

Chapter 09. VECTORS

1) The triangle law for vector addition is equivalent to the

- A) Commutative law
- B) Associative law
- C) Parallelogram law
- D) First law

Answer: C

2) The position vector of a point P(x, y, z) is denoted by

- A) \overrightarrow{PQ}
- B) \overrightarrow{OP}
- C) \overline{P}
- D) \overrightarrow{AP}

Answer: B

3) If $\text{Cos}\alpha$, $\text{Cos}\beta$, $\text{Cos}\chi$ are the directions Cosines of a vector then

- A) $\text{Cos}\alpha + \text{Cos}\beta + \text{Cos}\chi = 1$
- B) $\text{Cos}^2\alpha + \text{Cos}^2\beta + \text{Cos}^2\chi = 0$
- C) $\text{Cos}^2\alpha + \text{Cos}^2\beta + \text{Cos}^2\chi = 1$
- D) $\text{Cos}\alpha + \text{Cos}\beta + \text{Cos}\chi = 0$

Answer: C

4) The numbers proportional to the direction cosines of a vector are called

- A) Vector numbers
- B) Scalar numbers
- C) Direction numbers
- D) Rational numbers

Answer: C

5) Two or more vectors are said to be collinear if they are

- A) perpendicular to the same line
- B) parallel to the same line
- C) intersecting the same line
- D) not parallel to the same line

Answer: B

6) Two or more vectors are said to be coplanar if they

- A) are perpendicular to the same plane
- B) are not parallel to the same plane
- C) lie in the same plane
- D) do not lie in the same plane

Answer: C

7) The component of $\overline{a} = 3\overline{i} + 4\overline{j}$ in the direction of z-axis is

- A) 3
- B) 4
- C) 0
- D) 7

Answer: C

8) the unit vector in the direction of the vector

$$\overline{a} = \overline{i} + \overline{j} + \overline{k} \text{ is}$$

- A) $\frac{\overline{a}}{3a}$
- B) $\frac{\overline{a}}{3}$
- C) $\frac{\overline{a}}{\sqrt{3}}$
- D) $\frac{\overline{a}}{\sqrt{2}}$

Answer: C

9) The vectors $\overline{a} = \overline{i} + 2\overline{j} + 3\overline{k}$ and $\overline{b} = 2\overline{i} + 4\overline{j} + 6\overline{k}$ are

- A) Perpendicular
- B) Parallel
- C) Not parallel
- D) None of these

Answer: B

10) The join of the mid points of the consecutive sides of any quadrilateral is

- A) a square
- B) a rectangle
- C) a parallelogram
- D) none of these

Answer: C

11) If A (1, 2, 3) and B (3, 4, 5) are two points then the mid point of \overline{AB} is

- A) (4, 3, 5)
- B) (4, 6, 8)
- C) (4, 5, 6)
- D) (2, 3, 4)

Answer: D

12) The direction Cosines of \overline{i} are

- A) 0, 0, 1
- B) 0, 1, 0
- C) 1, 0, 0
- D) 1, 1, 0

Answer: C

13) The direction cosines of the vector $\overline{a} = \overline{i} + \overline{j}$ are

- A) 1, 1, 0
- B) $\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}, 1$
- C) $1, \frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}$

D) $\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}, 0$

Answer: D

14) The magnitude of the vector $\vec{a} = \vec{i} - \vec{j}$ is

- A) 0
- B) 2
- C) $\sqrt{2}$
- D) 1

Answer: C

15) If $\vec{a} = 3\vec{i} + \vec{j} - \vec{k}$ and $\vec{b} = \lambda\vec{i} - 4\vec{j} + 4\vec{k}$ are parallel then the value of λ is

- A) 4
- B) 8
- C) 12
- D) -12

Answer: D

Products of Vectors

1) If \vec{a} is a unit vector then the value of $\vec{a} \cdot \vec{b}$ is

- A) 1
- B) $|\vec{a}| \cos \theta$
- C) $|\vec{b}| \cos \theta$
- D) 0

Answer: C

2) The projection of \vec{a} in the direction of \vec{b} is

- A) $|\vec{b}| \cos \theta$
- B) $ab \cos \theta$
- C) ab
- D) $|\vec{a}| \cos \theta$

Answer: D

3) If $\vec{a} = \vec{i} + \vec{j}$ and $\vec{b} = \vec{i} + \vec{k}$ are two vectors then inner product of \vec{a} and \vec{b} are

- A) 1
- B) -1
- C) 0
- D) 2

Answer: A

4) The dot product of \vec{i} and \vec{j} is

- A) 1
- B) -1
- C) 0

D) 2

Answer: C

5) If $l_1 l_2 + m_1 m_2 + n_1 n_2 = 0$ then the angle between the two vectors is

- A) 45°
- B) 60°
- C) 90°
- D) 180°

Answer: C

6) If the right bisectors of the two sides of a triangle pass through the origin then the right bisector of the third side will pass through the point

- A) (1, 1)
- B) (1, 2)
- C) (1, 3)
- D) (0, 0)

Answer: D

7) The equation $2x + 3y + 6z = 35$ represents

- A) a line
- B) a circle
- C) a plane
- D) a parabola

Answer: C

8) If \vec{a} is the position vector of a given point (1, 2, 3) and $\vec{\chi}$ is the position vector of any point (x, y, z) such that $|\vec{\chi} - \vec{a}| = 2$ then the locus of $\vec{\chi}$ describes

- A) a circle
- B) an ellipse
- C) a plane
- D) a sphere

Answer: D

9) the equation $(x - 1)^2 + (y - 3)^2 + (z - 5)^2 = 25$ represents

- A) a circle
- B) a sphere
- C) a plane
- D) an ellipse

Answer: B

10) The coordinates of the center of the sphere $x^2 + y^2 + z^2 = 9$ is

- A) (0, 0)
- B) (3, 3, 0)
- C) (0, 0, 0)
- D) (0, 0, 3)

Answer: C

17) If $\vec{a} = i + 2j + 3k$, $\vec{b} = 2i + 4j + 6k$ and $\vec{c} = 3i - j + k$ then the value of $\vec{a} \cdot \vec{b} \times \vec{c}$ is

- A) 28
- B) 26
- C) 0
- D) 24

Answer: C

11) If \vec{a} is the position vector of a given point (1, 1, 1) and $\vec{\chi}$ is the position vector of any point (x, y, z) such that $|\vec{\chi} - \vec{a}| \cdot \vec{a} = 0$ then the locus of $\vec{\chi}$ describes.

- A) a sphere
- B) a circle
- C) an ellipse
- D) a plane

Answer: D

12) The distance from the origin to the plane

- A) 7
- B) 0
- C) 1
- D) 2

Answer: C

13) The contact in which the point coordinates are all positive is called

- A) 1st octant
- B) 2nd octant
- C) 4th octant
- D) 8th octant

Answer: A

14) The point (3, 5, 8) lies in the

- A) 3rd octant
- B) 5th octant
- C) 8th octant
- D) 1st octant

Answer: D

15) The three coordinate's planes divide all space into

- A) 3 cells
- B) 4 cells
- C) 8 cells
- D) 6 cells

Answer: C

16) If $\vec{a} = i + 2j + k$, $\vec{b} = 3i + j - k$ and $\vec{c} = i + 2j + k$ are the co-terminus edges of a parallelepiped then its volume is

- A) 0
- B) 8
- C) 27
- D) 1

Answer: A