LIST OF PRACTICAL FOR GRADE XI

Standard experiments

1- Measure length and diameter of a solid cylinder and hence estimate its volume quoting proper number of significant figures using Vernier callipers.

2- Measure the diameters of a few ball bearings of different sizes using Screw Gauge and estimate their volumes. Mention the uncertainty in each result.

3- Determine the radius of curvature of convex lens and a concave lens using a spherometer.

4- Determine the weight of a body by vector addition of forces.

5- Verify the two conditions of equilibrium using a suspended metre rod.

6- Measure the free fall time of a ball using a ticker-timer and hence calculate the value of 'g'. Evaluate your result and identify the source of error and suggest improvements.

7- Investigate the value of 'g' by free fall method using electronic timer.

8- Investigate momentum conservation by colliding trolleys and ticker-timer for elastic and inelastic collisions.

9- Investigate the downward force, along an inclined plane, acting on a roller due to gravity and study its relationship with the angle of inclination by plotting graph between force and $\sin\theta$.

10- Determine the moment of inertia of a fly wheel.

11- Investigate the fall of spherical steel balls through a viscous medium and determine.

(i) terminal velocity

(ii) coefficient of viscosity of the fluid

12- Verify that the time period of the simple pendulum is directly proportional to the square root of its length and hence find the value of 'g' from the graph.

13- Determine the acceleration due to gravity by oscillating mass-spring system.

14- Determine the value of 'g' by vibrating a metal lamina suspending from different points.

15- Determination of frequency of A.C by Melde's apparatus / electric sonometer.

16- Investigation of the laws of vibration of stretched strings by sonometer or electromagnetic method.

17- Determine the wavelength of sound in air using stationary waves and to calculate the speed of sound using resonance tube.

18- Determine the wavelength of light by using a diffraction grating and spectrometer.

19- Determine the slit separation of a diffraction grating by using laser light of unknown wavelength.

20- Measure the diameter of a wire or hair using laser.

21- Determine the pick count of a nylon mesh by using a diffraction grating and a laser.

22- Measure the mechanical equivalent of heat by electric method.

23- Determine the specific heat of a solid by electrical method.

Note:

1. At least 20 standard practicals alongwith exercises are required to be performed during the course of studies of class XI.

2. Use of centimetre graph paper be made compulsory.

LIST OF PRACTICAL FOR GRADE XII

Standard experiments

1. Determine time constant by charging and discharging a capacitor through a resistor.
2. Determine resistance of wire by slide Wire Bridge.
3. Determine resistance of voltmeter by drawing graph between R and I/V.
4. Determine resistance of voltmeter by discharging a capacitor through it.
5. Analyse the variation of resistance of thermistor with temperature.
6. Determine internal resistance of a cell using potentiometer.
7. Determine emf of a cell using potentiometer.
8. Determine the emf and internal resistance of a cell by plotting V against I graph.
9. Investigate the relationship between current passing through a tungsten filament lamp and the potential applied across it.
10. Convert a galvanometer into voltmeter of range 0 – 3 V.
11. Determine the relation between current and capacitance when different capacitors are used in AC circuit using different series and parallel combinations of capacitors.
12. Determine the impedance of a RL circuit at 50Hz and hence find inductance.
13. Determine the impedance of a RC circuit at 50Hz and hence find capacitance.
14. Determine Young's modulus of the material of a given wire using Searle's apparatus.
15. Draw characteristics of semiconductor diode and calculate forward and reverse current resistances.
16. Study the half and full wave rectification by semiconductor diodes by displaying on CRO
17. Study of the variation of electric current with intensity of light using a photocell.
18. Determine Planck's constant using internal potential barrier of different light emitting diodes.

19. Observe the line spectrum of mercury with diffraction grating and spectrometer to determine the wavelength of several different lines, and hence, draw a conclusion about the width of visible spectrum.

20. Using a set of at least 100 dice, simulate the radioactive decay of nuclei and measure the simulated half life of the nuclei.

21. Draw the characteristics curve of a Geiger Muller tube.

22. Determine the amount of background radiation in your surrounding and identify their possible sources.

23. Set up a G.M. point tube and show the detection of alpha particles with the help of CRO and determine the count rate using scaler unit.

Note:

1. At least 20 standard practical alongwith exercises are required to be performed during the course of studies of grade XII.
2. Use of centimetre graph paper be made compulsory.

LIST OF REQUIRED APPARATUS / EQUIPMENT FOR GRADE XI

Experiment No. Apparatus / Equipments

1. Vernier callipers, solid cylinder.

2. Micrometer screw gauge, ball bearings of different sizes.

3. Spherometer, a convex lens and a concave lens

4. Gravesand's apparatus or vector table, unknown weight, two hangers, slotted weights, spring balance, strip of plane mirror, thread, set squares, paper and ½ metre rod.

5. Metre rod, wedge, two stands, set of slotted weights, two spring balances.

6. Steel ball, ticker-tape vibrator, roll of ticker-tape, transformer, sellotape.

7. Free fall apparatus, steel ball, electronic timer with power supply, plumb line and metre rod.

8. Two trolleys, smooth flat board 2 metres in length fitted with levelling screws and wooden bumpers at the two ends, trolley weights metre rod, spirit level, ticker tape-timer apparatus.

9. Variable inclined plane fitted with pulley, roller, weights, pan, stopwatch.

10. Flywheel, stopwatch, string, pan, different weights, metre rod, piece of chalk and a Vernier callipers.

11. A long glass plastic tube about 1 m long, glycerine, steel ball bearings of five or six different diameters, dilute caustic soda, tweezers, metre rod, paper collars, and rubber bands.

12. Simple pendulum, stopwatch, stand, thread, cork, Vernier callipers.

13. Helical spring, heavy iron stand, hanger, slotted weights, stopwatch.

14. Metal lamina, iron stand, stopwatch.

15. AC vibrator, step-down transformer (6V-A.C), connecting wire, stout cotton thread, pulley, and scale plan.

16. Sonometer, tuning forks of different frequencies, hanger, set of ½ kilogram weights, wires of different diameters, scissors, sensitive balance, weight box and metre rod.

17. Resonance apparatus, two tuning forks of known frequency, thermometer, plumb line, Vernier callipers, cork or rubber pad, two set squares, beaker and water.

18. Spectrometer, diffraction grating, sodium lamp.

19. 1mW He-Ne laser source, diffraction grating, drawing board, a white screen, metre rod.

20. 1mW He-Ne laser source, thin wire and a suitable screen.

21. Nylon mesh fitted in wooden frame (used for screen printing), laser light, metre rule.

22. Electric calorimeter, 1/5 ^{o}C thermometer, battery, rheostat, key, ammeter, voltmeter, connecting wires, stopwatch, balance and weight box.

23. Electric calorimeter, 1/5 ^{o}C thermometer, battery rheostat, key ammeter, voltmeter, connecting wires, stopwatch, balance, weight box, unknown liquid.

LIST OF REQUIRED APPARATUS / EQUIPMENT FOR GRADE XII

Experiment No.	Apparatus / Equipment
1.	Galvanometer, power supply or battery, large value capacitor, key, stopwatch.
2.	Slide wire bridge, resistance box, unknown resistance, galvanometer, rheostat, cell, tapping key, connecting wires and sand paper.
3.	Voltmeter, resistance box, two keys, sand paper, connecting wires and graph paper.
4.	Voltmeter, power supply or battery, large value capacitor, key, stopwatch and slide wire bridge.
5.	Thermister, beaker, water, thermometer, slide wire bridge, resistance box, battery, galvanometer, rheostat, cell, tapping key, connecting wires, power supply or battery, large value capacitor, key, stop watch and slidewire bridge.
6.	Potentiometer, battery, ammeter, resistance box, rheostat, two keys, galvanometer, given cell, shunt wire, sand paper and connecting wires.
7.	Potentiometer, battery, tow-way key, rheostat, ammeter, key, shunt, wire, galvanometer, sand paper and connecting wires.
8.	Power supply or battery, voltmeter, ammeter, rheostat or resistance box or assorted resistors.
9.	36W, 12 volt car bulb, bulb holder, 12 volt battery, high resistance rheostat, voltmeter, ammeter, key, sand paper and connecting wires.
10.	Galvanometer, ammeter, standard voltmeter, accumulator, resistance box, plug key, rheostat, sand paper and connecting wires.
11.	A.C milliammeter, A.C voltmeter, capacitors of different capacitances 0.1 μF,0.2 μF, 0.3 μF, 0.4 μF, 0.5 μF, step-down transformer with tapings of 6, 12, volts or a variac, sand paper and connecting wires.
12.	R-L circuit, A.C power supply, step-down transformer, A.C Ammeter and A.C voltmeter.
13.	R-C circuit, A.C power supply, step-down transformer, A.C Ammeter and A.C voltmeter.
14.	Searle's apparatus, half kg slotted weights and metre rod.

15. A suitable semi conductor diode such as (IN 60), voltmeter (0 to 3V), voltmeter (0 to 50 V), milliammeter, micro ammeter, 500 ohms rheostat, 1 kilo ohm resistor, 3 volt battery, 0-250 volts continuously variable power supply, sand paper and connecting wires.

16. A.C power supply or step-down transformer, semiconductors diodes, circuit board, connecting wires and CRO.

17. Photocell, sensitive galvanometer, battery, rheostat, key, electric bulb preferably pointo-type lamp, suitable case for the bulb and photocell and connecting wires.

18. Spectrometer, L.E.D's fitted on board, power supply, diffraction grating.

19. Mercury lamp, spectrometer, diffraction grating,

20. 100 dice

21. Power supply, G.M tube with its holder and leads, scaler unit.

22. Geiger Muller tube (as Mullard MX 180), its tube holder and leads.

23. G.M point tube, α-source, CRO or scaler unit, power supply.

LIST OF REQUIRED APPARATUS/EQUIPMENT FOR STANDARD EXPERIMENTS AND EXERCISES PHYSICS FOR CLASSES XI-XII
(For a Class of 40 Students)

Sr. No.	Apparatus/ Equipment	Quantity
1.	Gravesand's Apparatus or Vector Table	10
2.	Hanger	10
3.	Slotted Weights	10
4.	Solid Cylinder	10
5.	Plane Mirror Strip	24
6.	Metre rod	20
7.	Protractor	20
8.	Metallic bob	10
9.	Set square	10
10.	Ticker tape	5
11.	Power supply (AC & DC)	10
12.	Electric stopclock	5
13.	Frequency meter	5
14.	Electromagnet	5
15.	Two way switch	5
16.	Vernier Callipers	10
17.	Cork	1 pkt
18.	Stand with clamp	10
19.	Stopwatch	10
20.	Thread	5 spools
21.	Helical spring	20
22.	Slotted weights with hanger	20 sets
23.	Trolley	10
24.	Smooth plane wooden surface with adjustable screws	5
25.	Trolley weight (1 kg) set	10
26.	Ticker-timer	5
27.	Plasticine	5 pkt
28.	Resonance tube	10
29.	Glycerine	5 litre
30.	Steel ball bearings of different sizes	1 pkt

31.	Bar magnet	10
32.	Half kg. Slotted masses	5 sets
33.	Fly wheel	5 sets
34.	Melde's apparatus	5
35.	Rubber pad	10
36.	Tuning forks (480 & 512 Hz)	10
37.	Electric oscillator	10 each
38.	Sonometer	5
39.	Tubes (one sliding into other)	10
40.	Thermometer	10
41.	Iron stand with clamp	10
42.	Spectrometer	20
43.	He-Ne- gas laser	10
44.	CRO	5
45.	Microphone	5
46.	Diffraction grating	10
47.	Measuring tape	5
48.	Electric calorimeter	10
49.	Rheostat (low resistance)	10
50.	Rheostat (high resistance)	10
51.	Ammeter – (0-3A)	10
52.	Voltmeter (0-15V)	10
53.	Half degree thermometer	10
54.	Physical balance	4
55.	Weight box	4
56.	Meter bridge	10
57.	Galvanometer	10
58.	Dry cell	5 pkt
59.	Resistance box (high resistance)	10
60.	Resistance box (low resistance)	10
61.	Resistance box (fractional)	10
62.	Jockey	10
63.	Keys	10
64.	Thermistor	10

65.	Beaker (250, 500 cc)	10 each
66.	Screw guage	10
67.	Potentiometer	10
68.	Car bulb with holder	10
69.	12 Volts Battery	2
70.	Plotting compass	12
71.	Capacitors (1 μ F - 8 μ F)	10 sets
72.	Two way key	10
73.	Auto transformer	10
74.	Semiconductor diode	20
75.	Milli ammeter	10
76.	Micro ammeter	10
77.	NPN transistor	20
78.	Photo cell	10
79.	Wooden box	10
80.	Lamp	10
81.	Step-down transformer	10
82.	AC voltmeter	6
83.	Multimeter (digital)	6
84.	GM tube	2
85.	Scaler Unit	2
86.	Inclined plane with changeable inclination	6
87.	Steel Roller	6
88.	Metal Lamina	10
89.	Printing Screen Pieces (Used)	10
90.	Dice	150
91.	GM Point Tube	5
92.	Set of LEDs of different colours fitted on board	5
93.	Mercury Lamp	5
94.	Spherometer	10