

**Z-23-A**

Roll No.....

Total No. of Questions : 26]

[Total No. of Printed Pages : 4

11<sup>th</sup>SZARJD22

6423-A

**PHYSICS**

Time : 2.30 Hours]

[Maximum Marks : 70

(Very Very Short Answer Type Questions)

1 each

1. Evaluate :

$$\int_R^{\infty} \frac{GMm}{x^2} .dx$$

2. At which angle, the height attained by a projectile is maximum ?
3. In which collision, the colliding bodies move at certain angles before and after collision ?
4. What is the reason of weightlessness in a satellite ?
5. How many degrees of freedom are in a monoatomic gas molecule ?

(Very Short Answer Type Questions)

2 each

6. What is the dimensional formula for :

- (a) Pressure
- (b) Planck's constant ?

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Turn Over

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( 2 )

Or

Which of the following length measured is most accurate and why ?

(i) 2.0 cm

(ii) 2.00 cm

(iii) 2.000 cm

7. State the conditions under which a force does no work.
8. Define principle of calorimetry.
9. State law of equipartition of energy.
10. If a simple pendulum oscillates with an amplitude of 50 mm and time period of 2 s. Find its maximum velocity.

**(Short Answer Type Questions)**

3 each

11. State and explain work-energy principle.

Or

Briefly analyse elastic collision in two dimensions.

12. Differentiate  $e^{ax}$  by ab-initio method.
13. The frequency  $\nu$  of an oscillating drop may depend upon radius ( $r$ ) of the drop, density ( $\rho$ ) of liquid and the surface tension ( $s$ ) of the liquid. Deduce the formula dimensionally.

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14. Define uniform velocity of an object moving along a straight line. What will be the shape of position-time and velocity-time graphs of such a motion ?
15. What is a Projectile ? Define trajectory and derive equation of motion of the projectile when projected at an angle  $\theta$  with horizontal direction.
16. Why are the curved roads banked ? Obtain an expression for angle of banking of a curved road.
17. State the two theorems of moment of inertia.
18. Obtain an expression for torque in Cartesian co-ordinates.
19. Briefly discuss the limitations of first law of Thermodynamics.
20. State zeroth law of Thermodynamics. Define Temperature.
21. State the postulates of kinetic theory of gases.
22. What are transverse waves ? Give examples.

**(Value Based Questions)**

4

23. Though friction opposes relative motion, yet in certain cases, friction is also the cause of motion.
  - (i) Give one example where friction causes motion.
  - (ii) Give the direction of friction on front wheel of a bicycle when it is pedalled.
  - (iii) Friction is a necessary evil. What does this imply in day-to-day life ?

**(Long Answer Type Questions)**

5 each

24. Explain Kepler's laws of planetary motion and deduce Newton's law of gravitation from them.

*Or*

Define Escape Velocity. Derive an expression for it.

25. Define terminal velocity and derive a relation for it.

*Or*

Define capillarity and deduce ascent formula.

26. Briefly discuss the formation of standing waves in open organ pipes.

*Or*

Explain displacement, velocity, acceleration and time period in simple harmonic motions. Find the relation for them.