

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 °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) μ F 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.

- 108 Set-up to study Time Division Multiplexing (TDM).
- 109 Set-up to study Pulse Amplitude Modulation (PAM).
- 110 Set-up to study Pulse Width Modulation (PWM).
- 111 Set-up to study Pulse Position Modulation (PPM).
- 112 Set-up to study ASK, PSK and FSK modulators.
- 113 Set-up to determine output characteristics of a LVDT & measure displacement using LVDT.
- 114 Set-up to measure strain using strain gauge.
- 115 Set-up for measurement of level using capacitive transducer.
- 116 Set-up to study the characteristics of a thermostat and determine its parameters.
- 117 Set-up to study distance measurement using ultrasonic transducer.
- 118 Set-up to calibrate semiconductor type temperature sensor (AD590, LM35, or LM75).
- 119 Set-up to measure the change in temperature of ambience using Resistance Temperature Device (RTD).
- 120 Set-up to create vacuum in a small chamber using a mechanical (rotary) pump and measure the chamber pressure using a pressure gauge.
- 121 Set-up for comparison of pickup of noise in cables of different types (co-axial, single shielded, double shielded, without shielding) of 2 m length, understanding of importance of grounding using function generator of mV level & an oscilloscope.
- 122 Set-up to design and study the Sample and Hold Circuit.
- 123 Set-up to design and analyze the Clippers and Clampers circuits using junction diode.
- 124 Set-up to plot the frequency response of a microphone.
- 125 Set-up to measure Q of a coil and influence of frequency, using a Q-meter.
- 126 DC ammeter, milli-ammeter, voltmeter, table galvanometer.
- 127 Meter bridge set-up.
- 128 Connecting wire for electrical/electronic experiments.
- 129 Tuning fork (good quality).
- 130 One-ended/two-ended connector jacks for electrical connection.
- 131 Stop clock.

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