Unit 7: Vectors

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

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

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

A) $\overrightarrow{PQ}$
B) $\overrightarrow{OP}$
C) $\bar{P}$
D) $\overrightarrow{AP}$

3) If Cosα, Cosβ, Cosχ are the directions Cosines of a vector then

A) Cosα + Cosβ + Cos χ = 1
B) $Cos^2\alpha + Cos^2\beta + Cos^2\chi = 0$
C) $Cos^2\alpha + Cos^2\beta + Cos^2\chi = 1$
D) Cosα + Cosβ + Cos χ = 0

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

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

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

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

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

8) the unit vector in the direction o f the vector $\bar{a} = i + j + k$ is

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

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

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

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

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

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

12) The direction Cosines of $\bar{i}$ are
A) 0, 0, 1
B) 0, 1, 0
C) 1, 0, 0
D) 1, 1, 0

13) The direction cosines of the vector $\bar{a} = \bar{i} + \bar{j}$ 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) $\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}, 0$

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

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

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

A) 4
B) 8
C) 12
D) – 12

Products of Vectors

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

A) 1
B) $|\bar{a}|\cos q$
C) $|\bar{b}|\cos q$
D) 0

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

A) $|\bar{b}|\cos q$
B) ab Cosθ
C) ab
D) $|\bar{a}|\cos q$

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

A) 1
B) – 1
C) 0
D) 2

4) The inner product of $\bar{i}$ and $\bar{j}$ is

A) 1
B) – 1
C) 0
D) 2

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^o
B) 60^o
C) 90^o
D) 180^o

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)

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

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

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

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

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

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)

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

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

12) The distance from the origin to the plane

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

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

A) 1^{st} octant
B) 2^{nd} octant
C) 4^{th} octant
D) 8^{th} octant

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

A) 3^{rd} octant
B) 5^{th} octant
C) 8^{th} octant
D) 1^{st} octant

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

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

16 If $\bar{a} = i + 2j + k$, $\bar{b} = 3i + j - k$ and $\bar{c} = i + 2j + k$ are the co-terminus edges of a parallelepiped then its volume is
A) 0
B) 8
C) 27
D) 1

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

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

18) If volume of a parallelepiped with $\bar{a}, \bar{b}, \bar{c}$ as co-terminus edges is 24 the volume of the tetrahedron with the same edges is

A) 48
B) 12
C) 6
D) 4

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Written by NAUMAN IDREES
(nomi255@yahoo.com)
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ICMS College System Hayatabad, Peshawar