CHAPTER # 2: VECTORS AND EQUILIBRIUM

1) Rectangular coordinate system is also called.

a) polar coordinate system
b) Cartesian coordinate system
c) Cylindrical coordinate system
d) Space coordinate system

2) The direction of a vector in space is specified by.
a) one angle
b) two angle
c) three angle
d) no angle

3) Maximum number of rectangular components are
a) one
b) two
c) three
d) infinite

4) The resultant of two forces of equal magnitudes is also equal to the magnitude of the forces. The angle between the two forces is.
a) 30^o
b) 60^o
c) 90^o
d) 120^o

5) In which quadrant the two rectangular components of a vector have same sigh?
a) 1st
b) 2nd
c) both 1st and 3rd
d) 4th

6) Two vectors A and B are making angle θ with each other. The scalar projection of vector B on vector A is written as.

a) A.B/ A
b) A.B/ B
c) cos θ
d) Both a and b are correct.

7) $\hat{\imath} \cdot (\hat{\jmath} \times \hat{k})$ is equal to.

a) 1
b) $\hat{\imath}$
c) $\hat{\jmath}$
d) $\hat{k}$

8) The direction of vector product is given by.
a) head to tail rule
b) right hand rule
c) left hand rule
d) triangular rule

9) Null vector is a vector which has.
a) zero magnitude
b) no specified direction
c) both a and b are correct
d) both a and b are not correct

10) Torque is defined as.
a) turning effect of force
b) cross product of force and position vector
c) product of force and moment arm
d) all a, b and c are correct

11) The dimension of torque is.
a) $[ML^2T^{-2}]$
b) $[MLT^{-2}]$
c) $[ML^2T]$
d) $[ML^{-2}T^{-2}]$

12) SI unit of torque is.
a) N . m
b) Joule
c) Both a and b are correct
d) Neither a nor be is correct

13) A body in equilibrium.
a) always at rest
b) always in uniform motion
c) may be at rest or in uniform motion
d) may be at rest or in motion

14) A body will be in complete equilibrium when it is satisfying.

a) 1st condition of equilibrium
b) 2nd condition of equilibrium
c) both 1st and 2nd condition of equilibrium
d) impossible

15) The cross product $\hat{\imath} \times \hat{\jmath}$ is equal to

a) zero
b) one
c) $-\hat{k}$
d) $\hat{k}$

16) The unit vector in the direction of vector $\vec{A} = 2\hat{\imath} - 2\hat{\jmath} + \hat{k}$ is

(a) $2\hat{\imath} - 2\hat{\jmath} + \hat{k}$
(b) $(2\hat{\imath} - 2\hat{\jmath} + \hat{k})/9$
(c) $(2\hat{\imath} - 2\hat{\jmath} + \hat{k})/3$
(d) $(2\hat{\imath} - 2\hat{\jmath} + \hat{k})/5$

17) If $\mathbf{A} = A_x\hat{\imath} + A_y\hat{\jmath} + A_z\hat{k}$ and $\mathbf{B} = B_x\hat{\imath} + B_y\hat{\jmath} + B_z\hat{k}$ then.

(a) $\mathbf{A}.\mathbf{B} = A_xB_x + A_yB_y + A_zB_z$
(b) $\mathbf{A}.\mathbf{B} = A_xB_y + A_yB_z + A_zB_x$
(c) $\mathbf{A}.\mathbf{B} = A_yB_z + A_zB_y + A_zB_x$
(d) $\mathbf{A}.\mathbf{B} = A_xB_z + A_yB_y + A_zB_x$

18) The vector in space has

(a) Two components
(b) One component
(c) Three components
(d) Four components

Written and composed by: Prof. Muhammad Ali Malik (M. Phil. Physics), Govt. Degree College, Naushera

19) A unit vector is obtained by dividing a vector with:

(a) Its direction
(b) Its magnitude
(c) Its magnitude and direction
(d) None

20) Name the quantity which is vector:

(a) Density
(b) Power
(c) Charge
(d) Moment of Force

21) A force is acting along y axis. Its component along x-axis is

(a) 5 N
(b) Zero
(c) 10 N
(d) 2.5 N

22) At what angle, the components of a vector have same magnitude:

(a) 0^0
(b) 30^0
(c) 45^0
(d) 90^0

23) If the x-component of a vector is positive and y-component, then resultant vector lies in what quadrant:
(a) 1st quadrant
(b) 2nd quadrant
(c) 3rd quadrant
(d) 4th quadrant

24) SI unit of torque is:
(a) Nm^{-1}
(b) Nm
(c) Nm^{-2}
(d) None

25) Dot product of two non-zero vectors is zero, when angle between them is:
(a) 0^0
(b) 30^0
(c) 45^0
(d) 90^0

26) The cross product $\hat{\imath} \times \hat{\imath} = \hat{\jmath} \times \hat{\jmath} = \hat{k} \times \hat{k}$ is equal to

(a) 1
(b) -1
(c) Zero
(d) None

27) For a body to be in complete equilibrium,

(a) $a = 0 \; and \; \alpha = 0$
(b) $\sum F = 0$
(c) $\sum \tau = 0$
(d) None

28) If a body is rotating with constant angular velocity, its torque will be:

(a) 0
(b) Maximum
(c) May be zero
(d) None

29) If $\mathbf{A} = 2\hat{\imath} - \hat{\jmath} + 3\hat{k}$, then the magnitude of vector A is:

(a) 4
(b) 14
(c) $\sqrt{14}$
(d) None

30) If $A_x = A_y$, then the angle between the vector A with x-axis will be:

(a) 0^0
(b) 30^0
(c) 45^0
(d) 90^0

31) If vector A lies in the third quadrant, its direction will be:

(a) $180^0 - \phi$
(b) $360^0 - \phi$
(c) $180^0 + \phi$
(d) $None$

Written and composed by: Prof. Muhammad Ali Malik (M. Phil. Physics), Govt. Degree College, Naushera