

COMMON SECOND MID-TERM TEST - 2022

A

Standard XI

Reg.No.

--	--	--	--	--	--

PHYSICS

Time : 1.30 hrs

Part - I

Marks : 50

I. Choose the correct answer:

10 x 1 = 10

1. If the mass and radius of the earth are both doubled, then the acceleration due to gravity 'g'
 - a) remains the same
 - b) $\frac{g}{2}$
 - c) 2g
 - d) 4g
2. The gravitational potential energy of the Moon with respect to Earth is
 - a) always positive
 - b) always negative
 - c) can be positive (or) negative
 - d) always zero
3. If the distance between the Earth and Sun were to be doubled, from its present value, the number of days in a year would be
 - a) 64.5
 - b) 1032
 - c) 182.5
 - d) 730
4. The linear momentum and position vector of the planet is perpendicular to each other at
 - a) perihelion and aphelion
 - b) at all points
 - c) only at perihelion
 - d) no point
5. The Young's modulus for a perfect rigid body is
 - a) 0
 - b) 1
 - c) 0.5
 - d) infinity
6. With an increase in temperature, the viscosity of liquid and gas respectively will
 - a) increase and increase
 - b) increase and decrease
 - c) decrease and increase
 - d) decrease and decrease
7. If the temperature of the wire is increased, then the Young's modulus will
 - a) remain the same
 - b) decrease
 - c) increase rapidly
 - d) increased by a very small amount
8. If a wire is stretched to double of its original length, then the strain in the wire is
 - a) 1
 - b) 2
 - c) 3
 - d) 4
9. The graph between volume and temperature in Charle's law is
 - a) an ellipse
 - b) a circle
 - c) is a straight line
 - d) a parabola
10. In hot summer, after a bath the body's
 - a) internal energy decreases
 - b) internal energy increases
 - c) heat decreases
 - d) no change in internal energy and heat

Part - II

II. Answer any 5 questions. (Q.No.14 is compulsory)

5 x 2 = 10

11. Define gravitational potential energy.
12. State Newton's universal law of gravitation.

(2)

XI Physics

13. Why is there no lunar eclipse and solar eclipse every month?
14. A wire 10m long has a cross-sectional area $1.25 \times 10^{-4} \text{ m}^2$. It is subjected to a load of 5 kg. If Young's modulus of material is $4 \times 10^{10} \text{ Nm}^{-2}$, calculate the elongation produced in the wire. Take $g = 10 \text{ ms}^{-2}$
15. Which one of these is more elastic, steel (or) rubber? Why?
16. Define Poisson's ratio.
17. Define one mole.
18. Define molar specific heat capacity.

Part - III

III. Answer any 5 questions. (Q.No.20 is compulsory)

5 x 3 = 15

19. What are geostationary and polar satellites.
20. Calculate the energy of the (i) Moon orbiting the earth and (ii) Earth orbiting the sun
(Given : $M_E = 6.02 \times 10^{24} \text{ kg}$, $M_m = 7.35 \times 10^{22} \text{ kg}$, $R_m = 3.84 \times 10^5 \text{ km}$, $G = 6.67 \times 10^{-11} \text{ Nm}^2\text{Kg}^{-2}$).
21. State Kepler's three laws.
22. What are the factors affecting the surface tension of a liquid?
23. State Pascal's law in fluids and Archemede's principle.
24. Distinguish between cohesive and adhesive forces.
25. Distinguish between streamlined flow and turbulent flow.
26. Define latent heat capacity. Give its unit.

Part - IV

IV. Answer all the questions.

3 x 5 = 15

27. a) Derive an expression for escape speed.

(OR)

- b) Derive Poiseuille's Formula for the volume of a liquid flowing per second through a pipe under streamlined floor.

28. a) Derive the expression for the terminal velocity of a sphere moving in a high viscous fluid using Stokes force.

(OR)

- b) Explain in detail Newton's law of cooling.

29. a) Explain the variation of 'g' with depth from the Earth's surface.

(OR)

- b) State and prove Bernoulli's theorem for flow of incompressible, non-viscous and streamlined flow of fluid.