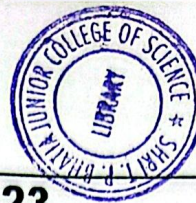


X1 Sol (1)



Code: A-P337113-M

I Semester Exam – 2022-23

3 x 810

Std.: XI

Sub: PHYSICS

Marks: 50

Date: 21/11/2022

Roll No.: _____

Time: 2½ Hrs.

General Instructions :

- 1) Section A : Q. No. 1 contains 7 multiple choice type questions carrying one mark each.
Q. No. 2 contains 7 very short answer type questions carrying one mark each.
- 2) Section B : Q. No. 3 to Q. No. 13 are 11 short answer - I type questions carrying 2 mark each (attempt any eight)
- 3) Section C : Q. No. 4 to Q. No. 19 are 6 short answer-II type questions carrying 3 marks each (Attempt any four)
- 4) Section D : Q. No. 20 to Q. No. 23 are 4 long answer type questions carrying four marks each. (Attempt any two)
- 5) Use of Logarithm Tables is allowed.
Use of calculator is not allowed.

Section - A

Q. 1 Select and write the correct answer.

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- i) The ratio of magnetic field along the axis to magnetic field along the equator of a magnet is _____
a) 1:1
b) 1:2
c) 2:1
d) 4:1
- ii) $R_1 = 5 \Omega$, $R_2 = 5 \Omega$ connected in parallel combination, $R_p = ?$
a) 2.5Ω
b) 20Ω
c) 5.2Ω
d) 10Ω
- iii) Time taken by the projectile to cover entire trajectory is known as
a) time of ascent
b) periodic time
c) time of decent
d) time of flight
- iv) The process of splitting up a vector into two or more components whose combined effect is same as original vector,
a) resolution of vectors
b) composition of vectors
c) Triangle law of vectors.
- v) Which of the following is 'not' a unit of energy.
a) watt. hour
b) calorie
c) Megawatt
d) electron. volt.
- vi) The magnitude of the scalar product of two unit vector perpendicular to each other is _____
a) zero
b) 1
c) -1
d) 2
- vii) The maximum horizontal range of the projectile moving with initial velocity is given by
a) $R_{\max} = \frac{u^2}{g}$
b) $R_{\max} = \frac{2u^2}{g}$
c) $R_{\max} = \frac{g}{u^2}$
d) $R_{\max} = \frac{g}{2u^2}$

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Q.2 Answer the following :

7

- i) Define magnetic axis.
- ii) Find value of resistance for the following colour code.
Blue Green Red Gold
- iii) Define angular velocity.
- iv) Define vector product of two vectors.
- v) The error in the measurement of the sides of a rectangle is 1% The error in the measurement of area is _____ ?
- vi) What is S.I unit of magnetic flux?
- vii) Define unit vector.

Section - B**Attempt any eight.**

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- Q. 3** State triangle law of vector addition.
- Q. 4** Derive the formula for 'Kinetic energy' of a particle having mass 'm' and velocity 'v' using dimensional analysis.
- Q. 5** If $\vec{V}_1 = 3\hat{i} + 4\hat{j} + \hat{k}$ and $\vec{V}_2 = \hat{i} - \hat{j} - \hat{k}$ determine the magnitude of $\vec{V}_1 + \vec{V}_2$.
- Q. 6** Explain any two types of error involved in the measurement of physical quantities.
- Q. 7** The heating element connected to 230 volt draws a current of 5A. Determine the amount of heat dissipated in 1 hour ($J = 4.2 \text{ J / cal}$)
- Q. 8** Define magnetic meridian and magnetic declination.
- Q. 9** Find the angle between $\vec{A} = 4\hat{i} + \hat{j} + 3\hat{k}$ and $\vec{B} = \hat{i} - 3\hat{j} + 4\hat{k}$.
- Q. 10** Define centripetal force and radius vector.
- Q. 11** Define temperature coefficient of resistance.
- Q. 12** Write an equation of trajectory of projectile in projectile motion.
- Q. 13** The pole strength (q_m) of a magnetic dipole is 25 A.m and its magnetic length (2l) is 20cm then find out its magnetic moment.

Section - C**Attempt any four.**

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- Q. 14** A body tied to one end of a string is revolved in a horizontal circle of radius 50 cm with a constant angular speed of 20 rad/s. Find the time period and linear speed.
- Q. 15** Derive the expression for range in projectile motion.
- Q. 16** Prove that the current density of a metallic conductor is directly proportional to the drift speed of electron.
- Q. 17** Calculate the magnitude of the magnetic field due to a short magnet of magnetic moment 5 A m^2 at 5 cm from its centre along its axis.
- Q. 18** State the characteristic of scalar product.
- Q. 19** Define
 - a) One ohm resistance
 - b) Drift velocity
 - c) current density

Section - D

8

Attempt any two :

- Q. 20** a) Obtain the expression for the centripetal acceleration of a particle performing uniform circular motion.
b) A man throws a ball to maximum horizontal distance of 80 m. Calculate the maximum height reached.
- Q. 21** a) Define plane angle and solid angle.
b) In ohm's Experiment the values of the unknown resistance were round to the 6.12Ω , 6.09Ω , 6.22Ω , 6.15Ω . Calculate the absolute error and relative error.
- Q. 22** State parallelogram law of vector addition with help of neat labeled diagram, Hence determine the magnitude and direction of resultant vector.
- Q. 23** Derive an expression for the magnitude of magnetic field at an arbitrary point due to a bar magnet.
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