VGR COACHING CENTER		
CLASS-XI	PHYSICS	MARK-75

PART-A

CHOOSE THE CORRECT ANSWER

1. If the masses of the Earth and Sun suddenly double, the gravitational force between them will
   (a) remain the same (b) increase 2 times (c) increase 4 times (d) decrease 2 times
2. The time period of a satellite orbiting Earth in a circular orbit is independent of ……..
   (a) Radius of the orbit (b) The mass of the satellite
   (c) Both the mass and radius of the orbit (d) Neither the mass nor the radius of its orbit
3. 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
4. If a person moves from Chennai to Trichy, his weight …..
   (a) increases (b) decreases
   (c) remains same (d) increases and then decreases
5. An object of mass 10 kg is hanging on a spring scale which is attached to the roof of a lift. If
   the lift is in free fall, the reading in the spring scale is ……..
   (a) 98 N (b) zero (c) 49 N (d) 9.8 N
6. If a wire is streched to double of its original length, then the strain in the wire is ……
   (a) 1 (b) 2 (c) 3 (d) 4
7. 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

8. The wettability of a surface by a liquid depends primarily on
   (a) viscosity (b) surface tension
   (c) density (d) the angle of contact between the surface and the liquid
9. n a horizontal pipe of a non-uniform cross-section, water flows with a velocity of 1 ms^{-1} at a point where the diameter of the pipe is 20 cm. The velocity of water 1.5 (ms^{-1}) at a point where the diameter of the pipe is.
   (a) 8 (b) 16 (c) 24 (d) 32
10. Two wires are made of the same material and have the same volume. The area of cross-sections of the first and the second wires are A and 2A respectively. If the length of the first wire is increased by Δl on applying a force F, how much force is needed to stretch the second wire by the same amount? (NEET model 2018)
    (a) 2 (b) 4 (c) 8 (d) 16
11. The graph between volume and temperature in Charles' law is …….
    (a) an ellipse (b) a circle (c) a straight line (d) a parabola
12. When a uniform rod is heated, which of the following quantity of the rod will increase
    (a) mass (b) weight (c) center of mass (d) moment of inertia
13. When food is cooked in a vessel by keeping the lid closed, after some time the steam pushes the lid outward. By considering the steam as a thermodynamic system, then in the cooking process …….
    (a) $Q > 0, W > 0$ (b) $Q < 0, W > 0$ (c) $Q > 0, W < 0$ (d) $Q < 0, W < 0$
14. A distant star emits radiation with maximum intensity at 350 nm. The temperature of the star is
    (a) 8280 K (b) 5000 K (c) 7260 K (d) 9044 K
15. The efficiency of a heat engine working between the freezing point and boiling point of water is …..
    (a) 6.25% (b) 20% (c) 26.8% (d) 12.5%

PART-B

ANY 7 Q.NO 25 IS COMPULSORY

16. Why is the energy of a satellite (or any other planet) negative?
17. Which one of these is more elastic, steel or rubber? Why?
18. Define coefficient of viscosity of a liquid.
19. What is Reynold's number? Give its significance.

20. Define specific heat capacity and give its unit.
21. State Stefan-Boltzmann law
22. What is an epoch?
23. Distinguish between cohesive and adhesive forces.
24. State Kelvin-Planck statement of second law of thermodynamics.
25. An ideal refrigerator keeps its content at 0°C while the room temperature is 27°C. Calculate its coefficient of performance.

PART-C ANY 7

Q.NO 35 IS COMPULSORY

26. State Kepler's three laws.
27. Explain geostationary and polar satellites?
28. Distinguish between streamlined flow and turbulent flow.
29. Explain the different types of modulus of elasticity
30. Derive an expression for energy of satellite.
31. Obtain an expression for the excess of pressure inside a liquid drop
32. What is PV diagram? Draw the PV diagram for:
    (a) Isothermal process (b) Adiabatic process
33. Comparison of simple harmonic motion and angular harmonic motion
34. State the laws of the simple pendulum?
35. A Carnot engine whose efficiency is 45% takes heat from a source maintained at a temperature of 327°C. To have an engine of efficiency 60% what must be the intake temperature for the same exhaust (sink) temperature?

ANSWER ALL QUESTIONS

36. Derive an expression for escape speed.

    OR

    Derive the expression for the terminal velocity of a sphere moving in a high viscous fluid using stokes force.
37. Derive Poiseuille's formula for the volume of a liquid flowing per second through a pipe under streamlined flow.

    OR

    What is capillarity? Obtain an expression for the surface tension of a liquid by the capillary rise method.

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

OR

Explain the horizontal oscillations of a spring.

39. Discuss in detail the energy in simple harmonic motion

OR

a. Derive the work done in an adiabatic process

40. Explain in detail Newton's law of cooling.

OR

Derive Mayer's relation for an ideal gas.

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