

FIRST REVISION TEST - 2024

B

Standard XI

Reg.No.

--	--	--	--	--	--

PHYSICS

Time : 3.00 hrs

Part - I

Marks : 70

15 x 1 = 15

I. Choose the correct answer:

- If the error in the measurement of momentum of a particle is 100% then the error in the measurement of kinetic energy would be
 - 400%
 - 300%
 - 200%
 - 100%
- A particle is fired with velocity u making an angle θ with the horizontal. The change in speed, at the highest point is
 - $u \cos\theta$
 - u
 - $u \sin\theta$
 - $(u \cos\theta - u)$
- It is easier to draw up a wooden block along an inclined plane than to haul it up vertically, principally because
 - the friction is reduced
 - the mass becomes smaller
 - only a part of the weight has to be overcome
 - G becomes smaller
- During the swinging of simple pendulum
 - the work done by tension force is always zero
 - the work done by the gravitational force is zero
 - the mechanical energy of the bob remains constant in the presence of air resistance
 - the mechanical energy of the bob does not remain constant in the absence of air
- A body of mass 'a' moving with velocity 'b' strikes a body of 'c' and gets embedded into it. The velocity of the system after collision is
 - $\frac{a+c}{ab}$
 - $\frac{ab}{a+c}$
 - $\frac{a}{b+c}$
 - $\frac{b}{a+c}$
- Round off the following number 19.95 into three significant figures
 - 19.9
 - 20.0
 - 20.1
 - 19.5
- The centrifugal force appears to exist
 - only in inertial frames
 - only in rotating frames
 - in any acceleration frame
 - both in inertial and non-inertial frames
- The gravitational potential energy of the Moon with respect to Earth is
 - always positive
 - always negative
 - can be positive or negative
 - always zero
- The Young's modulus for a perfect rigid body is
 - 0
 - 1
 - 0.5
 - infinity

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. 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
12. 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 the length of the air column is
 a) 1.5 m b) 0.5 m c) 1.0 m d) 2.0 m
13. A cylindrical wire is twisted with an angle θ , what is torsion produced in it?
 a) $\frac{K}{\theta}$ b) $K\theta$ c) $\frac{K}{\theta^2}$ d) $K\theta^{1/2}$
14. Temperature of the star is determined by
 a) distance b) colour c) size d) none of these
15. The potential energy of a simple harmonic oscillator when the particle is half way to its end point is (where E is the total energy)
 a) $\frac{2}{3}E$ b) $\frac{1}{8}E$ c) $\frac{1}{4}E$ d) $\frac{1}{2}E$

Part - II

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

6 x 2 = 12

16. Moon has no atmosphere. Why?
17. Water in a bucket tied with rope is whirled around in a vertical circle of radius 0.5 m. Calculate the minimum velocity at the lowest point so that the water does not spill from it in the course of motion. ($g = 10 \text{ ms}^{-2}$)
18. Define frequency of simple harmonic motion.
19. What is Reynold's number? Give its significance.
20. Will the angular momentum of a planet be conserved? Justify your answer.
21. What is the difference between velocity and average velocity.
22. State principle of moments.
23. Compare the transverse and longitudinal waves.
24. A refrigerator has cop of 3. How much work must be supplied to the refrigerator in order to remove 200 J of heat from its interior?

Part - III

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

6 x 3 = 18

25. State the laws of simple pendulum.
26. Compare progressive waves and stationary waves.

27. Derive an expression for the elastic energy stored per unit volume of a wire.
28. Discuss conservation of angular momentum with example.
29. Derive Relation between power and velocity.
30. Two bodies of masses m and $4m$ are placed at a distance r . Calculate the gravitational potential at a point on the line joining them where the gravitational field is zero.
31. Mention the salient features of Static and Kinetic frictions.
32. Write rules for counting significant figures.
33. The resultant of two vectors A and B is perpendicular to vector A and its magnitude is equal to half of the magnitude of vector B . Find the angle between A and B .

Part - IV

IV. Answer all the following questions.

5 x 5 = 25

34. a) i) How will you measure the diameter of the Moon using Parallax method.
ii) The Moon subtends an angle of $1^{\circ}55'$ at the base line equal to the diameter of the Earth. What is the distance of the Moon from the Earth.
(Radius of the Earth is 6.4×10^6 M)
(OR)
- b) i) Explain the need for banking of tracks.
ii) Consider a circular road of radius 20 meter banked at an angle of 15 degree.
With what speed a car has to move on the turn so that it will have safe turn?
35. a) State and explain work energy principle. Mention any three examples for it.
(OR)
- b) State and prove parallel axis theorem.
36. a) Explain the variation of g with depth from the Earth's surface.
(OR)
- b) Obtain an expression for the surface tension of a liquid by capillary rise method.
37. a) Explain in detail Newton's law of cooling.
(OR)
- b) Derive the expression of pressure exerted by the gas on the walls of the container.
38. a) Describe Newton's formula for velocity of sound waves in air and also discuss the Laplace's correction.
(OR)
- b) Describe the vertical oscillations of a spring.

S. Velu MSc MEd. PhD

S.D.C. M.H.S.S.