

Marks

8. **Scene-1** : The ratio of the number of turns of two coils of a step up transformer is 1 : 5. The voltage of the primary coil is 18V and the current of the secondary coil is 1.4 A.

Scene-2 : Two charged spheres of radius 0.15m and 0.5m have potentials of 12V and 18V respectively. The distance between their centers is 4m.

- (a) What is semiconductor? 1
 (b) p-n junction diode acts as a rectifier. —Explain. 2
 (c) Calculate the power of primary coil of the transformer in scene-1. 3
 (d) If a 5C charge is placed at the midpoint of the joining line the centers of the two spheres in scene-2, will it remain in equilibrium? Analyze mathematically. 4



01 Set

PHYSICS (CREATIVE)

[According to the Syllabus of 2025]

Subject Code :

1	3	6
---	---	---

Time—2 hours and 35 minutes

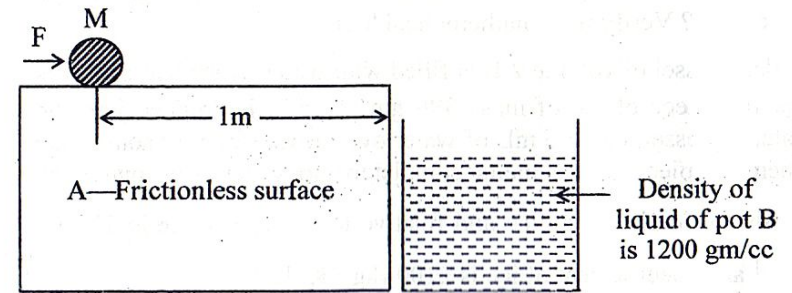
Full marks—50

[N.B. The figures in the right margin indicate full marks. Read the stems carefully and answer the associated questions. Answer any five questions.]

Marks

1. The radius of a spherical object is 1.5 cm. Its diameter was measured with slide calipers and found to be 3.2 cm. If the object is thrown from the ground vertically upward with a velocity of 54 ms^{-1} , it falls to the earth at certain time.
- (a) What is vernier constant? 1
 (b) The path of an object moving with uniform velocity is only rectilinear. —Explain. 2
 (c) Find the relative error of measuring the diameter of the spherical object. 3
 (d) The object will be seen twice at different velocities at different time at a height of 70 meters above the ground. —Analyze mathematically. 4

2.



Mass of object M is 4 kg and diameter is 20 cm. M is kept on surface A. By applying F force, it gains 10 ms^{-1} velocity at the end of surface before falling on the liquid of pot B.

- (a) What is tension? 1
 (b) Acceleration due to gravity is a uniform acceleration. —Explain. 2
 (c) Determine the value of F . 3
 (d) Will the object M float on liquid B or not? Analyze mathematically. 4

