

Section-B
(Short Answer)

Note: Answer any EIGHT of the following questions. Each question carries 05 marks.

- Q.2 Find the work done in moving an object along a vector $\vec{r} = 3\hat{i} + 2\hat{j} - 5\hat{k}$ if the applied force is $\vec{F} = 2\hat{i} - \hat{j} - \hat{k}$.
- Q.3 Show that expression $v_f^2 = v^2 - 2aS$ is dimensionally correct.
- Q.4 Write the advantages and disadvantages of friction.
- Q.5 Under what conditions torque acting on a body will be zero?
- Q.6 Would there be any effect on "g". If the value of "G" is doubled?
- Q.7 In a sonometer by what change in linear density of wire its velocity becomes double? Keeping tension of wire constant.
- Q.8 Determine the position, size and nature of image formed by convex lens at three different position of object. Illustrate the ray diagram.
- Q.9 If \vec{r}_1 and \vec{r}_2 are the position vectors (Both lies in X, Y plane) making an angles 45° and 75° with +ve x-axis measured counter clockwise, estimate their cross product if $|\vec{r}_1| = 10\text{cm}$ and $|\vec{r}_2| = 16\text{cm}$.
- Q.10 A 2000 Kg truck travelling at 54 km/hr on the application of break it comes to rest by covering 37.5 meters. Calculate average retarding force of break.
- Q.11 What is the take off speed of a locust if its launch angle is 55° and its range is 0.8 m?
- Q.12 What do you mean by plane polarized light? How does the phenomena decide that light waves are transverse?
- Q.13 A Galilean telescope has an objective of 120 mm focal length and an eye piece of 50 mm focal length. If image seen by a eye place is 300 mm from the eye place what is its angular magnification.

Section-C Descriptive Answer)

Note: Answer any TWO of the following question.

- Q.14(a) Write the assumptions of projectile motion, deduce the formula for range of projectile. At what elevations projectile having same range?
- (b) Prove that the work doen in gravitational field is indepent of path following by a body
- Q.15(a) Define Simple Pendulum. Show that the motion of Pendulum is simple harmonic and calculate its time period.
- (b) Derive an expression for acceleration fo a body moving down on inclined plane.
- Q.16. (a) Write the notes on any TWO of the following:
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| (i) Dot product of two vectros with properties | (ii) Newton's laws of motion |
| (iii) Michelson interferometer | (iv) Compound microscope |