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FIRST REVISION TEST - 2025

Standard - XI

Time: 3.00 hrs   **PHYSICS**   Marks:70

Part - A

I Answer all the questions. Choose the correct answers.   15x1=15

1. If the masses of the Earth and Sun suddenly double, the gravitational force between them will.
   a) remains the same
   b) increase 2 times
   c) increase 4 times ✓
   d) decrease 2 times

2. The Wettability of a Surface by a liquid defends primarily on
   a) viscosity
   b) surface tension
   c) density
   d) angle of contact between the surface and the liquid ✓

3. 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%

4. The ratio $\gamma = \dfrac{C_p}{C_v}$ for a gas mixture consisting of 8g of helium and 16g of oxygen is _____

   a) $\dfrac{23}{15}$
   b) $\dfrac{15}{23}$
   c) $\dfrac{27}{17}$ ✓
   d) $\dfrac{17}{27}$

5. In a simple harmonic oscillation, the acceleration against displacement for one complete oscillation will be _____
   a) an ellipse
   b) a circle
   c) a parabola
   d) a straight line ✓

6. A sound wave whose frequency is 5000 Hz travels in air and then hits the water surface. The ratio of its wavelengths in water and air is _____
   a) 4.30 ✓
   b) 0.23
   c) 5.30
   d) 1.23

7. Force acting on the particle moving with constant speed is
   a) always zero
   b) need not be zero ✓
   c) always non-zero
   d) cannot be concluded

8. The length of a body is measured as 3.51m, if the accuracy is 0.01m, then the percentage error in the measurement is _____

a) 351%   b) 1%   c) 0.28% ✓   d) 0.035%

9. A rope is wound around a hollow cylinder of mass 3kg and radius 40cm. What is the angular acceleration of the cylinder if the rope is pulled with a force 30N?

a) 0.25 rad s⁻¹   b) 25 rad s⁻¹ ✓   c) 5 ms⁻¹   d) 25 ms⁻¹

10. A uniform force of $(2\hat{i} + \hat{j})$N acts on a particle of mass 1kg. The particle displaces from position $(3\hat{j} + \hat{k})$m to $(5\hat{i} + 3\hat{j})$m. The workdone by the force on the particle is _____

a) 9J   b) 6J   c) 10J ✓   d) 12J

11. Two objects of masses m_1 and m_2 fall from the heights h_1 and h_2 respectively. The ratio of the magnitude of their momenta when they hit the ground is _____

a) $\sqrt{\dfrac{h_1}{h_2}}$ b) $\sqrt{\dfrac{m_1 h_1}{m_2 h_2}}$ c) $\dfrac{m_1}{m_2}\sqrt{\dfrac{h_1}{h_2}}$ d) $\dfrac{m_1}{m_2}$

12. The value of Wien's constant is _____

a) 5.67×10^8 mk   b) 5.67×10^8 mk   c) 2.898×10^{-3} mk ✓   d) 2.898×10^3 mk

13. 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

14. The velocity of a particle V at an instant t is given by $V = at + bt^2$. The dimensions of b is _____

a) [L]   b) [LT⁻¹]   c) [LT⁻²]   d) [LT⁻³] ✓

15. If the linear momentum of the object is increased by 0.1%, then the kinetic energy is increased by _____

a) 0.1%   b) 0.2% ✓   c) 0.4%   d) 0.01%

PART - B

I. Answer any six questions. Question No. 24 is compulsory.   6x2=12

16. Define Centre of mass.

17. What is dimensional constant? Give examples.

18. Calculate the energy consumed in electrical units when a 75W fan is used for 5 hours daily for one month (30 days).

19. State Stefan - Boltzmann law

20. Write down the relation between frequency, wavelength and velocity of a wave.

21. Which one of these is more elastic. steel or rubber? Why?

22. Difference between distance and displacement.

23. State the law of equipartition of energy

24. During a cyclic process, a heat engine absorbs 500J of head from a hot reservoir, does work and ejects an amount of heat 300J into the surroundings. Calculate the efficiency of the heat engine?

PART - C

6x3=18

III. **Answer any six questions. Question number 33 is compulsory.**

25. Give the applications of dimensional analysis.

26. If the position vector of the particle is given by
    $\vec{r} = 3t^2\hat{i} + 5t\hat{j} + 4\hat{k}$. Find
    a) The velocity of the particle at t=35   b) Speed of the particle at t=35

27. Explain about the geostationary and polar satellites.

28. State the laws of simple pendulum?

29. Explain the types of thermal expansion.

30. Difference between progressive waves and standing waves.

31. State Newton's laws of motion?

32. Distinguish between elastic and inelastic collision.

33. If a flute sounds a note with 450Hz, what are the frequencies of the second, third, and fourth harmonics of this Pitch?

PART - D

5x5=25

IV. **Answer in detail.**

34. a) Derive Mayer's relation for an ideal gas.

(OR)

b) Explain how overtones are produced in a closed organ pipe.

35. a) Explain in detail the various types of errors.

(OR)

b) State and Prove parallel axes theorem.

36. a) Show that in an inclined plane, angle of friction is equal to angle of repose.

(OR)

b) Explain the variation of acceleration due to gravity "g" with altitude.

37. a) Explain different types of modulus of Elasticity.

(OR)

b) Explain the horizontal osillations of a Spring.

38. a) Obtain an expression for the relation between power and velocity.

(OR)

b) Explain in detail the triangle law of addition.

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