

Code: A-P223113-A

I Semester Exam – 2024-25**3 x 890**

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 - I type of questions carrying 2 marks each. (Attempt any eight)
3. **Section-C** : Q.No. 4 to Q.No.19 are 6 short answer - II type of questions carrying 3 marks each. (Attempt any four)
4. **Section-D** : Q.No. 20 to Q.No. 23 are 4 long answer type of questions carrying four mark each. (Attempt any two)
5. Use of Logarith Tables is allowed.
Use of calculator is not allowed.

Section - A**Q.1 Select and write the correct answer.****7**

- i) Which of the following is not a fundamental unit?
A) cm B) kg C) centigrade D) volt
- ii) $[L^1M^1T^{-2}]$ is the dimensional formula for _____
(A) velocity (B) acceleration (C) force (D) work
- iii) 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
- iv) A projectile is thrown with an initial velocity of 50 m/s. The maximum horizontal distance which this projectile can travel is _____
(A) 64 m (B) 128 m (C) 5 m (D) 255 m
- (v) 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.
- (vi) The angle of dip at the equator is
(A) 90° (B) 45° (C) 30° (D) 0°
- (vii) If an increase in length of copper wire is 0.5% due to stretching, the percentage increase in its resistance will be
(A) 0.1% (B) 0.2% (C) 1% (D) 2%

Q.2 Answer the following.**7**

- i) What is personal error?
- ii) Explain unit vector.
- iii) A particle moves in a circle with constant speed of 15 m/s. The radius of the circle is 2 m. Determine the centripetal acceleration of the particle.
- iv) Define the term couple.
- v) A bar magnet of magnetic moment 5.0 Am² has the poles 20 cm apart. Calculate the pole strength.
- vi) What is a geographic meridian?
- vii) State ohm's law.

P.T.O

Section - B**Attempt any Eight****16**

- Q.3** 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 the error in it?
- Q.4** Find unit vector parallel to the resultant of the vectors $= \vec{V}_1 = \hat{i} + 4\hat{j} - 2\hat{k}$ and $\vec{V}_2 = 3\hat{i} - 5\hat{j} + \hat{k}$
- Q.5** Find the scalar product of the two vectors $\vec{V}_1 = \hat{i} + 2\hat{j} + 3$ and $\vec{V}_2 = 3\hat{i} + 4\hat{j} - 5\hat{k}$
- Q.6** A car moves in a circle at the constant speed of 50 m/s and completes one revolution in 40 s. Determine the magnitude of acceleration of the car.
- Q.7** Define temperature coefficient of resistance and state its unit.
- Q.8** Obtain an expression for the horizontal range of a projectile.
- Q.9** The mass of moon is 0.0123 times the mass of the earth and separation between them is 3.84×10^8 m. Determine the location of C.M as measured from the centre of the earth.
- Q.10** Define coefficient of restitution. State its value in case of a elastic, perfectly elastic and perfectly inelastic collision.
- Q.11** Define magnetic flux. State its SI unit.
- Q.12** State properties of magnetic lines of force.
- Q.13** Explain parallel combination of resistors.

Section - C**Attempt any Four.****12**

- Q.14** A battery of emf 12 V and internal resistance 3Ω is connected to a resistor. If the current in the circuit is 0.5 A.
- Calculate resistance of resistor,
 - Calculate terminal voltage of the battery when the circuit is closed.
- Q.15** 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.16** What are rectangular components of vectors? Explain their uses.
- Q.17** A body is projected with a velocity of 30 m/s at an angle of 30° with the vertical. Find the (i) maximum height (ii) time of flight (iii) the horizontal range
- Q.18** Define (a) ohm resistance (b) Drift velocity (c) Current density
- Q.19** In case of an elastic head on collision between two bodies, derive an expression for the final velocities of the bodies in terms of their masses and velocities before collision.

Section - D**Attempt any Two****8**

- Q.20** Explain the terms:
- Arithmetic mean
 - Relative Error
- State any two characteristics of the vector product (cross product) of two vectors.

Q.21 What is a conical pendulum? Show that its time period is given by $2\pi \sqrt{\frac{L \cos \theta}{g}}$

Where L is the length of the string, θ is the angle that the string makes with the vertical and g is the acceleration due to gravity.

Q.22 Distinguish between elastic and inelastic collision.

Distinguish between moment of a force and moment of a couple.

Q.23 Define magnetic declination. How does the declination vary with latitude? Where is it minimum?

A bar magnet has magnetic moment 3.6 Am^2 and pole strength 10.8 Am . Determine its magnetic length and geometric length.
