EXERCISE – I (Conceptual Questions) Build Up Your Understanding

TRIGONOMETRY

1. As θ increases from 0º to 90º, the value of cosθ :-

(1) Increases (2) Decreases

(3) Remains constant (4) First decreases than increases.

2. The greatest value of the function $-5\sin\theta + 12\cos\theta$ is

(1) 12 (2) 13 (3) 7 (4) 17

3. If $\tan\theta = \frac{1}{\sqrt{5}}$ and θ lies in the first quadrant, the value of cosθ is :

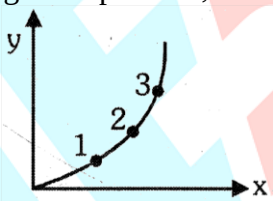
(1) $\sqrt{\frac{5}{6}}$ (2) $-\sqrt{\frac{5}{6}}$ (3) $\frac{1}{\sqrt{6}}$ (4) $-\frac{1}{\sqrt{6}}$

CALCULUS

4. The coordinates of a particle moving in XY-plane vary with time as $x = 4t^2$; $y = 2t$. The locus of the particle is a :-

(1) Straight line (2) Circle (3) Parabola (4) Ellipse

5. The slope of graph as shown in figure at points 1, 2 and 3 is m_1, m_2 and m_3 respectively then



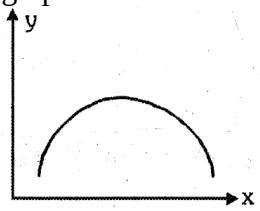
(1) $m_1 > m_2 > m_3$ (2) $m_1 < m_2 < m_3$ (3) $m_1 = m_2 = m_3$ (4) $m_1 = m_3 > m_2$

6. A particle moves along the straight line $y = 3x + 5$. Which coordinate changes at a faster rate?

(1) x-coordinate (2) y-coordinate

(3) Both x and y coordinates (4) Data insufficient.

7. Magnitude of slope of the shown graph.



(1) First increases then decreases (2) First decrease then increases

(3) Increases (4) Decreases

GEOMETTY

8. The equation of a curve is given as $y = x^2 + 2 - 3x$.

The curve intersects the x-axis at

(1) (1, 0) (2) (2, 0) (3) Both (1) and (2) (4) No where

9. Two particles A and B are moving in XY-plane. Their positions vary with time t according to relation:

$x_A(t) = 3t$, $x_B(t) = 6$

$y_A(t) = t$, $y_B(t) = 2 + 3t^2$

Distance between two, particles at t = 1 is :

(1) 5 (2) 3 (3) 4 (4) $\sqrt{12}$

10. A particular straight line passes through origin and a point whose abscissa 'is double of ordinate of the point. The equation of such straight line is:

(1) $y = \frac{x}{2}$ (2) $y = 2x$ (3) $y = -4x$ (4) $y = -\frac{x}{4}$

11. The side of a square is increasing at the rate of 0.2 cm/s. The rate of increase of perimeter w.r.t. time is:

(1) 0.2 cm/s (2) 0.4 cm/s (3) 0.6 cm/s (4) 0.8 cm/s

12. Frequency f of a simple pendulum depends on its length λ and acceleration g due to gravity according to the following equation: $f = \frac{1}{2\pi}\sqrt{\frac{g}{l}}$. Graph between which of the following quantities is a straight line?

(1) f on the ordinate and λ on the abscissa .

(2) f on the ordinate and $\sqrt{l}$ on the abscissa

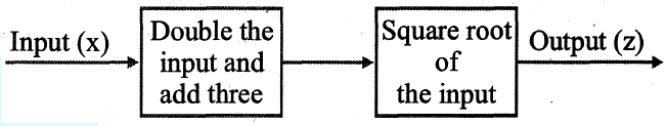
(3) f^2 on the ordinate and λ on the abscissa

(4) f^2 on the ordinate and l / λ on the abscissa

13. The sum of the series $1+\frac{1}{4}+\frac{1}{16}+\frac{1}{64}+\ldots\ldots\infty$ is

(1) $\frac{8}{7}$ (2) $\frac{6}{5}$ (3) $\frac{5}{4}$ (4) $\frac{4}{3}$

14. In the given figure, each box represents a function machine. A function machine illustrates what it does with the input.



Which of the following statements is correct?

(1) z = 2x + 3 (2) z = 2(x + 3) (3) $z = \sqrt{2x+3}$ (4) $z = \sqrt{2(x+3)}$

DEFINITION & TYPES OF VECTOR

15. Which of the following statements is false :

(1) Mass, speed and energy are scalars

(2) Momentum, force and torque are vectors

(3) Distance is a scalar while displacement is a vector

(4) A vector has only magnitude whereas as a scalar has both magnitude and direction

16. If $\hat{n}$ is a unit vector in the direction of the vector $\vec{A}$, then :-

(1) $\hat{n} = \frac{\vec{A}}{|\vec{A}|}$ (2) $\hat{n} = \vec{A}|\vec{A}|$ (3) $\hat{n} = \frac{|\vec{A}|}{\vec{A}}$ (4) None of the above

17. A physical quantity which has a direction:

(1) must be a vector (2) may be a vector (3) must be a scalar (4) none of the above

18. Which of the following physical quantities is an axial vector?

(1) displacement (2) force (3) velocity (4) forque

19. The forces, which meet at one point but their lines of action do not lie in one plane, are called:

(1) non-coplanar and non-concurrent forces (2) coplanar and non-concurrent forces
(3) non-coplanar and concurrent forces (4) coplanar and concurrent forces

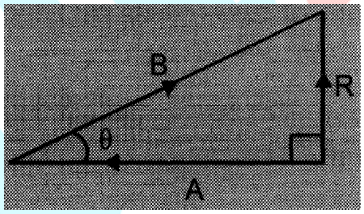
20. The direction of the angular velocity vector is along:

(1) Along the tangent of circular path (2) Along the direction of radius vector
(3) Opposite to the direction of radius vector (4) Along the axis of rotation

21. Two vectors $\vec{A}$ and $\vec{B}$ lie in a plane, another vector $\vec{C}$ lies outside this plane, then the resultant of these three vectors i.e. $\vec{A}+\vec{B}+\vec{C}$:

(1) can be zero (2) connot be zero
(3) lies in the plane containing $\vec{A}$ & $\vec{B}$ (4) lies in the plane containing $\vec{B}$ & $\vec{C}$

22. In vector diagram shown in figure where $(\vec{R})$ is the resultant of vectors $(\vec{A})$ and $(\vec{B})$.



If $R = \frac{B}{\sqrt{2}}$, then value of angle θ is :

(1) 30º (2) 45º (3) 60º (4) 75º

23. The resultant of $\vec{A}$ and $\vec{B}$ make an angle α with $\vec{A}$ and β with $\vec{B}$, then :

(1) $\alpha < \beta$ (2) $\alpha < \beta$ if $A < B$ (3) $\alpha < \beta$ if $A > B$ (4) $\alpha < \beta$ if $A = B$

25. Two vectors $\vec{A}$ and $\vec{B}$ are such that $\vec{A}+\vec{B}=\vec{C}$ and $A^2 + B^2 = C^2$. Which of the following statements, is correct?

(1) $\vec{A}$ is parallel to $\vec{B}$ (2) $\vec{A}$ is anti-parallel to $\vec{B}$
(3) $\vec{A}$ is perpendicular to $\vec{B}$ (4) $\vec{A}$ and $\vec{B}$ are equal in magnitude

25. The minimum number of vectors of equal magnitude required to produce a zero resultant is :

(1) 2 (2) 3 (3) 4 (4) more than 4

26. How many minimum number of coplanar vectors having different magnitudes can be added to give zero resultant?
(1) 2 (2) 3 (3) 4 (4) 5

27. How many minimum number of vectors in different planes can be added to give zero resultant?
(1) 2 (2) 3 (3) 4 (4) 5

28. What is the maximum number of components into which a vector can be split?
(1) 2 (2) 3 (3) 4 (4) Infinite

29. What is the maximum number of rectangular components into which a vector can be split in its own plane?
(1) 2 (2) 3 (3) 4 (4) Infinite

30. What is the maximum number of rectangular components into which a vector can be split in space?
(1) 2 (2) 3 (3) 4 (4) Infinite

31. The vector sum of the forces of 10 newton and 6 newton can be :
(1) 2N (2) 8N (3) 18N (4) 20N

32. Vector sum of two forces of 10N and 6N cannot be:
(1) 4N (2) 8N (3) 12N (4) 2N

33. Which of the following pair of forces will never give a resultant force of 2 N ?
(1) 2 N and 2 N (2) 1 N and 1 N (3) 1 N and 3 N (4) 1 N and 4 N

34. If $\vec{A}+\vec{B}=\vec{C}$ and A+ B = C, then the angle between $\vec{A}$ and $\vec{B}$ is :
(1) 0 (2) $\frac{\pi}{4}$ (3) $\frac{\pi}{2}$ (4) π

35. The resultant of $\vec{A}$ & $\vec{B}$ is $\vec{R}_1$. On reversing the vector $\vec{B}$, the resultant becomes $\vec{R}_2$. What is the value of $R_1^2+R_2^2$?
(1) $A^2 + B^2$ (2) $A^2 - B^2$ (3) $2(A^2 + B^2)$ (4) $2(A^2 - B^2)$

36. Given that $\vec{P}+\vec{Q}=\vec{P}-\vec{Q}$. This can be true when:
(1) $\vec{P}=\vec{Q}$ (2) $\vec{Q}=\vec{0}$ -
(3) Neither $\vec{P}$ nor $\vec{Q}$ is a null vector (4) $\vec{P}$ is perpendicular to $\vec{Q}$

37. Which of the following sets of concurrent forces may be in equilibrium?
(1) F_1 = 3N, F_2 = 5N, F_3 = 1N (2) F_1 = 3N, F_2 = 5N, F_3 = 9N
(3) F_1 = 3N, F_2 = 5N, F_3 = 6N (4) F_1 = 3N, F_2 = 5N, F_3= 15N

38. If vectors $\vec{A}$ and $\vec{B}$ are such that $|\vec{A}+\vec{B}|=|\vec{A}|=|\vec{B}|$, then $|\vec{A}-\vec{B}|$ may be equated to

(1) $\frac{\sqrt{3}}{2}\left|\vec{A}\right|$ (2) $\left|\vec{A}\right|$ (3) $\sqrt{2}\left|\vec{A}\right|$ (4) $\sqrt{3}\left|\vec{A}\right|$

39. What happens, when We multiply a vector by (–2) ?
(1) direction reverses and unit changes
(2) direction reverses and magnitude is doubled
(3) direction remains unchanged and unit changes
(4) none of these

40. Two vectors of equal magnitude have a resultant equal to either of them in magnitude. The angle between them is :
(1) 60° (2) 90° (3) 105° (4) 120°

41. If the sum of two unit vectors is a unit vector, then the magnitude of their difference is :
(1) $\sqrt{2}$ (2) $\sqrt{3}$ (3) $\frac{1}{\sqrt{2}}$ (4) $\sqrt{5}$

RESOLUTION OF VECTOR

42. If a unit vector is represented by $0.5\hat{i}+0.8\hat{j}+c\hat{k}$ then the value of 'c' is :
(1) 1 (2) $\sqrt{0.11}$ (3) $\sqrt{0.01}$ (4) $\sqrt{0.39}$

43. Vector $\vec{P}$ makes angles α, β & γ with the X, Y and zaxes respectively, then $\sin^2\alpha + \sin^2\beta + \sin^2\gamma =$
(1) 0 (2) 1 (3) 2 (4) 3

44. The direction cosines of a vector $\hat{i}+\hat{j}+\sqrt{2}\hat{k}$ are :-
(1) $\frac{1}{2},\frac{1}{2},1$ (2) $\frac{1}{\sqrt{2}},\frac{1}{\sqrt{2}},\frac{1}{2}$ (3) $\frac{1}{2},\frac{1}{2},\frac{1}{\sqrt{2}}$ (4) $\frac{1}{\sqrt{2}},\frac{1}{\sqrt{2}},\frac{1}{\sqrt{2}}$

45. The unit vector along $\hat{i}+\hat{j}$ is :
(1) $\hat{k}$ (2) $\hat{i}+\hat{j}$ (3) $\frac{\hat{i}+\hat{j}}{\sqrt{2}}$ (4) $\frac{\hat{i}+\hat{j}}{2}$

46. The unit vector parallel to the resultant of the vectors $\vec{A}=4\hat{i}+3\hat{j}+6\hat{k}$ = $\vec{B}=-\hat{i}+3\hat{j}+8\hat{k}$ is:
(1) $\frac{1}{7}\left[3\hat{i}+6\hat{j}-2\hat{k}\right]$ (2) $\frac{1}{7}\left[3\hat{i}+6\hat{j}+2\hat{k}\right]$ (3) $\frac{1}{49}\left[3\hat{i}+6\hat{j}+2\hat{k}\right]$ (4) $\frac{1}{7}\left[3\hat{i}+6\hat{j}-2\hat{k}\right]$

47. If $\vec{A}+\vec{B}$ is a unit vector along x-axis and $\vec{A}=\hat{i}-\hat{j}+\hat{k}$, then what is $\vec{B}$?
(1) $\hat{j}+\hat{k}$ (2) $\hat{j}-\hat{k}$ (3) $\hat{i}+\hat{j}+\hat{k}$ (4) $\hat{i}+\hat{j}-\hat{k}$

48. Forces 3N, 4N and 12N act at a point in mutually perpendicular directions. The magnitude of the resultant force is :
(1) 19 N (2) 13 N (3) 11 N (4) 5 N

49. The angle that the vector $\vec{A}=2\hat{i}+3\hat{j}$ makes with y-axis is:

(1) $\tan^{-1}(3/2)$ (2) $\tan^{-1}(2/3)$ (3) $\sin^{-1}(2/3)$ (4) $\cos^{-1}(3/2)$

DOT PRODUCT

50. What is the angle between $\vec{A}$ and the resultant of $(\vec{A}+\vec{B})$ and $(\vec{A}-\hat{B})$?

(1) 0° (2) $\tan^{-1}\left(\frac{A}{B}\right)$ (3) $\tan^{-1}\left(\frac{B}{A}\right)$ (4) $\tan^{-1}\left(\frac{A-B}{A+B}\right)$

51. If $\hat{n}=a\hat{i}+b\hat{j}$ is perpendicular to the vector $\left(\hat{i}+\hat{j}\right)$, then the value of a and b may be :

(1) 1, 0 (2) –2, 0 (3) 3, 0 (4) $\frac{1}{\sqrt{2}},-\frac{1}{\sqrt{2}}$

52. Given that A = B. What is the angle between $(\vec{A}+\vec{B})$ and $(\vec{A}-\vec{B})$?

(1) 30° (2) 60° (3) 90º (4) 180°

53. The vector sum of two forces is perpendicular to their vector difference. In that case, the force:

(1) Are equal to each other. (2) Are equal to each other in magnitude.

(3) Are not equal to each other in magnitude (4) Cannot be predicted.

54. The magnitudes of vectors $\vec{A}$, $\vec{B}$ and $\vec{C}$ are respectively 12, 5 and 13 units and $\vec{A}+\vec{B}=\vec{C}$, then the angle between $\vec{A}$ and $\vec{B}$ is :

(1) 0 (2) π / 3 (3) π / 2 (4) π / 4

55. If vectors $\vec{P}$, $\vec{Q}$ and $\vec{R}$ have magnitudes 5, 12 and 13 units and $\vec{P}+\vec{Q}=\vec{R}$, the angle between $\vec{Q}$ and $\vec{R}$ is:

(1) $\cos^{-1}\left(\frac{5}{12}\right)$ (2) $\cos^{-1}\left(\frac{5}{13}\right)$ (3) $\cos^{-1}\left(\frac{12}{13}\right)$ (4) $\cos^{-1}\left(\frac{2}{13}\right)$

56. A vector perpendicular to $\left(4\hat{i}-3\hat{j}\right)$ may be :

(1) $4\hat{i}+3\hat{j}$ (2) $7\hat{k}$ (3) $6\hat{i}$ (4) $3\hat{i}-4\hat{j}$

57. A force $\left(3\hat{i}+2\hat{j}\right)$N displaces an object through a distance $\left(2\hat{i}-3\hat{j}\right)$ m. The work $(W=\vec{F}\cdot\vec{S})$ done is :

(1) zero (2) 12 J (3) 5 J (4) 13 J

58. If $\vec{P}\cdot\vec{Q}=PQ$, then angle between $\vec{P}$ and $\vec{Q}$ is:

(1) 0° (2) 30° (3) 45° (4) 60°

59. The resultant of $\vec{A}$ and $\vec{B}$ is perpendicular to $\vec{A}$.
What is the angle between $\vec{A}$ and $\vec{B}$?

(1) $\cos^{-1}\left(\frac{A}{B}\right)$ (2) $\cos^{-1}\left(-\frac{A}{B}\right)$ (3) $\sin^{-1}\left(\frac{A}{B}\right)$ (4) $\sin^{-1}\left(-\frac{A}{B}\right)$

60. What is the component of $\left(3\hat{i}+4\hat{j}\right)$ along $\left(\hat{i}+\hat{j}\right)$?

(1) $\frac{1}{2}\left(\hat{j}+\hat{i}\right)$ (2) $\frac{3}{2}\left(\hat{j}+\hat{i}\right)$ (3) $\frac{5}{2}\left(\hat{j}+\hat{i}\right)$ (4) $\frac{7}{2}\left(\hat{j}+\hat{i}\right)$

61. The vector $\vec{B}=5\hat{i}+2\hat{j}-S\hat{k}$ is perpendicular to the vector $\vec{A}=3\hat{i}+\hat{j}-2\hat{k}$ if S =

(1) 1 (2) 4.7 (3) 6.3 (4) 8.5

62. What is the projection of $\vec{A}$ on $\vec{B}$?

(1) $\vec{A}.\vec{B}$ (2) $\vec{A}.\hat{B}$ (3) $\vec{B}.\vec{A}$ - (4) $\hat{A}.\hat{B}$

63. The angle between vectors $\left(\hat{i}+\hat{j}\right)$ and $\left(\hat{j}+\hat{k}\right)$ is :

(1) 90º (2) 180º (3) 0º (4) 60º

64. The angle between the two vectors $\vec{A}=3\hat{i}+4\hat{j}+5\hat{k}$ and $\vec{B}=3\hat{i}+4\hat{j}-5\hat{k}$ will be :-

(1) zero (2) 180º (3) 90º (4) 45º

65. Let $\vec{A}=\hat{i}A\cos\theta+\hat{j}A\sin\theta$, be any vector. Another vector $\vec{B}$ which is normal to $\vec{A}$ is :

(1) $\hat{i}B\cos\theta+\hat{j}B\sin\theta$ (2) $\hat{i}B\sin\theta+\hat{j}B\cos\theta$

(3) $\hat{i}B\sin\theta-\hat{j}B\cos\theta$ (4) $\hat{i}A\cos\theta-\hat{j}A\sin\theta$

66. The vector $\vec{P}=a\hat{i}+a\hat{j}+3\hat{k}$ and $\vec{Q}=a\hat{i}-2\hat{j}-\hat{k}$ are perpendicular to each other. The positive value of a is :

(1) 3 (2) 2 (3) 1 (4) zero

67. A force $\vec{F}=\left(3\hat{i}+4\hat{j}\right)$ N acts on a body and displaces it by $\vec{S}=\left(3\hat{i}+4\hat{j}\right)$ m. The work done $\left(W=\vec{F}\cdot\vec{S}\right)$ by the force is :

(1) 10 J (2) 12 J (3) 19 J (4) 25 J

68. What is the projection of $3\hat{i}+4\hat{k}$ on the y-axis?

(1) 3 (2) 4 (4) 5 (4) zero

69. If vector $(2\hat{i}+3\hat{j}+8\hat{k})$ is perpendicular to the vector $(4\hat{i}-4\hat{j}+\alpha\hat{k})$, then the value of α is :

(1) –1 (2) 1/2 (3) –1/2 (4) 1

70. If $\vec{A}=3\hat{i}+4\hat{j}$ and $\vec{B}=6\hat{i}+8\hat{j}$ and A and B are the magnitudes of $\vec{A}$ and $\vec{B}$, then which of the following is not true?

(1) $\vec{A}\times\vec{B}=\vec{0}$ (2) $\frac{A}{B}=\frac{1}{2}$ (3) $\vec{A}.\vec{B}=48$ (4) A = 5

71. A vector $\vec{F}_1$ is along the positive X-axis. If its vector product with another vector $\vec{F}_2$ is zero then $\vec{F}_2$ may be :-

(1) $4\hat{j}$ (2) $-\left(\hat{i}+\hat{j}\right)$ (3) $\left(\hat{i}+\hat{k}\right)$ (4) $-4\hat{i}$

72. If $\hat{i}$, $\hat{j}$ and $\hat{k}$ are unit vectors long X, Y & Z axis respectively, then tick the wrong statement:

(1) $\hat{i}.\hat{i}=1$ (2) $\hat{i}\times\hat{j}=\hat{k}$ (3) $\hat{i}.\hat{j}=0$ (4) $\hat{i}\times\hat{k}=-\hat{i}$

73. Two vectors $\vec{P}$ and $\vec{Q}$ are inclined to each other at angle θ. Which of the following is the unit vector perpendicular to $\vec{P}$ and $\vec{Q}$?

(1) $\frac{\vec{P}\times\vec{Q}}{P.Q}$ (2) $\frac{\hat{P}\times\hat{Q}}{\sin\theta}$ (3) $\frac{\hat{P}\times\hat{Q}}{PQ\sin\theta}$ (4) $\frac{\hat{P}\times\vec{Q}}{PQ\sin\theta}$-

74. The magnitude of the vector product of two vectors $\vec{A}$ and $\vec{B}$ may not be :

(1) Greater than AB (2) Less than AB (3) Equal to AB (4) Equal to zero

75. If $\vec{P}\times\vec{Q}=\vec{R}$, then which of the following statements is not true?

(1) $\vec{R}\perp\vec{P}$ (2) $\vec{R}\perp\vec{Q}$ (3) $\vec{R}\perp(\vec{P}+\vec{Q})$ (4) $\vec{R}\perp(\vec{P}\times\vec{Q})$

76. Which of the following vector identities is false?

(1) $\vec{P}+\vec{Q}=\vec{Q}+\vec{P}$ (2) $\vec{P}+\vec{Q}=\vec{Q}\times\vec{P}$ (3) $\vec{P}.\vec{Q}=\vec{Q}.\vec{P}$ (4) $\vec{P}\times\vec{Q}\neq\vec{Q}\times\vec{P}$

77. What is the value of $(\vec{A}+\vec{B}-)\bullet(\vec{A}\times\vec{B})$?

(1) 0 (2) A^2-B^2 (3) A^2+B^2+2AB (4) none of these

78. If $\vec{A}\times\vec{B}=\vec{0}$ and $\vec{B}\times\vec{C}=\vec{0}$, then the angle between $\vec{A}$ and $\vec{C}$ may be :

(1) zero (2) $\frac{\pi}{4}$ (3) $\frac{\pi}{2}$ (4) None

79. If the vectors $\left(\hat{i}+\hat{j}+\hat{k}\right)$ and $3\hat{i}$ form two sides of a triangle, then area of the triangle is :

(1) $\sqrt{3}$ unit (2) $2\sqrt{3}$ unit (3) $\frac{3}{\sqrt{2}}$ unit (4) $3\sqrt{2}$ unit

80. For a body, angular velocity $\vec{\omega}=\hat{i}-2\hat{j}+3\hat{k}$ and radius vector $\vec{r}=\hat{i}+\hat{j}+\hat{k}$, then its velocity $(\vec{v}=\vec{\omega}\times\vec{r})$ is :

(1) $-5\hat{i}+2\hat{j}+3\hat{k}$ (2) $-5\hat{i}+2\hat{j}-3\hat{k}$ (3) $-5\hat{i}-2\hat{j}+3\hat{k}$ (4) $-5\hat{i}-2\hat{j}-3\hat{k}$

81. Area of a parallelogram, whose diagonals are $3\hat{i}+\hat{j}-2\hat{k}$ and $\hat{i}-3\hat{j}+4\hat{k}$ will be :

(1) 14 unit (2) $5\sqrt{3}$ unit (3) $10\sqrt{3}$ unit (4) $20\sqrt{3}$ unit

82. The angle between vectors $(\vec{A}\times\vec{B})$ and $(\vec{B}\times\vec{A})$ is :

(1) π rad (2) $\frac{\pi}{2}$ rad (3) $\frac{\pi}{4}$ rad (4) zero

83. A vector $\hat{A}$ points vertically upward and $\hat{B}$ points towards north. The vector product $\hat{A} \times \hat{B}$ is
(1) zero (2) along west (3) along east (4) vertically downward

84. If $\left|\vec{A} \times \vec{B}\right| = \left|\vec{A}.\vec{B}\right|$, then the angle between $\hat{A}$ and $\hat{B}$ will be :
(1) 30º (2) 45º (3) 60º (4) 75º

ANSWER KEY

EXERCISE-I (Conceptual Questions)

1.	(2)	**2.**	(2)	**3.**	(1)	**4.**	(3)	**5.**	(2)	**6.**	(2)	**7.**	(2)
8.	(3)	**9.**	(1)	**10.**	(1)	**11.**	(4)	**12.**	(4)	**13.**	(4)	**14.**	(3)
15.	(4)	**16.**	(1)	**17.**	(2)	**18.**	(4)	**19.**	(3)	**20.**	(4)	**21.**	(2)
22.	(2)	**23.**	(3)	**24.**	(3)	**25.**	(1)	**26.**	(2)	**27.**	(3)	**28.**	(4)
29.	(1)	**30.**	(2)	**31.**	(2)	**32.**	(4)	**33.**	(4)	**34.**	(1)	**35.**	(3)
36.	(2)	**37.**	(3)	**38.**	(4)	**39.**	(2)	**40.**	(4)	**41.**	(2)	**42.**	(2)
43.	(3)	**44.**	(3)	**45.**	(3)	**46.**	(1)	**47.**	(2)	**48.**	(2)	**49.**	(2)
50.	(1)	**51.**	(4)	**52.**	(3)	**53.**	(2)	**54.**	(3)	**55.**	(3)	**56.**	(2)
57.	(1)	**58.**	(1)	**59.**	(2)	**60.**	(4)	**61.**	(4)	**62.**	(2)	**63.**	(4)
64.	(3)	**65.**	(3)	**66.**	(1)	**67.**	(4)	**68.**	(4)	**69.**	(3)	**70.**	(3)
71.	(4)	**72.**	(4)	**73.**	(2)	**74.**	(1)	**75.**	(4)	**76.**	(2)	**77.**	(1)
78.	(1)	**79.**	(3)	**80.**	(1)	**81.**	(2)	**82.**	(1)	**83.**	(2)	**84.**	(2)