



ASSIGNMENT NO 2

SUBJECT PHYSICS

CLASS-XITH

JULY'2026

1. Two vectors, both equal in magnitude, have their resultant equal in magnitude of the either. Find the angle between the two vectors.

OR

Two equal forces have their resultant equal to either. What is the inclination between them?

Ans: 120°

2. Two forces whose magnitudes are in the ratio of 3:5 give a resultant of 35 N. If the angle of inclination be 60° , calculate the magnitude of each force.

Ans: 15 N, 25 N.

3. Two forces equal to P and 2 P newton act on a particle. If the first be doubled and the second be increased by 20 N, the direction of the resultant is unaltered. Find the value of P.

Ans: 10 N.

4. The sum of the magnitudes of two forces acting at a point is 18 N and the magnitude of their resultant is 12 N. If the resultant makes an angle of 90° with the force of smaller magnitude, what are the magnitudes of the two forces?

Ans: 5N, 13 N.

5. Two equal forces have the square of their resultant equal to three times their product. Find the angle between them.

Ans: 60°

6. If $|\vec{A} + \vec{B}| = |\vec{A}| + |\vec{B}|$, then find the angle between $\vec{A}$ and $\vec{B}$.

7. Find unit vector parallel to the resultant of the vector $\vec{A} = \hat{i} + 4\hat{j} - 2\hat{k}$ and $\vec{B} = 3\hat{i} - 5\hat{j} + \hat{k}$.

8. Find the components of $\vec{a} = 2\hat{i} + 3\hat{j}$ along the directions of vectors $\hat{i} + \hat{j}$ and $\hat{i} - \hat{j}$.

9. A motorboat is racing towards north at 25 km/h and the water current in that region is 10 km/h in the direction of 60° east of south. Find the resultant velocity of the boat.

10. The position of a particle is given by $\vec{r} = 3.0 t \hat{i} - 2.0 t^2 \hat{j} + 4.0 \hat{k}$ m

Where t is in seconds and the coefficients have the proper units for $\vec{r}$ to be in meters.

(i) Find the $\vec{v}$ and $\vec{a}$ of the particle. (ii) What is the magnitude and direction of velocity of the particle at t= 2 sec?

11. A particle starts from origin at t = 0 with a velocity 10.0 j m/s and moves in x-y plane under action of a force which produces a constant acceleration of $(8\hat{i} + 2\hat{j})$ m/s² (a) At what time is the x- coordinate of the particle 16 m? What is the y-coordinate of the particle at that time? (b) What is the speed of the particle at the time?

12. A particle starts from origin at $t = 0$ with a velocity $5.0 \hat{i}$ m/s and moves in x-y plane under action of a force which produces a constant acceleration of $(3\hat{i} + 2\hat{j})$ m/s² (a) What is the y-coordinate of the particle at the instant its x-coordinate is 84 m? (b) What is the speed of the particle at this time?

Ans:(a) 36 m (b) 26 m/s

13. From the top of a tower 156.8 m high a projectile is projected with a velocity of 39.2 ms^{-1} in a direction making an angle 30° with horizontal. Find the distance from the foot of tower where it strikes the ground and time taken to do so.

14. A stone tied to the end of a string 80 cm long is whirled in a horizontal circle with a constant speed. If the stone makes 14 revolutions in 25 s, what is the magnitude and direction of acceleration of the stone?

15. An insect trapped in a circular groove of radius 12 cm moves along the groove steadily and completes 7 revolutions in 100 s. (a) What is the angular speed, and the linear speed of the motion? (b) Is the acceleration vector a constant vector? What is its magnitude?

16. A cricket ball is thrown at a speed of 28 m/s in a direction 30° above the horizontal. Calculate (a) the maximum height, (b) the time taken by the ball to return to the same level, and (c) the distance from the thrower to the point where the ball returns to the same level.

Ans:(a) 10 m (b) 2.9 s (c) 69 m

17. The ceiling of a long hall is 25 m high. What is the maximum horizontal distance that a ball thrown with a speed of 40 m/s can go without hitting the ceiling of the hall?

Ans:(a) 150.33 m

18. A cricketer can throw a ball to a maximum horizontal distance of 100 m. How much high above the ground can the cricketer throw the same ball?

19. From the top of a tower 156.8 m high a projectile is projected with a velocity of 39.2 ms^{-1} in a direction making an angle 30° with horizontal. Find the distance from the foot of tower where it strikes the ground and time taken to do so.

20. A body is projected with a velocity of 30 ms^{-1} at an angle of 30° with the vertical. Find the maximum height, time of flight and the horizontal range.