திருவள்ளூர் மாவட்டம்

13.11.2024

SECOND MID TERM TEST - 2024

Standard XI

Reg.No. | | | | | | |

PHYSICS

Time : 1.30 hrs **Part - I** *Marks : 50*

I. Choose the correct answer: **10 x 1 = 10**

1. The graph between volume and temperature in Charle's law is
   a) an ellipse b) a circle c) a parabola d) a straight line
2. When you exercise in the morning, by considering your body as thermodynamic system, which of the following is true?
   a) $\Delta U < 0, W > 0$ b) $\Delta U > 0, W > 0$ c) $\Delta U < 0, W < 0$ d) $\Delta U = 0, W > 0$
3. In an isochoric process, we have
   a) $W = 0$ b) $Q = 0$ c) $\Delta U = 0$ d) $\Delta T = 0$
4. 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
5. If the temperature of the wire is increased, then the Young's modulus will
   a) remain the same b) decrease
   c) increase rapidly d) increase by very a small amount
6. 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 2 A respectively. If the length of the first wire is increased by Δl on applying a force F. How much force is needed to stretched the second wire by the same amount?
   a) 2 F b) 4 F c) 8 F d) 16 F
7. Consider two wires X and Y. The radius of wire X is 3 times the radius of Y. If they are structured by the same load, then the stress on Y is
   a) equal to that on X b) thrice that on X
   c) nine times that on X d) half that on X
8. If the mass and radius of the Earth are both doubled, then the acceleration due to gravity 'g'
   a) remains same b) g/2 c) 2 g d) 4 g
9. According to Kepler's second law, the radial vector to a planet from the Sun sweeps out equal areas in equal intervals of time. This law is a consequence of
   a) conservation of linear momentum b) conservation of angular momentum
   c) conservation of energy d) conservation of kinetic energy
10. 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

Part - II

II. Answer any 5 questions. (Q.No.18 is compulsory) 5 x 2 = 10

11. Define the gravitational field. Give its unit.
12. What is meant by escape speed in the case of the Earth?
13. State Newton's Universal law of gravitation.
14. Which one of these is more elastic, steel or rubber? Why?
15. State the law of Flotation.
16. State Stefan-Boltzmann law.
17. What is PV diagram?
18. A wire of length 2 m with the area of cross-section 10^{-6} m^2 is used to suspend a load of 980 N. Calculate the stress developed.

Part - III

III. Answer any 5 questions. (Q.No.26 is compulsory) 5 x 3 = 15

19. What are geostationary and polar satellites?
20. Why is there no lunar eclipse and solar eclipse every month?
21. Distinguish between streamlined flow and turbulent flow.
22. State the principle and usage of Venturi meter.
23. What are the factors affecting the surface tension of a liquid?
24. Define specific heat capacity and give its unit.
25. Why does heat flow from a hot object to a cold object?
26. A refrigerator has COP of 4. How much work must be supplied to the refrigerator in order to remove 200 J of heat from its interion?

Part - IV

IV. Answer all the questions. 3 x 5 = 15

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

(OR)

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

28. a) Explain the different types of moduli of elasticity.

(OR)

b) Discuss various modes of heat transfer.

29. a) Derive an expression for energy of satellite.

(OR)

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

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