



Government of West Bengal  
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## **TENDER NOTICE** **Dept of Physics**

Sealed Tenders are invited by the undersigned for purchase of the listed articles by the Department of Physics of the College as required during the session 2016 – 2017. Purchased will be controlled by the following conditions:

1. VAT No., WBST No., PAN No.
2. Supply of the articles must be registered by authorized stockiest/agents or manufacturer at usual terms and conditions of payments in Govt. Offices.
3. The Tenders should indicate clearly the quality, name of the manufacturer, details specifications of each item along with rate/discount offered.
4. Terms and conditions for purchase may be done on the basis of Rate Contract wherever applicable.
5. Printed catalogues, Literatures and Current Price List should be sent.
6. Cover of the Tender should be superscripted “For **Physics Department**”.
7. The department reserves the right to accept, reject any Tender in part or full without assigning any reason.
8. Tender may be submitted within nine days from the date of Publication of this Notice. Tenders will remain valid up to 31<sup>st</sup> March, 2017.
9. Date of opening of the sealed Covers will be displayed on the Departmental Notice Board. Tenderers may be present if they so like.

**Last date for submission of Tender is 26<sup>th</sup> July, 2016 before 4.30 p.m. at the said office.**

Sd/-  
Officer-in-Charge  
Government General Degree College at Ranibandh

### **List of Tender items 2016-17**

#### **EQUIPMENTS:-**

##### **A. General:**

1. Digital Balance. (Capacity 100-200 mg, sensitivity: 1 mg / 10 mg) (Make: INCO or equivalent)
2. Pullinger's apparatus.
3. Fortins's Barometer.
4. Moment of inertia apparatus with two bars.(One with rectangular cross section and other with circular cross section). (Make: INCO or equivalent)

5. Apparatus for determination of Rigidity Modulus by dynamical method. (Make: INCO or equivalent)
6. Young's Modulus apparatus by Searle's method. (Make: INCO or equivalent)
7. Stop watch. (Make: Racer)
8. Stop clock. (Make: INCO)
9. Apparatus for determination of the surface tension by Jaeger's Method & study of its variation with temperature. (Make: INCO or equivalent)
10. Rubber tube (to withstand high temperature) 7mm, 10mm, 12mm inner diameter.
11. Traveling microscope (Two position, Three position) (Make: INCO/ SES).
12. Stokes law apparatus. (Make: INCO or equivalent)
13. Heating Mental (With regulator) (1 liter capacity) (Make: EI or equivalent)
14. (i). Bar pendulum (ii) Kater's Pendulum. (Make: INCO or equivalent)
15. Cathetometer (for Flexure of beam) (Make: INCO or equivalent)
16. Young's Modulus (by Flexure of beam) (Brass / steel bar preferable)
17. Viscosity by Poiseuilles' Method. (Make: INCO or equivalent)
18. Spirit Level.
19. Copper water bath for Jeager's Appts.( with Stirrer) (Make : INCO)
20. Pinch Cock
21. Pressure head (Poiseuille's Expt.)
22. Lee's and chartton's apparatus. (Make: INCO or equivalent)
23. Cross wire and eye piece
24. Rubber Cork
25. Magnetometer (vibration and deflection type)
26. Screw gauge
27. Slide calipers
28. Bar Magnet. (2 inch)
29. Thermometer. (1/10, 1/2, 1 degree)
30. Complete set for determination of Linear expansion coefficient by travelling microscope method (with and without travelling microscope) (Make: INCO or equivalent)
31. Tuning fork set (Eight/Six different frequency)
32. Refrigerator (LG/ Samsung/Videocon/Godrej 165/300 lt.)
33. Apparatus for determining the (i) spring constant (ii) g and (iii) modulus of rigidity of a vertical spiral spring. (Make: INCO or equivalent)
34. Apparatus for determining Moment of Inertia if a fly-wheel.
35. To measure the value of Young's Modulus for a wire by optical lever method. (Make: INCO or equivalent)
36. Apparatus for determining the coefficient of thermal conductivity of copper by Searle's method.
37. Apparatus for determining the coefficient of thermal conductivity of copper by Angstrom's method.
38. Apparatus for determining the variation of Thermo-EMF of Thermo-couple using the temperature difference of two junctions.
39. Apparatus for calibrating a thermo-couple to measure temperature in a specific range using (i) Null method (ii) direct measurement using OpAmp different amplifier and to determine neutral temperature.
40. Apparatus for Newton's Law of cooling.

## **B. Electrical:**

1. Mica Capacitor Box (0.1 mfd – 5mfd; 0.001mfd – 10mfd; 0.11mfd – 10 mfd) (Make: Set & De or equivalent)
2. Ceramic capacitor box, 0.11, 0.22,0.33, 0.47,0 .56, 1.0, 2.2, 4.7 microfarad
3. Mutual inductance coil
4. Fractional Resistance Box of all possible combination. (Make: Set & De or equivalent)
5. Carrey foster bridge apparatus (Make: INCO/Set & De )
6. Meter bridge apparatus (Make: INCO/Set & De )

7. Table Galvanometer (Make: Set & De )
8. DC Milli-ammeter (0-5mA, 0-100mA, 0-200mA). (Digital/Analog) (Make: INCO/Set & De )
9. Jockey for meter bridge (Make: INCO/Set & De )
10. Variac (2 amp or 8 amp current, input 230 volt, output 260 volt.) (Make: Set and De or equivalent)
11. Compact set for investigation of a series L-C-R circuit with A.C. voltmeter arrangement. (Make: Rel or equivalent)
12. Standard solenoid (6 amp, 4amp, primary turns: 200, 500, 700, Secondary turns: 1000, 1200, 1500, 2000 turns). (Make: Set and De or equivalent).
13. Line voltage stabilizer.
14. Pressure coefficient apparatus. (Constant volume) (Make: Set and De or equivalent)
15. Ballistic Galvanometer (Time period –14/12 sec. C.D.R. 10000  $\Omega$ , coil resistance 200  $\Omega$ , D type). (Make: Set and De or equivalent)
16. De'Arsonval's Galvanometer Dead beat type (sensitive) resistance- 100 $\Omega$ , 200  $\Omega$ .
17. Mega ohm resistances (single, accurate and each sealed in a box 20, 30, 40, 50 M $\Omega$ ).
18. Mega ohm resistance box. (Make: Set & De or equivalent)
19. Resistance Box (0 – 500 $\Omega$ , 0 – 5000  $\Omega$  & 0 – 10000  $\Omega$ ). (Make: Set & De or equivalent)
20. P.O.Box. (Make: Set & De or equivalent)
21. Supporting wooden cabinets for D.C.meters of dia 16.5 c.m. & approx depth 10c.m.
22. Copper boiler 2.5 litre.
23. Hypsometer 2 litre.
24. Platinum resistance thermometer.
25. High voltage power supply (30volt variable, 5Amp). (Make: Set & De or equivalent)
26. 8 pin power plug for CRT of e/m set.
27. Regulated power supply -2v, 4v, 6v, 8v, 10v, 12v and current capacity 3 amp in compact set. (Make: REL or equivalent)
28. A.C. electronic voltmeter/ mili voltmeter (1 – 300 mv & 1 – 300 v). (Make: SES or equivalent)
29. Multimeter. (Make: Metravi; Model 451)
- 30 Flexible connecting wire (single core with different colour) for connection in the bread board.
- 31 Constantan wire.
- 32 Dual polarity regulated power supply (for op-amp) (i)  $\pm 15$ volt. (ii)  $\pm 12$ volt.
- 33 Single polarity regulated power supply - 5volt, 9volt, 2volt (current 1 amp)
- 34 Copper plate for Copper Voltmeter size-12c.m. $\times$ 6c.m. $\times$ 0.3c.m.
- 35 Copper voltmeter (built in glass) fitted with two anode plates and a cathode plate with a dummy cathode size-12c.m. $\times$ 6c.m. $\times$ 0.3c.m.
- 36 Fuse for power supply with different amps.
- 37 Single core wire (Hook up wire) -5 multi colour
- 38 Connecting wire for electrical circuit (22swg)
- 39 Apparatus for Determination of boiling point of a liquid (Aniline)
- 40 Apparatus for Determination of melting point of a solid with the help of thermocouple
- 41 300 Lt. compressor for refrigerator.(Godrej)
- 42 DC Voltmeter (0-2v,0-10v).
- 43 DC Mill voltmeter (With different ranges). (Make: Set & De or equivalent)
- 44 Dc Ammeter (With different ranges). (Make: Set & De or equivalent)
- 45 Theven's Norton's kit. (Make: REL or equivalent)
- 46 Boiler / Induction heater with stainless steel boiler (Make: REL or equivalent)
- 47 Electrolytic Capacitor (1micro farad to 100 micro farad)
- 48 Bulb for overhead projector. (Phillips)
- 49 Digital Gauss mater ( Make: Set & De or equivalent)
- 50 Shunt resistance box (Make: Set & De or equivalent)
- 51 Clamp & stand (Make: REL or equivalent)
- 52 Pohls Commutator.
- 53 Complete set for B- H loop. (Make: Set & De or equivalent)

- 54 Connecting wire with single side and both side prob.
- 55 Charge and discharge key. (Make : INCO or Equivalent)
- 56 (i). Anderson's Bridge (Complete Set up) (Make: REL or equivalent)  
(ii). De'Sauty's Bridge (Complete Set up) (Make: REL or equivalent)
- 57 Null detector for Anderson bridge (AC & DC detector with AC & DC source)
- 58 Rheostat- 0-3.5A (Make: Set & De or equivalent)
- 59 Apparatus for determination of Temp. Coefficient. of resistance –Full set (Make: REL or equivalent)
- 60 Determination of excitation potential Frank- hertz experiment. (Make: SES or equivalent)
- 61 Determination of e/m ratio for electron by using a cathode ray tube and a pair of bar magnets. (Make : INCO or equivalent) (with Specification sheet)
- 62 Apparatus for the study of Response curves for series and parallel L-R, R-C, L-C-R circuit. (Make: REL or equivalent)
- 63 Ballistic galvanometer constant by standard solenoid method (complete set) (Make: Set & De or equivalent)
- 64 Determination of specific heat of water by Calendar and Barnes method (complete set) (Make: INCO or equivalent)
- 65 One/Two/Three way key (Make: INCO or equivalent)
- 66 Copper – Constantan thermocouple (length = 1 meter; suitable for thermocouple expt.)
- 67 Apparatus for determining the field strength B and its variation in a solenoid (dB/dx) (Make: INCO or equivalent)
- 68 Apparatus for determining of a self inductance of a coil by Rayleigh's method.

### C. Optical:

1. Grating (Glass & Original)– 100, 200, 300, 600 lines per cm
2. Discharge tube:- Hydrogen, Helium, Mercury, Neon, Argon.
3. Power supply for Discharge tube. (Make: PLASMA or equivalent)
4. Lamp and scale stand. (Make: INCO or equivalent)
5. Discharge tube stand. (Make: INCO or equivalent)
6. Spectrometer (7 inch) scale dia 10", V.C. 20 sec., m.s.d. =  $\left(\frac{1}{3}\right)^\circ$  (Make: INCO or equivalent)
7. Sodium Vapour lamp 35w, 55w.
8. Transformer for sodium vapour lamp. (35W /55W /150w) (Make: REL or equivalent)
9. Lamp House for sodium vapour lamp. (Make: REL or equivalent)
10. Plate and lens arrangement of Newton's ring. (Make: INCO or equivalent)
11. Prism. (EDF)
12. Rectangular glass mirror piece for single slit experiment.
13. Newton's Rings a Mercury Lamp Apparatus (Complete set). (Make: INCO or equivalent)
14. Convex lens (with different focal length)
15. Concave lens (with different focal length)
16. Determination of refractive index of the material of lens and liquid by lens mirror method. (complete set)
17. Study of Diffraction pattern due to a thin wire by using a laser source.
18. Single slit (Make : INCO or equivalent)
19. Single slit to be fitted with colli meter tube. (dia 5.5 cm, 3.2 cm)
20. Double Slit.
21. Polarimeter tube. (Length 20 cm, volume 25 cc) (Make: Quality or equivalent)
22. Fresnel's Biprism experiment. (complete set) (Make: INCO or equivalent)
23. Polarimeter Experiment (Bi-quartz) (complete set) (Maker: INCO or equivalent)
24. Polarizer and analyzer for Fresnel's equation experiment. (dia 5.5 cm, 3.2 cm) (Make: INCO or equivalent)
25. Polaroid for polarimeter Expt. (Bi-quartz)
26. Mercury Lamp.

27. Transformer for Mercury Lamp.
28. Bulb for lamp and scale (6 volt/12 volt; 6 watt/15 watt; single pin/double pin)

#### **D. Electronics:**

1. Zener diode (4.7, 5.6, 6.2 volt)
2. P-N junction diode characteristics and a fixed resistance in parallel kit. (Make : Gargi enterprise or equivalent)
3. Triode characteristics (both dynamic and static ) apparatus with power supply 0-300 V, 120 mA current.
4. Transistor output characteristics in CE mode apparatus with regulated power supply. (Make : Gargi enterprise or equivalent)
5. Regulated power supply- a) 0-10 volt (variable) b) 0-15 volt (variable)
6. Zener diode characteristics kit. (Make : REL or equivalent)
7. Zener diode characteristics study board fitted with center tap transformer. (Make : REL or equivalent)
8. OP-Amp board. (Make: REL or equivalent)
9. BNC Probe for CRO.
10. Compact Set for study of Frequency response curve of CE amplifier with different load. (Using NPN with large bandwidth From 1KHz to 100KHz) (Make: REL or equivalent)
11. Diode BY 125, BY 127, IN 4148, IN4007
12. Compact set for drawing Transistor characteristics in CE mode (fitted with bread board additionally) . (Make : REL or equivalent)
13. Determination of Band-gap of Thermistor/Semiconductor Devices (with temperature controller and with Voltmeter & Ammeter). (Make: REL or equivalent)
14. Hybrid Parameter Board. (Make: REL or equivalent)
15. Fourier spectrum Board. (Make: REL or equivalent)
16. Wein's Bridge Board. (Make: REL or equivalent)
17. Function Generator up to 1MHz. (Make: SES/Metravi)
18. Audio Oscillator. (1Hz-100KHz). (Make: Scientific)
19. Storage Oscilloscope (Dual trace) 20MHz. (Make: Metravi or equivalent)
20. Rectifier Bridge, also center tap, transformer with L type,  $\pi$  type or without filter & bread board provisions additionally. (fitted with variac for a.c. input variation). (Make: REL or equivalent)
21. Power supply for zener diode expt. (0 – 10 v, 500mA) (Make: REL or equivalent)
22. Calculator (Casio fx 100).
23. Logic circuit trainer board (NOT, AND, OR logic using NAND) (Make: REL or equivalent)
24. IC Chip—741,7400,7474,74121,4046, 7486, 7491,7402,7409,7408,7476,7432, AD 844
25. Transistor—2N2222, 2N2907, 157, 147, CL/SL 100, CK 100
26. Discrete resistance component (All possible colour code resistance from 10 ohm to 820 Kilo ohm)
27. Discrete capacitance: ( All possible values from 1 pF to 0.68  $\mu$ F)
28. Discrete inductance: 8, 10, 15, 18, 20, 22, 33, 38, 42, 50 mH
29. Bread Board.
30. Carbon potentiometer (1 K $\Omega$ , 10 K $\Omega$ , 100 K $\Omega$ )
31. Digital storage oscilloscope (3MHz)- (Make: Tetronics or equivalent)

#### **E. Chemical and Glassware:**

1. Beaker (Borosil)- 50ml, 100ml, 250ml, 500ml, 1000ml.etc.
2. Measuring Cylinder (Borosil) - 50cc, 100cc, 150cc, 250cc etc.
3. Glass trough. (Borosil) diameter – 26cm, depth – 12cm.
4. Viscosity tube (Borosil) - (1.5mm/2mm/2.5mm dia).
5. Glass cylinder for Stokes law apparatus. (5 cm dia) (Borosil)
6. Wolf's bottle for Jaeger's apparatus (Borosil)

7. Copper sulphate. (EMARC)
8. Castor oil. (EMARC)
9. Aniline. (EMARC)
10. Ammonium chloride. (EMARC)
11. Naphthalene (Bengal Chemicals).
12. Mercury. (EMARC)
13. Sucrose. (EMARC)
14. Specific Gravity Bottle (Borosil)
15. Nife cell solution.
16. Porous pot (For Leclanche's Cell)
17. Glycerin (EMARC)
18. Methylated Spirit (EMARC)
19. Ether. (EMARC)
20. Distilled Water
21. Funnel-(Borosil)-25cc, 50cc, 100cc, 250cc, 500cc, 1000cc.
22. Capillary Tube (.5mm,1mm,1.5mm, 2mm dia.)
23. Separating funnel-(Globe shape)-Different size (Borosil)
24. Round bottom Flask with long neck and std. joint at the end - Different size (Borosil)
25. Round bottom Flask with B24 std. joint. (Borosil)
26. Adapter B24
27. Glucose

### **Contingency goods: -**

1. Dry cell for use with multimeter (i) Eveready-935type (ii)9v type(model No.-216type) (iii)Pencil type (Nippo Gold. (iv) 6v
2. Bulb-40w, 60w, 100w.
3. Banana Plug.
4. Button cell for calculator.
5. Band-Aid.
6. Cover file
7. White chalk (Dust less) "Kores" make.
8. Dendrite.
9. Dettol.
10. Fevisticks .
11. Lock (navtal or others) 5 liver & 7 liver.
12. Paper-A4 size (hand craft paper), U-1 size.
13. Phenyl.
14. Pen
15. Refill (red & blue).
16. Soap.
17. Towel.
18. Two pin top & three pin top (best quality).
19. Graph paper (m.m. scale)./Sime log Graph paper
20. Key case.
21. Collin
22. Steel Ball (Six different type dia.)
23. Cloth Duster
24. Extension cord -15 amp.
25. Heater coil
26. White board
27. Wooden electrical board.
28. Tefflon Tape.
29. Stove.