz
21	To determine wavelength of sodium light using Newton's Rings	**COMPACT NEWTON'S RING MICROSCOPE: ALL iN ONE ASSEMBLY** Eyepiece: Ramsden 10x, Objective: 3x, Micrometer: 0.01 mm least count: Dimension: 390x480x170mm approx, Weight: 12.6kg approx.**, SPHEROMETER (DISC BRASS):** Types: 3 legs, Vertical scale: 6mmx6mm (WxT), Micrometer: Dia. 40mm, Brass, Lower disc: Dia. 60mm, Range: 10-0-10mm, Least count: 0.01mm**, PLANO CONVEX LENS:** Dia.: 61.5mm, Glass, Focal length: 200mm**, SODIUM LIGHT SOURCE:** Sodium light Lamp: 35 watt., Transformer with metal Box**,** Lamp house: 300x85mm (Lxdia), Aperture dia: 25mm
22	To determine wavelength of (1) Na source and (2) spectral lines of Hg source using plane diffraction grating	SPECTROMETER: 7" dia circle reading 20 seconds. Diffraction Grating :Hilger& Watts, Type, 15000 line per inch/6000 lines per cm **HYDROGEN TUBE** Gas : Hydrogen research grade Violet : 420, 440nm, Blue : 490nm, Red : 670nm

		SPECTRUM TUBE POWER SUPPLY Input Voltage : 220V, 50 Hz AC Output Voltage : 0-5000V (open circuit) Over load : 2mA (Max.) with reset switch
23	To determine dispersive power and resolving power of a plane diffraction grating.	**SPETROMETR-** Scale: **Brass (Strictly),** Base Dia:170mm , Objective: Achromatic lens, f = 178mm,Aperature 32mm, Slit : Brass with micrometer (German Silver with knurled screw), Reticle : 90 cross etched on glass, Eyepiece : 15X, Ramsden eyepiece, inbuilt magnifier, Base: 190mm Triangular, Cast Iron, **PRISM -** Size: 38x38mm, Height: 38mm, Material: EDF, **PLANE DIFFRACTION GRATTING-** Diffraction Grating: 15000 lines/ 6000 lines , **SODIUM LIGHT SOURCE (Optional)-** Sodium light Lamp: 35 watt., Transformer with metal Box, Lamp house: 300x85mm(Lxdia), Aperture dia: 25mm, **MERCURY LIGHT SOURCE (Optional)-** Mercury Vapour Lamp: 125 watt., Transformer with metal Box, Lamp house: 250x100mm(Lxdia), Aperture dia: 25mm
24	To determine Mechanical Equivalent of Heat, J, by Callender and Barnes constant	Calendar and Barn's continuous flow calorimeter, AC Ammeter : 0- 3A (Moving Coil), AC Voltmeter : 0-10V (Moving Coil), Thermometers : 10°C to 100°C -2nos, Measuring cylinder : 0 to 100mg, DC Supply : 2V to 12V/3A, Three Flow Water containg Beaker -1 no, Rubber tubing : 8mm - 2Meter, Digital Stop-watch. (TPSM-001)
25	To determine the Coefficient of Thermal Conductivity of a bad conductor by Lee and Charltons disc method	Hollow metal box MS chrome plated rod, Thread reel, MS painted base Chrome plated brass disc, Disc made of ebonite and glass Steam generator, Steam Chamber, Glass beaker 250ml Lee disc stand with base plate Two thermometers : 10 to 100°C ,Rubber tube TPSM - 005
26	To determine the Temperature Coefficient of Resistance by Platinum Resistance Thermometer (PRT)	Platinum Resistance Thermometer, Three in one (Callender & Griffth bridge, Carry Foster bridge and potentiometer), Galvanometer ,Hypsometer Copper, Power supply 2V DC 100mA, Connecting leads red & black 50cm (pair), Hot plate, Banana lead socket with U clip, Thermometer -10^{o} to 150^{o} c x 1^{o}c, Connecting lead red & black 100cm(pair), Instruction manual
27	T o study the variation of Thermo-Emf of a Thermocouple with Difference of Temperature of its Two Junctions	10 wire potentiometer with jockey- 1nos, Unit of electronic standard cell 1.018V- 1nos, Battery eliminator 2V/100mA- 1nos, Rheostat 0-5 K ohm & thermometer- 1nos, Hot plate- 1nos, Sensitive galvanometer 30-0-30,22Ω- 1nos, Resistance box, dial type - 1nos, Flexible plug leads- 8nos, 'A' Base- 1nos, Rod 50cm- 1nos, Engine oil 250ml- 1nos, Beaker 250ml- 2nos, Two way plug key- 1nos, Thermocouple copper-Iron- 1nos

28	To determine J by Caloriemeter	Joules Calorimeter Digital Voltmeter 19.99VDC Digital Ammeter 19.99ADC Batter Eliminator 1.5 to 12V AC/DC 3A Rheostart,Connecting Wires Thermometer
29	To determine the specific heat of liquid by the method of cooling	Digital 2A DC Power Supply, Digital Balance A Base,Rod,Clamp, Copper boiler with power cable Thermo flask Digital Thermometer Liquid sample Glass Material Pack Bottle Glass Beaker, Rubber Tube
30	To determine the specific heat of solid by applying radiation of correction	Digital thermometer : Pt-100, Range -50 to +199.9 C, Resolution 0.1 C, Accuracy ± 0.2 C ± 1 digit, Battery 9V Dewar Flask : 350ml portable, 100% rust free, vacuum insulated, designed for hot & cold, copper coating provides heat retention Samples : Copper & Lead, 100gm each Steam chamber : Inner chamber 100x30mm (LxΦ), Outer chamber 80x75mm (LxΦ), Nozzle 30 x 8mm (LxΦ), Handle L=90mm, PVC.
31	To study the V-I characteristics of a Zener diode and its use as voltage regulator	one IC regulated power supply (0-12V), Digital voltmeter and Milliammeter, 02 Zener diodes (5.1V and 9.1 V), patch chords and Manua **CE & ISO Certified Product**l
32	Study of V-I and power curves of solar cells, and find maximum power point and efficiency	DC Ammeter Range: 0-200mA, DC Voltmeter Range: 0-500mV, Ammeter Display: Analog Moving Coil, Voltmeter Display: Analog Moving Coil, Solar Cell, Light Source: 100W with intensity control ,Range Selector Restive Load: 10Ω, 22Ω, 47Ω, 56Ω, 68Ω, 82Ω, 100Ω, 150Ω, 180Ω, 1KΩ **CE & ISO Certified Product**
33	To study the characteristics of a Bipolar Junction Transistor in CE configuration	All meter Should be Square size and EDM80 DC Supply :0-1V/100mA (Variable) & 0-10V/100mA (Variable) DC Voltmeter Range :0-1V & 0-10V DC Ammeter Range :0-250µA & 0-50mA Ammeter Display : Analog Moving Coil Voltmeter Display : Analog Moving Coil Transistor : NPN & PNP Interconnection :4mm patch cord**CE & ISO Certified Product**
34	To study the various biasing configurations of BJT for normal class A operation	DC supply: +12V fixed, Transistor: CL100S-3nos, Digital Voltmeter: 0-20V DC, Digital Ammeter: 0-200mA DC, Digital Ammeter: 0-200µA DC, Resistor: 1KΩ-3nos, 200KΩ-3nos, 2.2KΩ-2nos **CE & ISO Certified Product**

35	To study the frequency response of voltage gain of a RC-coupled transistor amplifier	Signal :1KHz/15mV Sine wave Transistor :BC107BP-2nos Resistor:33KΩ-2nos,330Ω-2nos,3.3KΩ-2nos,1KΩ-2nos Capacitor:100µF-3nos,10µF-2nos Interconnection:2mm patch cord Mains Power :230V/50Hz Cathode Ray Oscilloscope- 70Mhz Signal Generator – Digital LCD based **CE & ISO Certified Product**
36	**To design a Wien bridge oscillator for given frequency using a non-amp**	DC Supply: +12V & - 12V OPAMP : IC741 Resistor : 100KΩ,10KΩ Capacitor:0.01µF,0.047µF,0.1µF Mains Power :230V/50Hz
37	**To design a phase shift oscillator of given specifications using BJT.**	DC Supply:+5V BJT:CL100S Resistor:4.7KΩ-3nos,47KΩ,10KΩ,2.2KΩ,680Ω Capacitor:0.1µF-3nos,1µF,22µF Interconnection:2mm patch cord Mains Power :230V/50Hz
38	To study the Colpitt's oscillator	Biasing Voltage : +12V DC Design of Oscillators : Passive Elements with NPN Transistors Dimensions (mm) : 240 W x 345 D x 110 H Weight : 1kg (approximate)
39	Dual channel CRO	Bandwidth :70Mhz,2 GS/S Display Type: 6-inch rectangular with internal graticule 8x10div (1div=1cm). Vertical: Y-ATT SWITCH :Encoder Sensitivity:(12 step): X1 - 3% - 5mV 5V/Div Rise Time: X1 - 17.5ns - 8.75/7ns. : X5 - 50ns - 25/23ns. Input Couplig: AC, DC, GND MAX. Input Volt: 300V (DC + AC P-P)
40	Multimeter	Display : TRMS 3 ¾ Big LCD Display, DCV : 6V to 600V, ACV : 600mV to 600V, Resistance : 400 Ω to 40MΩ, Capacitance : 50nF to 100µF, Frequency : 50 Hz to 100Khz, Temperature : 0°C to 400 °C , Continuity Test , Auto Power Off
41	Study of photoelectric effect	DC SUPPLY : 0-16V, 5V/1A, DC Current : 5 Amp Display: Two separate displays (3 digits LED) for output voltage and load current continuously. RESISTANCE MODULE-Resistance : 10ohm Wattage : 10W , Connection : 4mm safety socket PHOTO DETECTOR-Detector : Silicon photocell, Terminals : 4mm, Aperture : 1 mm, Rod : 10 mm diameter Lux meter
42	Basics of GM counter characteristics and counting statistics	GM counter with Digital & Channel Analyser and Scintillation Probed and 3 type Soucres
43	Study of Gamma ray spectroscopy by SCA and	• Gamma Spectroscopy & Compton Effect Sn 1038 Universal Computer Spectrometer, Scintillation

	MCA	probe with stand, Set of 8 gamma sources, Set of 20 Absorbers, Lead Shield for radioactive sources, USB cable, manual CD Universal Computer Spectrometer, Scintillation probe with stand, Set of 8 gamma sources, Set of 20 Absorbers, Lead Shield for radioactive sources, USB cable, manual CD Universal Computer Spectrometer, Scintillation probe with stand, Set of 8 gamma sources, Set of 20 Absorbers, Lead Shield for radioactive sources, USB cable, manual CD Universal Computer Spectrometer, Scintillation probe with stand, Set of 8 gamma sources, Set of 20 Absorbers, Lead Shield for radioactive sources, USB cable, manual CD **Universal Spectrometer** ● Physical: Pulse height analysis and Multichannel Scaling modes, up to 4096-channels depending on model. ● Data Input: BNC connector multi-function input. On-board relays select internal preamplifier, shaping amplifier or direct to ADC when using external signal processing. ● Gate Input: BNC, open gate. TTL low closes gate to ADC. ● HV Output: MHV connectors. Positive output, (switched positive or negative outputs with HV option). (SHV connectors optional), 0-2048 volts, 1mA maximum current at 1000 volts. ● MCS Input: BNC connector bypasses internal preamp/ amplifier. Accepts positive TTL signal >150nsec., 5MHz maximum rate. ● ROI Output: BNC, generates pulse each time an event occurs in set region of interest. ● MSB Output: TTL output of dwell counter most-significant-bit for synchronizing Mossbauer drive. ● USB: USB type “A” connector. ● Preamplifier: Charge sensitive preamplifier for use with scintillation detectors and PMTs. ● Amplifier: Bipolar shaping amplifier with selectable peaking times of 1, 2, 4 and 8µsec. Coarse and fine gain from x1 to x160. ● Ext. Preamp: DB-9F connector supplies ±12 volts. ● ADC: Fixed conversion 10usec. Conversion gain from 256 to 4096 channels depending on model. Direct input accepts pulse peaking times of 0.5µsec. to 10µsec. ● LLD & ULD: Independently computer controlled discriminators over entire input range. ● Modes: MCA for pulse height analysis, MCS for half-life decay or other time related studies and Mossbauer mode. ● Timers: Real-time1sec. increments for PHA, or

<table>
<tr>
<td></td>
<td></td>
<td>dwell times from 10-60 msec. per channel in MCS mode. In Mossbauer mode, 100-500usec.
● Memory: Up to 4096 channels x 3 Bytes for data, plus region-of-interest flag.
● Dead time: System dead time is computed
<u>Scintillation Probe With Stand</u>
● Scintillation detector: 38x38mm2 NaI(Tl) crystal with with voltage divider.
● Resolution: 7% @ 662 keV.
● Stand: 10 position stand with sample tray
● BNC cable: BNC6 and MHV6 cable.
<u>Set of 8 Gamma Sources</u>
<table>
<tr><th>Isotope</th><th>Activity</th><th>Half-life</th><th>Emissions</th><th>Energies (keV)</th></tr>
<tr><td>Ba133</td><td>1uCi.</td><td>10.7yrs</td><td>Gamma</td><td>81.0, 276.3, 303.7, 355.9, 383.7</td></tr>
<tr><td>Cd109</td><td>1uCi.</td><td>453days</td><td>Gamma</td><td>88.0</td></tr>
<tr><td>Co57</td><td>1uCi.</td><td>270days</td><td>Gamma</td><td>122.1, 136.4</td></tr>
<tr><td>Co60</td><td>1uCi.</td><td>5.27yrs</td><td>Gamma β</td><td>1173.2, 1332.5, β317.9</td></tr>
<tr><td>Cs137</td><td>1uCi.</td><td>30.1yrs</td><td>Gamma β</td><td>32, 661.6, β511.6, β1173.2</td></tr>
<tr><td>Mn54</td><td>1uCi.</td><td>312days</td><td>Gamma β</td><td>834.8, β542.2</td></tr>
<tr><td>Na22</td><td>1uCi.</td><td>2.6yrs</td><td>Gamma</td><td>1274.5, 511</td></tr>
<tr><td>Cs/Zn</td><td>1uCi.</td><td>Mixed</td><td>"Unknown"</td><td>32, 661.6, 1115.5</td></tr>
</table>
</td>
</tr>
<tr>
<td>44</td>
<td>To determine the Planck’s constant using LEDs of at least 4 different colours</td>
<td>Selector Switch : V-I and T-I experiment
Selector Switch at V-I position :-
Voltmeter &current Display: 3½ digit, 7segment, Voltage Range : 0.000-2.000V, Current Range : 0-2000mA
Selector Switch at T-I position :-
Current Display : 3½ digit, 7segment LED
Current Range : 0-20mA
Temp Display : 3½ digit, 7segment LED
Temp Range : Room temperature to 60.0°C
Oven , Oven Connector : 5 Pin, DIN type
LED Connector : 3 Pin, DIN type
Oven with Temperature Sensor
Heating Element : 20 ohm, Oven Connector : 5 Pin, DIN</td>
</tr>
</table>

		Ambient Temp. : 60° C, Temp. Sensor : Pt100 Output Pin : Heater pin 4 & 5.,Temperature pin 1 & 2
45	To determine the value of e/m by (a) Magnetic focusing	To study charge of an electron by using Magnetic Focusing method.Kit comprises of High voltage Power Supply with intensity, focus X, Y deflection & Solenoid current controls.Two meters provided for acceleration voltage & for solenoid current controls. One 3"CRT mounted on Teak Wood Stand & a Ring Type Solenoid slides over the CRT.Dimension 11"x7"x4". (EMP-006)
46	To setup the Millikan oil drop apparatus and determine the charge of an electron.	**MILLIKAN OIL DROP APPARATUS:** Input Voltage: AC 220V, 50Hz**,** Output Power: 5W**,** Plate Voltage: 0-500V DC**,** Change over switch: Between +ve, -ve and 0 field **,** Plate Distance: 5±0.2mm**,** Total Magnification: 30X**,** Linear field of vision: =3mm**,** Scale division: 2±0.01mm**,** Objective lens: 100 lines/mm**, DIGITAL STOP WATCH:** Display: 6 Digit**,** Accuracy: 0.01sec**,** Digit size: 5mm**,** Mode: Start, Stop & Reset**,** Necklace length: 2 feet**, USB CAMERA:** Sensor: 1.2MP**,** Eyepiece: 10X with adaptor ring **,** Connectivity: USB
47	To design a switch (NOT gate) using a transistor	Data Switch : 0-5V-2nos LED Indication : LED (RED)-2nos Transistor : BC547 Resistor : 10K-2nos DC Supply :5V
48	To verify and design AND, OR, NOT and XOR gates using NAN Dgates	Bread Board Regulated DC Supply: + 5V/1 Amp. Logic Input Switches (Bounce less) - 4 Nos. LED Indicators (buffered) - 4Nos. IC7400-6nos
49	Half Adder, Full Adder and 4-bit binary Adder Half Subtractor, Full Subtractor, Adder-Subtractor using Full AdderI.C	DC Supply :+5V/250mA (Fixed) ,Data Switch : 0-5V-8nos, LED Indication : 8nos, Quad 4 IC7846 : 3nos, Quad 4 IC7404 : 2nos, Quad 4 IC7432 : 1no, Quad 4 IC7483: 1no (DSA-004)
50	To build Flip-Flop (RS, Clocked-RS, D-type and JK) circuits using NAND gates	DC Supply : +5V/250mA (Fixed) Data Switch : 0-5V-4nos , LED Indication : 2nos, Clock Pulse : High & Low Quad 4 IC7846 : 3nos, Quad 4 IC7404 : 2nos, Quad 4 IC7432 : 1no, Quad 4 IC7483: 1no (DSA-006)
51	To design an astable multivibrator of given specifications using 555Timer	DC Supply : 5V, IC : NE555, Led Indicator : 2nos Resistor : 100KΩ-2nos,10KΩ-2nos,1KΩ Capacitor :1µF,0.1µF-2nos,0.01µF-2nos,10µF Variable Resistor : 5KΩ
52	To design a monostable multivibrator of given specifications using 555 Timer	DC Supply : 5V, IC : NE555, Led Indicator : 2nos Resistor : 100KΩ-2nos,10KΩ-2nos,1KΩ Capacitor :1µF,0.1µF-2nos,0.01µF-2nos,10µF Variable Resistor : 5KΩ
53	Measurement of susceptibility of paramagnetic solution (Quinck's Tube- Method)	**POWER SUPPLY-** Voltage : 0-16V DC continuously variable & stabilized, Voltage display : 3½ digit LED, Ripple : Less than 25Mv, Overload : Current limiting

		protection, Current : 5 A continuously variable, 10% to full rating, Current display : 3½ digit LED, Working voltage : 230V AC, 50 Hz single phase, **DIGITAL GAUSS METER-** Range : 200 G & 2 kG, Resolution : 1G at 0 - 200G, Power : 220 V, 50 Hz AC, Hall probe : InAs, **TRAVELING MICROSCOPE-** Travel : Horizontal 170mm, Vertical 110mm, Least Count : 0.01mm, Working distance : 50mm, Eyepiece Ramsden : 8x, Reticle : 90° cross on glass, The vertical carriage slides on a brass pillar. In the vertical and horizontal at carriages a locking arrangement is provided to arrest coarse motion when slow motion screw is used. By successively locking and unlocking, motion in the total travers can be provided by the slow motion screw., **DIGITAL WEIGHING SCALE-** Capacity : 700g., Display :Digital, Least count : 0.1g., Body : Plastic, **ELECTROMAGNET-** Coils: 400 Turns. Coil Current: 4.5Amp (Max.), Connection: 4mm safety socket, U Core: 150x130mm (LxH), 40x40mm cross section, I Core : Length=150mm, 40x40mm cross section, Core material: Ferromagnetic
54	To measure the Magnetic susceptibility of Solids	**(a) Digital Balance-** Digital Balance Capacity: 200 gms Sensitivity:0.001gm, Hook Type Arrangement Electromagnet :Magnetic Field 20KG at 6mm airgap Energising Coils Two of approx. 13W each, Power: 0-90Vdc, 3A, for coils in series, 0-45Vdc, 6A, for coils in parallel Constant Current Power Supply, Field Intensity 11KG at 10mm air-gap with flat pole pieces Energising Coils Two, each having a resistance of about 12W, Power Requirement 0-90Vdc, 3A, if coils are connected in series 0-45V dc, 6A, if coils are connected in parallel
55	To measure the Dielectric Constant of a dielectric Materials with frequency	Capacitance Measurement from 1-50KHz Dedicated Schering Bridge with built in oscillator Computation of Dielectric Constant and loss factor Samples of Barium Titanate, MLCC & Conventional Capacitor Temperature Variation studies with additional equipments Oven & Controller
56	To determine the Hall coefficient of a semiconductor sample	**CONSTANT CURRENT SOURCE:** Current: 0-20 mA DC, Resolution: 10 micro ampere, Power: 220V ± 10%, 50 Hz AC, Display: 3 ½ digit LED, Weight: 3 Kg approx.**, POWER SUPPLY:** Voltage: 0-16V DC continuously variable & stabilized, Voltage display: 3 ½ digit LED, Ripple: Less than 25mV, Overload: Current limiting protection, Current: 5 A continuously variable, 10% to full rating , Current display: 3 ½ digit LED,, Working voltage: 230V AC, 50 Hz single phase, **DIGITAL GAUSS METER:** Range: 200 Gauss & 2 k Gauss, Resolution: 0.1 Gauss at 0-200 Gauss, Offset: By Potentiometer to et

		ZERO , Display: 3 ½ digit LED, Input voltage: 220V ± 5%, 50 Hz AC, Axial Hall Probe: InAs**, HALL EFFECT APPARATUS:** Coils: 400 Turns, Coil Current: 4.5Amp (Max.), Connection: 4mm safety socket., U Core: 150x130mm (LxH), 40x40mm cross section, I Core, Length=150mm, 40x40mm cros section, Core material: Ferromagnetic, Base dimension: 360x180x33mm, Weight: 8.8kg (approx)**, DIGITAL MULTIMETER:** Resistance: 200W, 2000, 20k, 200k & 2000k W, D.C. voltage: 200 & 2000 mV: 20, 200 & 600V, AC voltage: 200 & 600V, DC Current: 200 & 2000 mA : 20 & 200 mA : 10 A, Testing: Diode & transistor, Battery: 9V**, GE CRYSTAL PCB:** Crystal: Ge wafer, P type, Crystal size: 6x7x0.5mm (LxWxThickness), Resistivity: 1-10 ohm-cm, Orientation: <100>, Offset pot: Trim pot, Connection: 4mm safety socket
57	To draw the BH curve of Fe using solenoid and to determine the energy loss from Hysteresis	A Step-down Transformer on Board. One Solenoid Coil One Search Coil Output Brought Out Through BNC Connectors. Type Different Types of Controls Through 10 Turn Potentiometer Length of Sample 39mm, Diameter of Sample 1mm (Approx.) Sample Type:1. Soft Iron, 70 MHz Duall channel DSO with software
58	To measure the band gap of a given semiconductor by four-probe method	Four Probes Contacts : Spring loaded Space between Probes : 2 mm ±2% Probes : Collinear Sample Material : Germanium crystal Oven Maximum Temperature : Ambient to 150 °C Heater Resistance : 45O Heater Voltage : 50V AC Temperature Sensor : LM35 (0 to 150 °C) Measurement Unit Display : LCD 16 x 2 characters Measuring Parameter : Current, voltage, temperature simultaneously Constant Current Generator Current Range : 0 to 15mA (approximately) Resolution : 1mA pen Circuit Voltage : 18V Power Supply : 230V AC, 50Hz
59	To verify the law of Malus for plane polarized light	OPTICAL BENCH, - Must have Black Ionised Material : Aluminium Coating, Type : Circular section, Scale : 0-150cm, Least count : 1mm, Length :1mtr, POLARIZER / ANALYZER, Angle : Adjustable (0°-90°), Aperture : 21mm dia.Frame : 130mm dia., Rod : 10 mm dia. DETECTOR: Detector : Terminals : 4mm safety socket, Aperture : 1 mm , Rod : 10 mm diameter, Voltmeter : 0-20V
60	To determine the specific rotation of sugar solution using Polarimeter	POLARIMETER TUBE:Length :200mm with central bulb, metallic cap & cover glasses packed in a velvet case , LAURENT'S HALF SHADE: Circular scale :0˚-360˚, Least count :1˚ Vernier Reading :6 min, Dimensions : Dia 12mm, length 200mm OPTIONAL ESSENTIAL ACCESSORIES: Sodium light source ,Starting Voltage : 470 Volts, Input Voltage : 220V,50Hz,Lamp House ;

		300x85mm(Lx□), Aperture dia :25mm, Sodium Light Transformer
61	To analyze elliptically polarized Light by using a Babinets compensator	Babinet compensator setupQuarter wave plate Polariser & Analyser Eye piece & White light lamp source
64	To study the polarization of light by reflection and determine the polarizing angle for airglass interface	Goniometer Scale: Brass, dia. 150mm Objective: Achromatic lens, f = 178mm, Aperture 32mm Least count: 1 minute, Eyepiece: 10X, Gauss eyepiece Base: 190mm Triangular, Cast iron Laser Source- Diode Laser Incandescent bulb with house on stand. Reading lens: 40/50 mm diameter with handle.EMT-007
65	To verify the Stefan's law of radiation and to determine Stefan's constant.	Stefan's Constant radiation Apparatus on stand with black & silver disc Cu-Cn-Cu thermocouple on a rigid insulated board with two junctions in cotton wool.Oil bath with mustard oil, capacity 100 ml.Fuel for spirit lamp 2 x 100 ml. Spirit lamp on adjustable stand.Cotton wool in a cylindrical copper enclosure on the stand for junctions of cu-cn thermocouple. water bath copper, Super sensitive micrometer as galvanometer fixed on board. Steam boiler2 liter. Capacity with plastic tubing with pinch cock. Hot plate thermostatic controlled single phase (8").Two mercury thermometer 110 ' C for black body appt.One mercury thermometer 360 ' C for oil both.One 250 ml glass beaker , one plastic funnel.Two spiral connecting wires with connectors.Steam boiler2 liter. Capacity with plastic tubing with pinch cock.Hot plate thermostatic controlled single phase (8").Two mercury thermometer 110 ' C for black body appt. One mercury thermometer 360 ' C for oil both.One 250 ml glass beaker , one plastic funnel.Two spiral connecting wires with connectors
66	To determine the Boltzmann constant using V-I characteristics of PN junction Diode.	**P-N JUNCTION SETUP**: Selector Switch : V-I and V-T experiment, Bias & Junction, **Selector Switch at V-I position/Junction:** Voltmeter Display :3½ digit, 7segment LED, auto polarity, Voltage Range : 0.000-1.999V, Current Display : 3½ digit, 7segment LED, Current Range : 0-20mA, **Selector Switch at V-T position/ Junction :-** Voltage Display : 3½ digit, 7segment LED, Voltage Range : 0.000-1.999V, Temperature Display : 3½ digit, 7segment LED, Temperature Range : 273K to 353KVoltage : 220mV (p-p), **CRO in Bias Position :-**Frequency : 5KHz & 20KHz, Voltage : 220mV (p-p), Output Connector : 3 Pin, DIN type, Voltage Range : 0.00-10.00V, Oven : Heater pin 4 & 5. Temperature pin 1 & 2, Oven Connector : 5 Pin, DIN type, Diode & Transistor : 4mm safety socket, Input Voltage : 220V, 50Hz AC, **OVEN WITH TEMPERATURE SENSOR**: Heating Element : 35 ohm, Oven Connector : 5 Pin, DIN type, Ambient Temperature : 353K, Temperature Sensor : Pt100, Output Pin : Heater pin 4 & 5. Temperature pin 1 & 2, **JUNCTION**

		TRANSISTOR: Transistor : NPN, Type : BC109, Connector : 4mm Plug-in Socket, **DIODE**: Diode : P-N Junction, Type : IN5402
69	Determination of e/m by magnetic focus sung	To study charge of an electron by using Magnetic Focusing method.Kit comprises of High voltage Power Supply with intensity, focus X, Y deflection & Solenoid current controls.Two meters provided for acceleration voltage & for solenoid current controls. One 3"CRT mounted on Teak Wood Stand & a Ring Type Solenoid slides over the CRT.Dimension 11"x7"x4".
	Study of photo-electric effect.	DC SUPPLY : 0-16V, 5V/1A, DC Current : 5 Amp Display: Two separate displays (3 digits LED) for output voltage and load current continuously. RESISTANCE MODULE-Resistance : 10ohm Wattage : 10W , Connection : 4mm safety socket PHOTO DETECTOR-Detector : Silicon photocell, Terminals : 4mm, Aperture : 1 mm, Rod : 10 mm diameter
70	Study of diffraction pattern of single and double slits using laser source and determination of its wavelength	**OPTICAL BENCH-** Material: Black Aluminum alloy, Type: Hexagonal section, Scale: 0-100cm, Least count: 1mm, **DIODE LASER-** Peak wavelength: 635nm, Operating voltage: 5V DC, Operating current: 250mA, Optical power: 0.40-0.8mW, Laser product: Class II, Operating temp. : 0-40°C, Storage temp. : -10 to 50 °C, **PIN HOLE PHOTO DETECTOR-** Detector: Silicon photocell, Terminals: 4mm safety socket, Aperture: 1mm, Rod: 10mm diameter, **SLIT HOLDER-** Clear Aperture: 45x45mm, Object holder: Clip type, Mounting Rod: 10mm diameter, **SADDLE WITH MICROMETER-** Material: Aluminium, Transverse Motion: 10-0-10mm, Least count: 0.02mm, Locking: Spring loaded, Motion: X-Y axis, Holder: 10mm dia, **SINGLE WIRE-** Frame Size: 50mm x 50mm, Clear aperture: 15mm dia. (approx.), Wire thickness: 0.5mm (approx.), **CROSS WIRE-** Frame Size: 50mm x 50mm, Clear aperture: 15mm dia. (approx.), Wire thickness: 0.5mm (approx.), **TRANSVERSE SADDLE-** Material: Aluminium, Locking: Spring loaded, Motion: X-Y axis, Holder: 10mm dia, **DIGITAL MULTIMETER-** Resistance: 200W, 2000W, 20k, 200k & 2000k W., D.C. Voltage: 200 & 2000, mV: 20, 200 & 600V, AC Voltage: 200 & 600V, D.C. Current: 200 & 2000mA, 10A, Testing: Diode & transistor, Battery: 9V, **DIFFRACTION SLIDE-** Frame Size: 50mm x 50mm, Slit: Width=0.06mm & Separation=0.20mm (Single, Double), Diffraction grating: 80 lines /mm, Diffraction grating: 300 lines /mm, Single slit: Tapered, Double slit: Tapered, Metal gauze: 300 mesh, All individually mounted in slide frames and protected by two Glass plates
72	Fabry Perot interferometer Polarization Experiments Babinet compensator EdsarButlerbands Quarter	**OPTICAL BENCH-** Material: Black Aluminum alloy, Type: Hexagonal section, Scale: 0-100cm, Least count: 1mm, **DIODE LASER-** Peak wavelength: 635nm, Operating voltage: 5V DC, Operating current: 250mA,

	wave plate Mallus Law Study of elliptical polarized light	Optical power: 0.40-0.8mW, Laser product: Class II, Operating temp. : 0-40°C, Storage temp. : -10 to 50 °C, **PIN HOLE PHOTO DETECTOR-** Detector: Silicon photocell, Terminals: 4mm safety socket, Aperture: 1mm, Rod: 10mm diameter, **SLIT HOLDER-** Clear Aperture: 45x45mm, Object holder: Clip type, Mounting Rod: 10mm diameter, **SADDLE WITH MICROMETER-** Material: Aluminium, Transverse Motion: 10-0-10mm, Least count: 0.02mm, Locking: Spring loaded, Motion: X-Y axis, Holder: 10mm dia, Fabry parot Etalon
73	Constant Deviation Spectrography Calibration Zeeman effect	Study of Zeeman effect: with external magnetic field; Hyperfine splitting <u>Technical Specification</u> POWER SUPPLY 0-30V DC, 10A Input Voltage : AC 220V ±5%, Output Voltage : 0-30V Output Current : 0-10Amp, Voltage & Current Display : 3½ LED ELCTROMAGNET Coils : 400 turns., Coil Current : 10 Amp (Max.) U Core : 150x130mm(LxH), 40x40mm cross section. I Core : Length=150mm, 40x40mm cross section. Core material : Ferromagnetic. OPTICAL BENCH-Material : Aluminium alloy, Type : Hexagonal section ● Scale : 0-100cm, Least count : 1mm SK - 075 FABRY PEROT ETALON ● Mirror optics :Lamda/20, Mirror gap : 3 mm, adjustable ● Filter : 532nm, Green, Interference Filter, Clear view : 40mm dia ● Rod : 10 mm dia CCD CAMERA ● Sensor : CMOS, Output : VGA, Connector : BNC ● Power : 5V DC, Focus : Manual adjustment, Rod : 10 mm dia. POLARIZER FILTER ● Angle : Adjustable (0°-90°), Aperture : 21mm dia. ● Frame : 130mm dia, Polarization : Linearly , Rod : 10 mm dia. QUARTER WAVE PLATE ● Angle : Adjustable (0°-90°), Aperture : 15mm dia. Frame : 130mm dia., Polarization : Circular , Rod : 10mm dia.
74	Babinet Quartz Spectrography	Babinet Compensator Quarter wave plate Polariser Analyser Eye pieceEMT-003 White light lamp source

DEPARTMENT OF COMMERCE

SL#	Name of the Equipment	Product Specification
01	All in one Desktop Computer	Windows 11 Home. Intel core3 /100U /8GB /512GB SSD/ wireless keyboard & Mouse
02	All in one laser Printer	Print/Scan/ Copy
03	Inverter & Battery combo (2 No150 Ah tabular battery)	
04	UPS for Desktop Computer & Smart Board	
05	Keyboard (USB) for Desktop Computer	
06	Mouse (USB) for Desktop Computer	

ANNEXURE-II

SAMPLE PROFORMA FOR FINANCIAL BID

To

The Principal,
M.P.C. Autonomous College
Takhatpur, Baripada, Mayurbhanj- 757003

Ref: Bid no. ..... Dated .....

Sir,

I / We _____ hereby offer to supply, install and commission of the following item(s) at the prices indicated below:

Department of _____					
Sl. No.	**Name of the Equipment / Instrument**	**Specifications**	**Whether the specification matches the required specification as per Annexure-I (Yes / No)**	**Make**	**Unit Price (Inclusive of GST)**

Further, it is certified that I/ we have understood the general Terms and Conditions of the bid and our offer is to supply items strictly in accordance with the requirements and the terms mentioned in the bid.

Note: No change in the Performa is permissible.

Date:

Place: (Signature and seal of the bidder)

Note: The Bidder must submit separate Financial Bid for each department.

ANNEXURE- III

DETAILS OF THE TENDERER

Sl. No	Particular	
1	Name of the Firm/Agency/Company	
2	Complete postal address	
3	Telephone Number & e-mail Id	
4	Name of Authorized Signatory (in block letters)	
5	Contact No. of authorized signatory	
6	Type of /Firm (Proprietary/ Partnership/ Pvt. Ltd./Public Ltd) Tenderer has to provide relevant documents as a proof of firm type	
7	Date of Establishment and Experience in business (In number of years).	
8	G.S.T. Registration No.	
9	PAN No.	

Note: The bidder must submit supporting documents in respect of the above claim along with the bid document.

Date:

Place: **Signature & Seal of the Bidder**

ANNEXURE-IV

SELF DECLARATION FOR NOT BLACK LISTED

To

The Principal,
M.P.C. Autonomous College
Takhatpur, Baripada, Mayurbhanj, Odisha - 757003

Ref. Tender No……dated…….

Sir/Madam,

I/We ……..hereby confirm that our firm has not been banned or blacklisted by any Government Organization/ Financial institution/ Court/ Public/ sector unit/ Central Government.

Date:……..

Place: …….

(Signature and seal of the bidder)

ANNEXURE-V

DECLARATION

To

The Principal,
M.P.C. Autonomous College
Takhatpur, Baripada, Mayurbhanj, Odisha - 757003

Ref. Tender No……dated……..

Sir/Madam,

I/We ……..hereby declare that my/our firm will complete the work in time and submit the vouchers for payment within 15 days from the date of issue of work order.

Date:……..….

Place: …….

(Signature and seal of the bidder)