Department of Physics
A B N Seal College, Coochbehar

List of Equipment/Instruments to be purchased in the Department of Physics from the fund received (Ref.: Officer Order dated 02.08.2019 of A B N Seal College, Cooch Behar) for Purchase of Furniture, Equipment, Computer & peripherals, CCTV etc. from the Department of Higher Education, Science & Technology and Bio-Technology, Govt. of West Bengal vide Memo No. 98 (Sanc.) HED-16014 (11)/9/2018-CG/4C-68/06 dt. 28.05.2019:

1. Set-up to determine the elastic constants (Young's modulus, rigidity modulus, Poisson's ratio and bulk modulus) of the material of a wire by Searle's method.
2. Slide callipers.
3. Screw gauge.
4. Hypsometer (container for boiling water) in Lees-and-Chorlton experiment.
5. Platinum resistance thermometer.
6. Thermometers (good quality).
7. Travelling microscope.
8. Bread boards.
9. Set-up to study the motion of spring and calculate (a) spring constant, (b) g and (c) modulus of rigidity.
10. Set-up to determine g and velocity for a freely falling body using digital timing technique/free fall method.
11. Set-up to determine the frequency of an electric/mechanical tuning fork by Melde's experiment.
12. Set-up to study Lissajous figures.
13. Set-up to investigate the motion of coupled oscillators.
14. Set-up to determine the height of a building by sextant/free fall method.
15. Set-up for measurement of charge sensitivity, current sensitivity and CDR of a ballistic galvanometer.
16. Set-up for measurement of field strength B and its variation in a solenoid (determine dB/dx) / Determination of magnetic field strength between two pole pieces for a given current using search coil and ballistic galvanometer.
17. Set-up for series and parallel LCR resonance measurements.
18. Carey-Foster bridge set-up.
19. Spectrometers for optical experiments/measurements.
20. Plane diffraction grating (2500/5000/6000 lines per inch).
21. Crown/flint glass prisms.
22. Set-up to determine the thickness of a thin paper by measuring the width of the interference fringes produced by a wedge-shaped film.
23. Set-up to determine the wavelength of sodium source using Michelson's interferometer/spectrometer.
24. Set-up to study the variation of thermo-emf of a thermocouple with difference of temperature of its two junctions.
25. To calibrate a thermocouple to measure temperature in a specified range using (i) Null Method, (ii) direct measurement using OP AMP difference amplifier.
26. ICs (two-input/three-input) for different logic gates (AND, OR, NOT, NAND, NOR).
27. Microprocessor 8085.
28. Set-up to build flip-flop (RS, clocked RS, D-type and JK) circuits using NAND gates.

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29 Set-up to build JK master-slave flip-flop using flip-flop ICs.
30 Set-up to build a 4-bit counter using D-type/JK flip-flop ICs and study timing diagram.
31 Set-up to make a 4-bit shift register (serial and parallel) using D-type/JK flip-flop ICs.
32 Set-up to design an astable multivibrator of given specifications using 555 timer.
33 Set-up to design a monostable multivibrator of given specifications using 555 timer.
34 Set-up to determine the Coefficient of Thermal Conductivity of Cu by Searle's Apparatus.
35 Set-up to determine the Coefficient of Thermal Conductivity of Cu by Angstrom's Method.
36 Set-up for measurement of Planck's constant using black-body radiation and photo-detector.
37 Set-up to study photo-electric effect: photo-current versus intensity and wavelength of light; maximum energy of photo-electrons versus frequency of light.
38 Set-up to determine Planck's constant using LEDs of at least four different colours.
39 Set-up to determine work function of material of filament of directly heated vacuum diode.
40 Set-up to determine the wavelength of H-alpha emission line of Hydrogen atom.
41 Set-up to determine the ionization potential of mercury.
42 Set-up to determine the absorption lines in the rotational spectrum of Iodine vapour.
43 Set-up to determine the value of e/m by (a) Magnetic focusing or (b) Bar magnet.
44 Set-up for the Millikan oil drop apparatus and determine the charge of an electron.
45 Set-up to show the tunneling effect in tunnel diode using I-V characteristics.
46 Set-up to determine the wavelength of laser source using diffraction of single slit.
47 Set-up to determine the wavelength of laser source using diffraction of double slits.
48 Set-up to determine (1) wavelength and (2) angular spread of He-Ne laser using plane diffraction grating.
49 Measurement of susceptibility of paramagnetic solution (Quincke`s Tube Method)
50 Set-up to measure the Magnetic susceptibility of Solids.
51 Set-up to determine the Coupling Coefficient of a piezo-electric crystal.
52 Set-up to measure the Dielectric Constant of a dielectric material with frequency.
53 Set-up to determine the complex dielectric constant and plasma frequency of metal using Surface Plasmon resonance (SPR).
54 Set-up to determine the refractive index of a dielectric layer using SPR.
55 Set-up to study the PE Hysteresis loop of a Ferroelectric Crystal.
56 Set-up to draw the B-H curve of Fe using solenoid and determine energy loss from hysteresis.
57 Set-up to measure the resistivity of a semiconductor (Ge) with temperature by four-probe method (room temperature to 150 ^{0}C) and to determine its band gap.
58 Set-up to determine the Hall coefficient of a semiconductor sample.
59 Set-up to verify the law of Malus for plane polarized light.
60 Set-up to analyze elliptically polarized Light by using a Babinet's compensator.
61 Set-up to study dependence of radiation on angle for a simple dipole antenna.
62 Set-up to determine the wavelength and velocity of ultrasonic waves in a liquid (Kerosene Oil, Xylene etc.) by studying the diffraction through ultrasonic grating.
63 Set-up to study the reflection, refraction of microwaves.
64 Set-up to study polarization and double slit interference in microwaves.
65 Set-up to determine the refractive index of liquid by total internal reflection using Wollaston's air-film.

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66 Set-up to determine the refractive Index of (1) glass and (2) a liquid by total internal reflection using a Gaussian eyepiece.
67 Set-up to study the polarization of light by reflection and determine the polarizing angle for air-glass interface.
68 Set-up to verify the Stefan's law of radiation and to determine Stefan's constant.
69 Set-up to determine the Boltzmann's constant using V-I characteristics of p-n junction diode.
70 Multi-meter (Metravi) (ordinary and with all functions).
71 Oscilloscope (20 MHz Dual Channel, Metravi/HTC).
72 Ballistic galvanometer (good quality).
73 Rubber tube (8 mm bore, good quality).
74 Rubber Disc (Lees-and-Chorlton experiment).
75 Function Generator (good quality).
76 AC milli-voltmeter/voltmeter.
77 Transistor characteristics (CE/CB) kit.
78 Transistor amplifier kit.
79 0.5 watt resistors of different standard values.
80 Capacitors: (0.033, 0.047, 0.05, 0.1, 1) μF bipolar
81 Inductors (air-core): (10, 15, 20, 30) mH
82 OP AMP ICs (741/351).
83 OP AMP experimental set-up.
84 Transistors: CL 100/SL 100, CK/SK 100.
85 Anderson's bridge experimental set-up.
86 De Sauty's bridge experimental set-up.
87 DC Regulated Power Supply (different ranges).
88 P-N junction/Zener diode.
89 Set-up to study the V-I characteristics of light emitting diode.
90 LEDs of at least four different colours.
91 Set-up to study V-I and power curves of solar cells, and find the maximum power point and efficiency.
92 Set-up to study the various biasing configurations of BJT for normal class A operation.
93 Set-up to design a CE transistor amplifier of a given gain (mid-gain) using voltage divider bias.
94 Set-up to design a Wien bridge oscillator for given frequency using an OP AMP.
95 To design a phase shift oscillator of given specifications using BJT.
96 Set-up to study the Colpitt's oscillator.
97 To study the analog to digital (ADC) converter IC.
98 Set-up to study the zero crossing detector and comparator.
99 To design a precision differential amplifier of given I/O specification using OP AMP.
100 To study quantum efficiency of CCDs.
101 Set-up for study of Zeeman effect with external magnetic field; hyperfine splitting.
102 Set-up for study of electron spin resonance: determine magnetic field as a function of the resonance frequency.
103 Set-up to design an amplitude modulator using transistor.
104 Set-up to study envelope detector for demodulation of AM signal.
105 Set-up to study FM generator and detector circuit.
106 Set-up to study AM transmitter and receiver.
107 Set-up to study FM transmitter and receiver.

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