

CLASS: XI

## PHYSICS

Reg.No

Time: 3.00 Hours

Marks 70

### PART - I

15x1=15

1. Choose the correct answer.

1. Which of the following has the highest number of Significant figures?  
 (a) 0.007 m<sup>3</sup>      (b) 2.64 x 10<sup>-3</sup> kg      (c) 0006032 m<sup>2</sup>      (d) 6.3200 J
2. An object is dropped in an unknown planet from height 50 m, it reaches the ground in 2s. The acceleration due to gravity in this unknown planet is  
 (a) g = 20ms<sup>-2</sup>      (b) g = 25 ms<sup>-2</sup>      (c) g = 15 ms<sup>-2</sup>      (d) g = 30 ms<sup>-2</sup>
3. What is angle between A = i + j and B = i - j  
 (a) 45°      (b) 90°      (c) 30°      (d) 180°
4. In inelastic Collision ..... is not changed.  
 (a) Kinetic energy      (b) Potential energy      (c) Internal energy      (d) Pressure energy
5. A particle undergoes uniform circular motion. The angular momentum of the particle remains conserved about.  
 (a) the centre point of the circle.      (b) the point on the Circumference of the circle.  
 (c) any point inside the circle.      (d) any point outside the circle.
6. 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) 9.8N
7. For a given material, the rigidity modulus is (1/3)rd of Young's modulus. Its Poisson's ratio is  
 (a) 0      (b) 0.25      (c) 0.3      (d) 0.5
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 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%
10. What is the minimum coefficient of friction for a Solid sphere to roll without Slipping on an inclined Plane of inclination α?  
 a)  $\frac{2}{3} \tan \alpha$       b)  $\frac{1}{3} \tan \alpha$       c)  $\frac{2}{7} \tan \alpha$       d)  $\frac{4}{3} \tan \alpha$
11. A Sample of ideal gas is at equilibrium. which of the following quantity is zero?  
 (a) rms Speed      (b) average speed      (c) average velocity      (d) most probable speed.
12. The damping force on an oscillator is directly proportional to the velocity. The unit of the Constant of proportionality is  
 (a) kg ms<sup>-1</sup>      (b) kg ms<sup>-2</sup>      (c) kgs<sup>-1</sup>      (d) kgs
13. An air column in a pipe which is closed at one end, will be in resonance with the vibrating body of frequency 83 HZ. Then length of air column is  
 (a) 1.5 m      (b) 0.5 m      (c) 1.0 m      (d) 2.0m
14. The graph between volume and temperature in Charles law is  
 (a) an ellipse      (b) a circle      (c) a straight line      (d) the parabola.
15. 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

**II Answer any Six questions. Question no 23 is Compulsory .**

- 16 Explain the principle of homogeneity of dimensions
- 17 what is non-uniform Circular motion?
- 18 If a Stone of mass 0.25 kg tied to a string executes uniform Circular motion with a speed of  $2\text{ms}^{-1}$  of radius 3m. what is the magnitude of tensional force acting on the Stone?
19. what are the conditions in which force Can not produce torque?
20. Why is there no lunar eclipse and Solar eclipse every month ?
- 21 Which one of these is more elastic, Steel or rubber why?
- 22 What is PV diagram?
- 23 Calculate the speed of sound in a Steel rod whose Young's modulus  $Y = 2 \times 10^{11} \text{ Nm}^{-2}$  and  $P = 7800 \text{ kgm}^{-3}$
- 24 Explain resonance Give an example

### PART - III

**III Answer any Six questions. Question no 30 is Compulsory .**

**6x3=18**

- 25 What are the limitations of dimensional analysis?
- 26 Write down the expression for angle made by resultant acceleration and radius vector in the non-uniform circular motion.
- 27 State Newton's three laws.
- 28 Arrive at an expression for power and velocity.
- 29 A Cyclist while negotiating a circular path with Speed  $20 \text{ ms}^{-1}$  is found to bend an angle by  $30^\circ$  with vertical. what is the radius of the circular path? (given  $g = 10 \text{ ms}^{-2}$ )
- 30 Let  $2.4 \times 10^{-4} \text{ J}$  of work is done to increase the area of a film of soap bubble from  $50 \text{ cm}^2$  to  $100 \text{ cm}^2$ . Calculate the value of surface tension of soap Solution
- 31 Describe the Brownian motion.
- 32 write down the difference between Simple harmonic motion and angular Simple harmonic motion
- 33 write down the relation between frequency, wavelength and Velocity of a wave.

### PART - IV

**IV Answer all the questions .**

**5x5=25**

- 34 (a) Explain in detail the various types of error. (or)  
(b) state and explain work energy principle. Mention any three examples for it.
- 35 (a) Discuss the properties of vector products. (or)  
(b) Derive the expression for moment inertia of a rod about its centre and perpendicular to the rod.
- 36 (a) Explain the variation of  $g$  with altitude. (or)  
(b) State and prove Bernoulli's theorem for a flow of incompressible, non-Viscous and Streamlined flow of fluid
- 37 (a) Derive Mayer's relation for an ideal gas. (or)  
(b) write down the postulates of kinetic theory of gases.
- 38 (a) Discuss in detail the energy in Simple harmonic motion. (or)  
(b) Prove the law of Conservation of linear momentum use it to find the initial velocity of a bullet when a bullet is fired from it