

Code: A-P616113-A

I SEMESTER EXAM - 2025-26

3 x 700

Std.: XI

Sub: Physics

Marks: 50

Date:

Roll No.: _____

Time: 2½ hrs

General Instructions :

- 1) **Section A :** Q. No. 1 contains 7 multiple choice type of questions carrying One mark each. Q. No. 2 contains 7 very short answer type of questions carrying One mark each.
- 2) **Section B :** Q. No. 3 to Q. No. 13 are 11 short answer type of questions carrying Two marks each. (Attempt any Eight).
- 3) **Section C :** Q. No. 14 to Q. No. 19 are 6 short answer type of questions carrying Three marks each. (Attempt any Four).
- 4) **Section D :** Q. No. 20 to Q. No. 23 are 4 long answer type of questions carrying Four marks each. (Attempt any Two).
- 5) Use of log table is allowed. Use of calculator is not allowed.

SECTION - A**Q.1 Select and write the correct answer.**

(7)

- i) S.I. unit of energy is joule and it is equivalent to
 (A) 10^6 erg (B) 10^{-7} erg
 (C) 10^7 erg (D) 10^5 erg
- ii) The resultant of two forces 10 N and 15 N acting along +X and -X axes respectively is
 (A) 25 N along + X axis (B) 25 N along - X axis
 (C) 5 N along + X axis (D) 5 N along - X axis
- iii) In case of elastic collision, which is true?
 (A) Momentum and K.E. is conserved.
 (B) Momentum conserved and K.E. not conserved.
 (C) Momentum not conserved and K.E. conserved
 (D) Momentum and K.E. both not conserved.
- iv) For a particle having a uniform circular motion, which of the following is constant
 (A) Speed (B) Velocity
 (C) Acceleration (D) Displacement
- v) For an inelastic collision, the value of e is
 (A) greater than 1 (B) less than 1
 (C) equal to 1 (D) none of these
- vi) The magnitude of scalar product of the vectors
 $\vec{A} = 2\hat{i} + 5\hat{j}$ and $\vec{B} = 3\hat{i} + 4\hat{j}$ is
 (A) 20 (B) 22
 (C) 26 (D) 29
- vii) The bob of a conical pendulum undergoes
 (A) Rectilinear motion in horizontal plane
 (B) Uniform motion in a horizontal circle
 (C) Uniform motion in a vertical circle
 (D) Rectilinear motion in vertical circle

(7)

- What are the dimensions of power?
- Define the term couple.
- Find $\vec{P} \cdot \vec{Q}$ where $\vec{P} = 2\hat{i} + \hat{j} + \hat{k}$ and $\vec{Q} = \hat{i} - \hat{j} + 2\hat{k}$
- Define the term inelastic collision.
- State the order of magnitude of electron of mass $9.1 \times 10^{-31} \text{ kg}$
- Define the term equal vectors.
- what is meant by order of magnitude?

Section - B

(16)

- Q.3** State the limitations of dimensional analysis.
- Q.4** Find unit vector parallel to the resultant of the vectors
 $\vec{A} = \hat{i} + 4\hat{j} - 2\hat{k}$ and $\vec{B} = 3\hat{i} - 5\hat{j} + \hat{k}$
- Q.5** Obtain an expression for horizontal range of projectile.
- Q.6** What is triangle law of vector addition?
- Q.7** Distinguish between elastic and inelastic collision.
- Q.8** Define significant figures. Find the number of significant figures in the following.
i) 0.1250 ii) 6.4×10^6
- Q.9** Define vector product of two vectors with suitable examples.
- Q.10** A car moves in a circle at the constant speed of 50 m/s and completes one revolution in 40s. Determine the magnitude of acceleration of the car.
- Q.11** A bullet leaves the rifle of mass one kg and the rifle recoils thereby with a velocity of 30 cm/s. If the mass of bullet is 3 g find the velocity of the bullet.
- Q.12** The masses of two bodies are measured to be 15.7 ± 0.2 kg and 27.3 ± 0.3 kg. What is the total mass of the two and error in it?
- Q.13** Distinguish between scalar product and vector product.

Section - C

(12)

- Q.14** Derive an expression for centripetal acceleration of a particle performing uniform circular motion.
- Q.15** Discuss characteristics of scalar product of two vectors.
- Q.16** Define coefficient of restitution and obtain its value for an elastic collision and a perfectly inelastic collision.
- Q.17** In Ohm's experiments, the values of the unknown resistances were found to be 6.12Ω , 6.09Ω , 6.22Ω , 6.15Ω . Calculate the (mean) absolute error, relative error and percentage error in these measurements.
- Q.18** Find the area of a triangle formed by $\vec{A} = 3\hat{i} - 4\hat{j} + 2\hat{k}$ and $\vec{B} = \hat{i} + \hat{j} - 2\hat{k}$ as adjacent sides measure in metre.
- Q.19** Derive the formula of Kinetic energy of a particle having mass 'm' and velocity 'v' using dimensional analysis.

SECTION - D**ATTEMPT ANY TWO :-****(8)**

- Q.20** Show that the path of a projectile is a parabola.
- Q.21** Explain the terms inertial and non-inertial frame of reference. Write a note on electromagnetic (EM) force.
- Q.22** Explain the use of dimensional analysis to check the correctness of the physical equation $v^2 = u^2 + 2as$
Find the conversion factor between the S.I. and C.G.S units of force using dimensional analysis.
- Q.23** State any two characteristics of the vector product (cross product) of two vectors.
Find 'a' if $\vec{A} = 3\hat{i} - 2\hat{j} + 4\hat{k}$ and $\vec{B} = a\hat{i} + 2\hat{j} - \hat{k}$ are perpendicular to one another.
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