



COOCH BEHAR PANCHANAN BARMA UNIVERSITY

Vivekananda Street, Cooch Behar-736101

Ph.: 03582-230218

E-mail :- info@cbpbu.ac.in

Website:- www.cbpbu.ac.in

Ref. F27.V4/REG/971-18

Date: 21.07.2018

TENDER INVITED FOR PHYSICS LABORATORY EQUIPMENT

Tender document can be downloaded from the University's website www.cbpbu.ac.in and in such a case the bidder shall deposit the cost of tender documents along with submission of the tender, failing which his tender shall not be opened. The tender form complete in all respect should reach the Registrar, Cooch Behar Panchanan Barma University, Vivekananda Street, Cooch Behar – 736101, West Bengal, India, in duly sealed envelope super scribed with "**Physics Laboratory Equipment**" up to 2.30 p.m on 02.08.2018. The tender will be opened on the same day at 3.30 p .m by a committee in presence of tenderer who may wish to be present. The Registrar Cooch Behar Panchanan Barma University reserves the right to accept or reject any or all the Tenders without assigning any reason. Incomplete & conditional tenders are liable to be rejected.

Demand Draft/Pay Order of Rs. 2000/- (Two thousand only) drawn in favour of Cooch Behar Panchanan Barma University Payable at Cooch Behar, as cost of Tender Document.

Demand Draft/Pay Order of Rs. 30,000/- (Thirty thousand only) drawn in favour of Cooch Behar Panchanan Barma University Payable at Cooch Behar, as earnest money.

Physics Laboratory (Sem -III)

Sl. No	Name of the Experiments	No. of Qty
1.	Zeeman Effect Experiment, ZEX-01 Complete in all respect including 14" monitor and CCD Camera	1
2.	Determination of Dielectric Constant of Liquids, Model DCL-01	1
3.	GEIGER COUNTING SYSTEM (Microcontroller based) (Research Model) GC 602A ESSENTIAL ACCESSORIES FOR G.M. SYSTEM: 1" wide end window GM detector (GM 125) Sliding Bench with detector holder and source holder for GM125 Detector (SB207) Radioactive Source Kit (One Gamma Source i.e.Cs-137 & One Beta Source i.e.Tl-204)(SK 21 0) ADDITIONAL ACCESSORIES TO CARRYOUT THE FOLLOWING EXPERIMENTS : Aluminum Absorber Set (For beta particle range & maximum energy determination Experiment) Aluminum absorber set	1 1 1 1





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	AA270 Detector holder, absorber holder & lead block (For back scattering of Beta particles experiment) (Without detector) AS272 OPTIONAL ACCESSORIES Data Communication software CD & RS 232 Cable (For downloading data into PC)	
4.	Hall Effect Experiment, HEX-21 The apparatus consists of: a) (i) Hall Probe (Ge Crystal-n type), HPN-21 (ii) Hall Probe (Ge Crystal-p type), HPP-21 b) Multipurpose Stand, HPS-21 c) Hall Effect Set-up, Model DHE-21 d) Electromagnet, Model EMU-50V e) Constant Current Power Supply, Model: DPS-50 f) Digital Gaussmeter, Model DGM-102 Complete in all respect	<u>1</u> 1 1 1 1 1 1
5.	Resistivity of Semiconductors by Four Probe Method at Different Temperatures and Determination of the Band-gap, Model DFP-03 Complete in all respect	1

Physics Electronics Laboratory (1st and 4th semester)

Sl. No	Name of the Experiments	No. of Qty
1.	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	1
2.	To design and construct constant – K type (a) low pass (b) high pass (c) band pass filters (using π section) and to study the variation of attenuation and phase constants of these filters with input frequency. To determine the cut off frequencies and to compare with theoretical values	1
3.	To study the variation of output voltage with frequency and load resistance for a given class-B Push Pull amplifier and to obtain the variation of output power with frequency and load resistance.	1





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4.	Trainer kit for designing of Clipping & Clamping Circuit using Diode with Model circuit diagram printed on board with necessary terminals and Diodes Resistances and switches. A bread Board will also be provided on the board to construct the circuit.	2
5.	To design an astable multivibrator using BJT: & Op – Amp :Complete set consists of two Transistors, Resistors and Capacitors. One Model circuit diagram is provided on board with 5 Volt Power Supply and one ± 12 Volt Supply for using Op – Amp as astableMultivibrator. Complete unit encased in an elegant metal cabinet with printed circuit diagram and one Bread Board will be provided on board for designing and fabricating the circuit with external circuit components by the students.	2
6.	Uni-junction Transistor Characteristic Apparatus: The Apparatus consists one two variable Power Supply to control the emitter – base voltage VBE & VBB in suitable range. Three Digital meters of $3\frac{1}{2}$ Digit 7 segment LED display two suitable range of volt meter for measuring VBE & VBB are provided on the panel and one current meter of suitable range for measuring collector current in mA order. An UJT is fitted on the panel with necessary terminals and potentiometer. One Bread board will be provided on the panel of the experiment kit to design with spare of UNT using arbitrary Function Generator for observing Peak Voltage and Valley Voltage with the help of CRO.	2
7	Trainer kit for Emitter follower: C – C mode Emitter follower with printed circuit diagram and necessary terminals and components with one CL – 100 Transistor fitted on board. One + 12 Volt DC power supply with respect to ground will be provided on board with one variable Load resistance. A Bread Board will also be provided on board for external connection. Complete set without Oscillator & CRO.	1
8.	To construct using OPAMP, (i) Differentiator (ii) Integrator (iii) adder-subtractor circuits. To study their performance for different time varying inputs	2
9.	To determine CMRR, input offset voltage, output offset voltage, input bias current and slew rate of an OP- AMP.	1
10.	To study OP-AMP as voltage comparator. Plot a curve in input and output voltages and show how the output switches from positive to negative value	1
11.	To design and construct a Wein-Bridge oscillator using OPAMP and to study its output waveform and frequency for various RC values	1
12.	To study OP-AMP as a function generator, i.e. as (a). square	1





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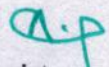
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	wave generator (b). triangular wave generator	
13.	To construct Half-Adder and Full-Adder circuits using logic gates and to perform some simple 2's complement Adder-Subtractor operations (Two decimal digits).	1
14.	To construct Half-Adder and Full-Adder circuits using logic gates and to perform some simple 2's complement Adder-Subtractor operations (Two decimal digits). Complete set consists of +5V Power supply with eight Input and eight output Logic signals and clock Pulse Oscillator and eight bouncer and de-bouncer switches. A bread board is fitted on the centre of the trainer kit with basic logic gates.	1
15.	a) To construct X-OR gate using NAND gates and to verify truth table. (b) To convert two input NAND gate to two input OR gate. (c) To construct NOR gate by using other gates and hence verify the truth table.	2
16.	AC milli-voltmeter ACM 102(SES)	2
17.	Function Generator 3Hz to 3MHz Microcontroller base Sine, Square & Triangular	1
18.	Function Generator 10Hz to 100KHz Microcontroller base sine, square & Triangular with Shaw tooth Generator	2
19.	Discrete components & connecting wires for electronics lab (Please see annexure I)	
20.	Multimeter (Make: reputed)	3
21.	Breadboard for electronic lab 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, Flatness 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.	25
22.	Over head projector with screen Make: any reputed brand	1


Registrar

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Annexure I

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
xxi)	Power supply Power supply (5V)	3
xxii)	Power supply (12V)	3
xxiii)	Transistor CL 100	100
xxiv)	Capacitor -0.1 μ f	100
xxiv)	Capacitor -0.001 μ f	100
xxv)	Capacitor -0.01 μ f	100
xxvi)	Resistance Pot (1M Ω)	20
xxvii)	Resistance Pot(47K)	20
xxviii)	Resistance Pot(10K)	20
xxix)	Resistance Pot(100K)	20
xxx)	Resistance Pot(1K)	20
xxxi)	Connecting copper wire	2 coil
xxxii)	Connecting wire for breadblards	100 mt
xxxiii)	Fibre optic cable; Suitable for fibre optic kit experiments, 1 mts length	5 pc
xxxiv)	Wooden Extension cord Make: 5 pin sochet, switch-3, fuse-1, Indicator-1 and 5 meter of wire per board	5

