

LIST OF PRACTICAL FOR IX-X GRADES

Standard experiments

- 1 To measure the area of cross section by measuring diameter of a solid cylinder with vernier callipers.
- 2 To measure the volume of a solid cylinder by measuring length and diameter of a solid cylinder with vernier callipers.
- 3 To measure the thickness of a metal strip or a wire by using a screw gauge.
- 4 To find the acceleration of a ball rolling down an angle iron by drawing a graph between $2S$ and T^2 .
- 5 To find the value of “g” by free fall method.
- 6 Investigate the relationship between force of limiting friction and normal reaction to find the co-efficient of sliding friction between a wooden block and horizontal surface.
- 7 Measure the force of limiting friction by rolling a roller on a horizontal plane.
- 8 To determine the value of “g” by the Atwood’s machine.
- 9 To determine the resultant of two forces graphically using a Horizontal force table.
- 10 To verify the principle of moments by using a metre rod balanced on a wedge.
- 11 To find the tension in the strings by balancing a metre rod on the stands.
- 12 To find the weight of an unknown object by using vector addition of forces.
- 13 To find the weight of an unknown object by using principle of moments.
- 14 To study the effect of the length of simple pendulum on time and hence find “g” by calculation.
- 15 To prove that time period of a simple pendulum is independent of (i) mass of the pendulum (ii) amplitude of the vibration.
- 16 To study the relationship between load and extension (Helical spring) by drawing a graph.
- 17 To find the density of a body heavier than water by Archimedes principle.

- 18 To find the density of a liquid using 5 ml syringe (instead of density bottle).
- 19 To find the specific heat by the method of mixture using polystyrene cups (used as container of negligible heat capacity).
- 20 To draw a graph between temperature and time when ice is converted into water and then to steam by slow heating.
- 21 To measure the specific heat of fusion of ice.
- 22 To verify the laws of refraction by using a glass slab.
- 23 To find the refractive index of water by using concave mirror.
- 24 To determine the critical angle of glass using a semi circular slab and a light ray box/or by prism.
- 25 To trace the path of a ray of light through glass prism and measure the angle of deviation.
- 26 To find the focal length of a convex lens by parallax method.
- 27 To set up a microscope and telescope.
- 28 Verify Ohm's law (using wire as conductor).
- 29 To study resistors in series circuit.
- 30 To study resistors in parallel circuit.
- 31 To find the resistance of galvanometer by half deflection method.
- 32 To trace the magnetic field using a bar magnet.
- 33 To trace the magnetic field due to a current carrying circular coil.
- 34 To verify the truth table of OR, AND, NOT, NOR and NAND gates.
- 35 To make a burglar alarm/fire alarm using an appropriate gate.

Note:

1. At least 30 standard practical alongwith exercises are required to be performed during the two years of course of studies of grades IX-X.
2. Use of centimetre graph paper be made compulsory.

LIST OF APPARATUS / EQUIPMENTS REQUIRED ACCORDING TO THE PHYSICS EXPERIMENTS FOR IX-X GRADES

Experiment Apparatus /Equipment No.

1. Vernier callipers, solid cylinder.
2. Vernier callipers, solid cylinder.
3. Screw gauge, metal strip or small solid sphere or a piece of wire.
4. Angle iron 2m long, 2 wooden stands having V-shaped top, steel ball, stopwatch, metre rod.
5. Free-fall apparatus, a metal bob, stopwatch.
6. Horizontal plane, weight box, pulley, wooden block, pan, thread, spring balance, metre rod.
7. Horizontal plane, weight box, pulley, pan, thread, ruler.
8. Atwood's machine, stopwatch, metre rod.
9. Horizontal board fixed with three pulleys, plane mirror strip, 3 sets of slotted masses of 50 g with hangers, thread, metre scale, protractor.
10. Metre rod, wooden wedge, thread, weight box.
11. Two stands, two spring balances, metre rod, thread.
12. Horizontal board fixed with three pulleys, plane mirror strip, 3 sets of slotted masses of 50 g with hangers, thread, metre scale, protractor.
13. Wedge, metre rod, slotted weights, thread, object of unknown weight.
14. Metallic bob, vernier callipers, metre scale, stopwatch, splitted cork, stand with clamp.
15. Metallic bob, vernier callipers, metre scale, stopwatch, splitted cork, stand with clamp.
16. Helical spring, iron stand, half metre rod, set of masses with hanger.
17. Physical balance, weight box, solid body (glass stopper), beaker, thread, small wooden bench, water, thermometer.
18. 5 ml disposable syringe, liquid, water, beaker, weight box, physical balance.
19. Polystyrene cup, two thermometers, heating arrangement, metallic bob, physical balance, weight box.
20. Gas burner or spirit lamp, thermometer (-10°C to 110°C), iron stand, beaker, stopwatch, tripod stand, stirrer.
21. Copper calorimeter with lagging, thermometer, ice chips.

22. Rectangular glass slab, common pins, drawing pins, drawing board, geometry box, white sheet of paper.
23. Concave mirror, stand with a clamp, cork with a pin.
24. Semi circular glass block, ray box, drawing board, white paper and pins, protractor, half metre rule, pair of compasses or prism.
25. Glass prism, drawing board, white paper and drawing pins, common pins, geometry box.
26. Convex lens, two needles, three uprights, knitting needle and a metre rod.
27. Convex lens of different focal length and metre rod.
28. Voltmeter, ammeter, a piece of resistance wire, rheostat, battery, connecting wires, key.
29. Two standard resistances, voltmeter, ammeter, connecting wires, key, battery, rheostat.
30. Two standard resistances, voltmeter, ammeter, connecting wires, key, battery, rheostat.
31. Galvanometer, dry cell with box, high resistance box, low resistance box, two keys.
32. Bar magnet, drawing board, white paper and pins, magnetic compass, needle, pencil.
33. Circular coil fitted on a wooden board, compass needle, ammeter, battery, key.
34. OR gate, AND gate, NOT gate, NOR gate and NAND gate modules, power supply, LED indicator module.
35. NOT gate module, thermistor or smoke sensor, alarm system, power pack.

**COMPREHENSIVE LIST OF REQUIRED APPARATUS FOR A
STANDARD PHYSICS LABORATORY FOR GRADES IX-X
(FOR A GROUP OF 40 STUDENTS)**

Sr. No.	Apparatus/ Equipment	Quantity
1.	Vernier Callipers	12
2.	Screw gauge	12
3.	Solid cylinder	12
4.	Metallic wire	1 kg
5.	Small metallic sphere	12
6.	Angle iron 2m long with steel ball	10
7.	Wooden stands having V-shaped top	10
8.	Atwood's machine	10
9.	Stopwatch	10
10.	Free fall apparatus	10
11.	Metallic bob	10
12.	Wooden block	10
13.	Weight box with fractional weights	2
14.	Pulley	20
15.	Spring balance	20
16.	Horizontal Board fixed with three pulleys	10
17.	Pan	20
18.	Slotted weights with hangers set of 50g weights	20
19.	Slotted weights with hangers set of 20g weights	20
20.	Metre rod	20
21.	Wedge	12
22.	Plane mirror strip	24
23.	Protractor	24
24.	Inclined plane	10
25.	Steel roller with suspended pan	10
26.	Helical spring	24
27.	Iron stands with clamps	20

28.	Physical balance	02
29.	Beaker (Assorted 250 cc, 500 cc, 1000 cc)	24
30.	Small wooden bench	10
31.	5 ml disposable syringes	20
32.	Polystyrene cups	24
33.	Thermometer – 10°C to 110°C with half degree mark	24
34.	Gas burner or spirit lamp	10
35.	Solid lead shots	1 kg
36.	Tripod stand	10
37.	Stirrer	10
38.	Thread	5 spool
39.	Splitted cork	1 pkt
40.	Rubber pad	12
41.	Concave mirror with stand	12
42.	Needles with stands (Uprights)	24
43.	Kitting needle	12
44.	Rectangular glass slab	12
45.	Common pins	2 pkt
46.	Drawing board pins	2 pkt
47.	White paper	1 pkt
48.	Semi circular glass slab	10
49.	Light ray box	10
50.	Drawing board	15
51.	Compass	15
52.	Glass prism	12
53.	Convex lens ($f = 10\text{ cm}$ to 20 cm)	20
54.	Voltmeter (0 - 5V)	10
55.	Ammeter (0 – 3A)	10
56.	Resistance wire	1 spool
57.	Rheostat	10
58.	Connecting wires	2 kg

59.	Keys	20
60.	Standard resistances (1Ω , 2Ω , 5Ω , 10Ω)	10 each
61.	Galvanometer	10
62.	Dry cell with box	24
63.	High resistance box	12
64.	Low resistance box	12
65.	Bar magnet	12 set
66.	Circular coil (fitted on wooden board)	10
67.	Power supply	10
68.	OR gate module	10
69.	AND gate module	10
70.	NOR gate module	10
71.	NAND gate module	10
72.	NOT gate module	10
73.	LED indicator module	10
74.	Alarm system	5
75.	Smoke sensor	5
76.	Thermistor	5