SRS

SECOND REVISION EXAMINATION - 2024

11 - Std

PHYSICS

1	1	3	3	2	0	6

Time : 3.00Hrs. Ex. Date:- 07/02/2024 Marks : 70

PART - I

Note : (i) Answer all the questions. 15 x 1 = 15

(ii) Choose the most appropriate answer from the given four alternates and write the option code and the corresponding answer.

1. When an object is at rest on the inclined rough surface,
   a. static and kinetic friction acting on the object is zero
   b. static and kinetic frictions are not zero
   c. static friction is zero but kinetic friction is not zero
   d. static friction is not zero and kinetic friction is zero
2. If vectors $\hat{i}-3\hat{j}+5\hat{k}$ and $i-3j+ak$ are equal vectors, then the value of a is,
   a. -5 b. 2 c. -3 d. 5
3. The velocity of longitudinal wave in the elastic medium is,
   a) $\sqrt{\frac{E^2}{\rho}}$ b) $\sqrt{E\rho}$ c) $\sqrt{\frac{E}{\rho}}$ d) $\sqrt{\left(\frac{\rho}{E}\right)}$
4. If an object is dropped from the top of a building and it reaches the ground at t = 4 s, then the height of the building is (ignoring air resistance) (g = 10 ms^{-2})
   a. 77.3 m b. 80.5 m c. 78.4 m d. 79.2 m
5. A small sphere of radius 2 cm falls from rest in a viscous liquid . Heat is produced due to viscous force. The rate of production of heat when the sphere attains its terminal velocity is proportional to,
   a. 2^5 b. 2^2 c. 2^4 d. 2^3
6. Which of the following pairs of physical quantity does not have similar dimensions?
   a. Angular momentum and planck's constant b. strain and angle
   c. Tension and Surface tension d. Stress and Young's modulus
7. If a person moves from Chennai to Trichy, his weight,
   a. increases b. decreases
   c. remains same d. increases and then decreases
8. A book is lying on the table. What is the angle between the action of the book on the table and the reaction of the table on the book,
   a) 0° b) 45° c) 90° d) 180°
9. An air column in a pipe which is closed at one end, will be increase in resonance with the vibrating body of frequency 83 Hz. Then the length of the air column is
   a. 1.5 m b. 0.5 m c. 1.0 m d. 2.0 m
10. When a uniform rod is heated, which of the following quantity of the rod will Increase
    a. mass b. weight c. centre of mass d. moment of inertia
11. The escape velocity for a body projected vertically upwards from the surface of earth is 11 Km/s. If the body is projected at an angle 45° with the vertical, the escape velocity will be
    a) $11/\sqrt{2}$ Km/Sec b) 11 $\sqrt{2}$ Km/Sec c) $\sqrt{2}$ Km/Sec d) 11 Km/Sec
12. 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 %
13. If the temperature is doubled and pressure of a gas is halved, the mean free path of the gas molecules
    a. remains same b. doubled c. tripled d. quadrupled

14. The maximum speed of a particle executing SHM is 10 m/s and the maximum acceleration is 31.4 m/s^2. Its periodic time is
a. 2 s b. 4 s c. 6 s d. 1 s

15. A rope is wound around a hollow cylinder of mass 3 kg and radius 40 cm. What is the angular acceleration of the cylinder if the rope is pulled with a force of 30 N ?
a. 0.25 rad s^{-2} b. 25 rad s^{-2} c. 5 m s^{-2} d. 25 m s^{-2}

PART - II

Note : Answer any six questions. Question No 24 is compulsory : **6 x 2 = 12**

16. Define the Unit of a Physical quantity.
17. Write any two methods to reduce friction.
18. Give the relation between torque and angular momentum.
19. If an object is thrown horizontally with an initial speed 10 m/s from the top of a building of height 100 m. What is the horizontal distance covered by the stone ?
20. Why there is no lunar eclipse every month ?
21. State Hooke's law ?
22. Define the term Degrees of freedom.
23. What is an Epoch ?
24. A Nurse measured the average heart beats of a patient and reported to the doctor in terms of time period as 0.8 second. Express the heart beat of the patient in terms of number of beats measured per minute.

PART - III

Note : Answer any six questions. Question No 33 is compulsory: **6 x 3 = 18**

25. Explain Parallax method.
26. Show that the path of a projectile is a parabola in horizontal projection.
27. Derive an expression for work done by a Constant force.
28. Define Root mean square speed and Average Speed. Write its equation.
29. Define : Torque. Give any two examples of torque in day to day life.
30. Give any three applications of Viscosity.
31. Eiffel tower is made up of iron and its height is roughly 300 m. During winter season (January) in France the temperature is 2°C and in hot summer its average temperature is 25° C. Calculate the change in height of Eiffel tower between summer and winter. The linear thermal expansion of coefficient for iron is $\alpha = 10 \times 10^{-6}$ per° C.
32. State the laws of Simple pendulum.
33. Suppose we go 200 Km above and below the surface of the earth, What are the 'g' values at these two points ? In which case, is the value of 'g' small ?

PART – IV

Note : Answer all the questions : **5 x 5 = 25**

34. a. What is Satellite ? Derive an expression for time period of Satellite orbiting the Earth ? ***(OR)*** b. What is Surface tension ? Derive the relation between Surface tension and Surface energy.
35. a. Explain the different types of motions. ***(OR)*** b. Explain the need of banking of tracks.
36. a. What are the uses of dimensional analysis? Explain any one of the use? ***(OR)*** b.Derive an expression for moment of inertia of a uniform ring about an axis passing through the centre and perpendicular to the plane.
37. a. What is inelastic collision ? Derive an expression for velocity in an inelastic collision. ***(OR)*** b.Explain in detail the four different types of Oscillations.
38. a. Explain in detail Newton's law of cooling. ***(OR)*** b.Derive an expression of pressure exerted by the gas on the walls of the container.