

## SCALAR AND VECTOR Assignment No 1

- 1) The vector projection of a vector  $3\hat{i} + 4\hat{k}$  on  $y$ -axis is [RPMT 2004]
- (a) 5 (b) 4  
(c) 3 (d) Zero
- 2) Position of a particle in a rectangular-co-ordinate system is (3, 2, 5). Then its position vector will be
- (a)  $3\hat{i} + 5\hat{j} + 2\hat{k}$  (b)  $3\hat{i} + 2\hat{j} + 5\hat{k}$   
(c)  $5\hat{i} + 3\hat{j} + 2\hat{k}$  (d) None of these
- 3) If a particle moves from point  $P$  (2,3,5) to point  $Q$  (3,4,5). Its displacement vector be
- (a)  $\hat{i} + \hat{j} + 10\hat{k}$  (b)  $\hat{i} + \hat{j} + 5\hat{k}$   
(c)  $\hat{i} + \hat{j}$  (d)  $2\hat{i} + 4\hat{j} + 6\hat{k}$
- 4) A force of 5 N acts on a particle along a direction making an angle of  $60^\circ$  with vertical. Its vertical component be
- (a) 10 N (b) 3 N  
(c) 4 N (d) 2.5 N
- 5) If  $A = 3\hat{i} + 4\hat{j}$  and  $B = 7\hat{i} + 24\hat{j}$ , the vector having the same magnitude as  $B$  and parallel to  $A$  is
- (a)  $5\hat{i} + 20\hat{j}$  (b)  $15\hat{i} + 10\hat{j}$   
(c)  $20\hat{i} + 15\hat{j}$  (d)  $15\hat{i} + 20\hat{j}$
- 6) The vector that must be added to the vector  $\hat{i} - 3\hat{j} + 2\hat{k}$  and  $3\hat{i} + 6\hat{j} - 7\hat{k}$  so that the resultant vector is a unit vector along the  $y$ -axis is
- (a)  $4\hat{i} + 2\hat{j} + 5\hat{k}$  (b)  $-4\hat{i} - 2\hat{j} + 5\hat{k}$   
(c)  $3\hat{i} + 4\hat{j} + 5\hat{k}$  (d) Null vector

- 7) The expression  $\left(\frac{1}{\sqrt{2}}\hat{i} + \frac{1}{\sqrt{2}}\hat{j}\right)$  is a
- (a) Unit vector (b) Null vector  
(c) Vector of magnitude  $\sqrt{2}$  (d) Scalar
- 8) Given vector  $\vec{A} = 2\hat{i} + 3\hat{j}$ , the angle between  $\vec{A}$  and  $y$ -axis is
- (a)  $\tan^{-1} 3/2$  (b)  $\tan^{-1} 2/3$   
(c)  $\sin^{-1} 2/3$  (d)  $\cos^{-1} 2/3$
- 9) The unit vector along  $\hat{i} + \hat{j}$  is
- (a)  $\hat{k}$  (b)  $\hat{i} + \hat{j}$   
(c)  $\frac{\hat{i} + \hat{j}}{\sqrt{2}}$  (d)  $\frac{\hat{i} + \hat{j}}{2}$
- 10) A vector is represented by  $3\hat{i} + \hat{j} + 2\hat{k}$ . Its length in  $XY$  plane is
- (a) 2 (b)  $\sqrt{14}$   
(c)  $\sqrt{10}$  (d)  $\sqrt{5}$
- 11) Which of the following is a scalar quantity
- (a) Displacement (b) Electric field  
(c) Acceleration (d) Work
- 12) If a unit vector is represented by  $0.5\hat{i} + 0.8\hat{j} + c\hat{k}$ , then the value of 'c' is
- (a) 1 (b)  $\sqrt{0.11}$   
(c)  $\sqrt{0.01}$  (d)  $\sqrt{0.39}$
- 13) A boy walks uniformly along the sides of a rectangular park of size  $400\text{ m} \times 300\text{ m}$ , starting from one corner to the other corner diagonally opposite. Which of the following statement is incorrect
- (a) He has travelled a distance of  $700\text{ m}$   
(b) His displacement is  $700\text{ m}$   
(c) His displacement is  $500\text{ m}$   
(d) His velocity is not uniform throughout the walk
- The unit vector parallel to the resultant of the vectors
- 14)  $\vec{A} = 4\hat{i} + 3\hat{j} + 6\hat{k}$  and  $\vec{B} = -\hat{i} + 3\hat{j} - 8\hat{k}$  is
- (a)  $\frac{1}{7}(3\hat{i} + 6\hat{j} - 2\hat{k})$  (b)  $\frac{1}{7}(3\hat{i} + 6\hat{j} + 2\hat{k})$   
(c)  $\frac{1}{49}(3\hat{i} + 6\hat{j} - 2\hat{k})$  (d)  $\frac{1}{49}(3\hat{i} - 6\hat{j} + 2\hat{k})$