

CHENGALPATTU DISTRICT  
SECOND REVISION TEST - 2025

Standard XI

Reg.No. 

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PHYSICS

Time : 3.00 hrs

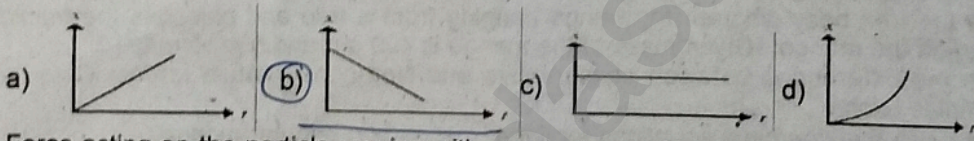
Part - I

Marks : 70

15 x 1 = 15

1. Choose the correct answer:

1. Which of the following pairs of physical quantities have same dimension?  
a) force and power    **b) torque and energy**    c) torque and power    d) force and torque
2. If a person moves from Chennai to Trichy, his weight  
a) increases    **b) decreases**    c) remains same    d) increases and then decreases
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. For a given gas molecule at a fixed temperature, the area under the Maxwell-Boltzmann distribution curve is equal to  
**a)  $\frac{PV}{KT}$**     b)  $\frac{KT}{PV}$     c)  $\frac{P}{NKT}$     d) PV
5. Error in the measurement of radius of a circle is 1%. Then error in the measurement of area is  
**a) 2%**    b) 1%    c) 3%    d) 4%
6. Which of the following graphs represents the position time graph of a particle moving with negative velocity?



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. A spring of force constant  $k$  is cut into two pieces such that one piece is double the length of the other. Then, the long piece will have a force constant of  
a)  $\frac{2}{3}k$     **b)  $\frac{3}{2}k$**     c)  $3k$     d)  $6k$
9. A couple produces,  
a) Pure rotation    b) pure translation    c) rotation and translation    d) no motion
10. If a particle executes uniform circular motion in the  $xy$  plane in clock wise direction, then the angular velocity is in  
a)  $+y$  direction    b)  $+z$  direction    **c)  $-z$  direction**    d)  $-x$  direction
11. Consider two springs whose force constants are  $1 \text{ Nm}^{-1}$  and  $2 \text{ Nm}^{-1}$  which are connected in series. Calculate the effective spring constant ( $k_s$ )  
a)  $6 \text{ Nm}^{-1}$     b)  $\frac{3}{2} \text{ Nm}^{-1}$     c)  $3 \text{ Nm}^{-1}$     **d)  $\frac{2}{3} \text{ Nm}^{-1}$**
12. Equation of travelling wave on a stretched string of linear density  $5 \text{ g/m}$  is  $y = 0.03 \sin(450t - 9x)$ , where distance and time are measured in SI units. The tension in the string is  
a)  $5 \text{ N}$     **b)  $12.5 \text{ N}$**     c)  $7.5 \text{ N}$     d)  $10 \text{ N}$
13. 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**
14. The Young's modulus for a perfect rigid body is  
a) 0    b) 1    c) 0.5    **d) infinity**

15. Bernoulli's equation is valid  
 a) constant, viscous, incompressible, temperature dependent flow.  
 b) variable, non-viscous, incompressible, temperature- dependent flow.  
 c) constant, non-viscous, incompressible, temperature- independent flow.  
 d) variable, non-viscous, incompressible, temperature- independent flow.

## Part - II

6 x 2 = 12

## II. Answer any 6 questions. (Q.No.24 is compulsory)

16. What are the uses of dimensional analysis.  
 17. An athlete covers 5 rounds on a circular track of radius 100 m. Calculate the total distance and displacement travelled by him  
 18. State Newton's Universal law of gravitation.  
 19. Define Poisson's ratio.  
 20. What is impulse or impulsive force?  
 21. Give any two examples of torque in day-to-day life.  
 22. Define the coefficient of performance.  
 23. Why moon has no atmosphere?  
 24. Calculate the work done by a force of 30 N in lifting a load of 2kg to a height of 10m  
 ( $g = 10 \text{ ms}^{-2}$ )

## Part - III

6 x 3 = 18

## III. Answer any 6 questions. (Q.No.33 is compulsory)

25. What are the factors affecting Brownian motion?  
 26. Explain resonance. Give an example.  
 27. Write the rules for determining significant figures.  
 28. Draw the free body diagram for mango hanging from a tree and calculate the tension acting on the mango. (Given mass of the mango is 400 gm and  $g = 10 \text{ m/s}^2$ ).  
 29. Write the differences between conservative and Non-conservative forces. Give two examples each.  
 30. Write down the kinematic equations for linear motion and angular motion.  
 31. A force of  $(4\hat{i} - 3\hat{j} + 5\hat{k})\text{N}$  is applied at a point whose position vector is  $(7\hat{i} + 4\hat{j} - 2\hat{k})\text{m}$ . Find the torque of force about the origin.  
 32. What is weightlessness? Give an example.  
 33. If excess pressure is balanced by a column of oil (with specific gravity 0.8) 4 mm high, where  $R = 2.0 \text{ cm}$ , find the surface tension of the soap bubble.

## Part - IV

## IV. Answer all the questions.

5 x 5 = 25

34. a) i) Write a note on radar method to measure larger distances.  
 ii) The temperatures of two bodies measured by a thermometer are  $t_1 = (20 \pm 0.5)^\circ\text{C}$ ,  $t_2 = (50 \pm 0.5)^\circ\text{C}$ . Calculate the temperature difference and the error therein. (OR)  
 b) State and prove Bernoulli's theorem for a flow of incompressible, non-viscous, and streamlined flow fluid.  
 35. a) Explain the variation of  $g$  with depth from the Earth's surface. (OR)  
 b) Describe the total degrees of freedom for monoatomic molecule, diatomic molecule and triatomic molecule.  
 36. a) Prove that the frequencies of harmonics are in the ratio for the open organ pipes,  $f_1 : f_2 : f_3 : f_4 : \dots = 1 : 2 : 3 : 4 : \dots$  (OR)  
 b) Explain in detail Newton's law of cooling.  
 37. a) Discuss the properties of scalar products. (OR)  
 b) Explain in details about elastic collisions in one dimension  
 38. a) Explain the motion of blocks connected by a string in Vertical motion. (OR)  
 b) State and prove Perpendicular axis theorem.

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