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M.Sc Math
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معروضی (ریاضی)

CH# 7

i) Vector quantity posseses _____.
a- Magnitude b- Direction c- a,b both d- None of these.

ii) Magnitude of unit vector is _____.
a- 0 b- 1 c- -1 d- 2

iii) _____ vector has magnitude unity.
a- Null b- Unit c- Position d- Coplaner.

iv) Unit vector in the direction of $\vec{v}$ is denoted by _____.
a- $\vec{v}$ b- $\hat{v}$ c- $|\vec{v}|$ d- $\vec{v}\,\hat{v}$

v) Magnitude of $\hat{i}$ ($\hat{j}$ or $\hat{k}$) is _____.
a- 0 b- -1 c- 1 d- 2

vi) $\vec{AB}$ is _____ vector if A and B points coincide.
a- unit b- Null c- Position d- Free

vii) unit vector in the direction of $\vec{v}$ is _____.
a- $\frac{\vec{v}}{|\vec{v}|}$ b- $\vec{v}|\vec{v}|$ c- $|\vec{v}|\,\hat{v}$ d- $\frac{|\vec{v}|}{\vec{v}}$

viii) If $\vec{AB}$ is a vector then $\vec{BA}$ is called _____ of $\vec{AB}$.
a- Equal vector b- Unit vector c- Negative vector d- Position vector

ix) $\vec{v}$ and $K\vec{v}$ are _____ vectors.
a- Equal b- Parallel c- Position d- Perpendicular

x) Angle between $\vec{v}$ and $K\vec{v}$ is _____ if $K<0$.
a- 0° b- 45° c- 90° d- 180°

xi) Angle between $\vec{v}$ and $K\vec{v}$ is _____ if $K>0$.
a- 0° b- 45° c- 90° d- 180°

xii) Equal vectors have same _____.
a- Magnitude b- Direction c- a,b both d- None of these.

xiii) If $\vec{u}=[x,y]$ and $\alpha \in \mathbb{R}$ then $\alpha\vec{u}$ = _____.
a- $[\alpha x, y]$ b- $[x, \alpha y]$ c- $[\alpha x, \alpha y]$ d- $[x,y]$

xiv) If $\vec{u}=[x,y]$ and $\vec{v}=[\acute{x},\acute{y}]$, $\vec{u}=\vec{v}$ if _____.
a- $x=\acute{x}$ b- $y=\acute{y}$ c- $x=y$, $\acute{x}=\acute{y}$ d- $x=\acute{x}$, $y=\acute{y}$

xv) Magnitude of $\vec{u}=[x,y]$ is defined as $|\vec{u}|$ = _____.
a- $\sqrt{x+y}$ b- $\sqrt{x^2+y^2}$ c- $\sqrt{x^2-y^2}$ d- $\sqrt{y-x}$

xvi) If $\vec{u}=[x,y]$ then $|\vec{u}|=0$ iff _____.
a- $\vec{u}=[0,y]$ b- $\vec{u}=[x,0]$ c- $\vec{u}=[0,0]$ d- $\vec{u}=[x,-x]$

xvii) unit vector along x-axis is _____. a- $\hat{i}$ b- $\hat{j}$ c- $\hat{k}$ d- All

Math (OBJECTIVE)

xviii) $[x,0]+[0,y]=$ _____

✓a- $[x,y]$ b- $[x,0]$ c- $[0,y]$ d- $[0,y,x,0]$

xix) $\left|\frac{1}{|\vec{v}|}\vec{v}\right|=$ _____ for any vector $\vec{v}$

a- $\vec{v}$ b- $|\vec{v}|$ c- $\frac{1}{|\vec{v}|}$ ✓d- 1

xx) If $\vec{v}=[3,-4]$ then $|\vec{v}|=$ _____.

a- 3 b- 4 c✓- 5 d- -1

xxi) $\vec{u}=[3,-4]$ then $\hat{u}=$ _____.

a- $[3,4]$ b- $[-4,3]$ c- $[-4/5, 3/5]$ ✓d- $[3/5, -4/5]$

xxii) Figure formed by joining mid points of quadrilateral is _____.

a- Triangle b- Circle c✓- Parallelogram d- Square.

xxiii) A point in Space has _____ co-ordinates.

a- 1 ✓b- 3 c- 2 d- 4

xxiv) $x[1,0,0]+y[0,1,0]+z[0,0,1]=$ _____.

a- $[x,0,0]$ b- $[0,y,0]$ c- $[0,0,z]$ ✓d- $[x,y,z]$

xxv) $[1,0,0]+[0,1,0]+[0,0,1]=$ _____.

✓a- $\hat{i}+\hat{j}+\hat{k}$ b- $\hat{i}$ c- $\hat{j}$ d- $\hat{k}$

xxvi) angle between $\vec{u}$ and $-\vec{u}$ is _____.

a- 0° b- 90° c✓- 180° d- 270°

xxvii) α,β,γ are called direction _____ of a vector.

a- Ratios b✓- Angles c- Cosines d- Vectors

xxviii) If α,β,γ are direction angles of a vector then _____.

✓a- $0\le\alpha,\beta,\gamma\le\pi$ b- $0\le\alpha,\beta,\gamma\le\pi/2$ c- $0\le\alpha,\beta,\gamma\le 2\pi$ d- $-\pi\le\alpha,\beta,\gamma\le\pi$

xxix) Components of unit vector are called _____.

a- Direction angles b- Direction ratios ✓c- Direction Cosines d- None

xxx) Null vector is _____ to each vector.

a- Parallel b- Perpendicular ✓c- a,b both d- None of these.

xxxi) $\cos^2\alpha+\cos^2\beta+\cos^2\gamma=$ _____.

a- 0 ✓b- 1 c- -1 d- 2

xxxii) $\cos\alpha\,\hat{i}+\cos\beta\,\hat{j}+\cos\gamma\,\hat{k}$ is called _____ vector.

✓a- unit b- Null c- Position d- Free

xxxiii) If l,m,n are direction cosines then $l^2+m^2+n^2=$ _____.

a- 0 b- -1 ✓c- 1 d- 2

xxxiv) _____ is unit vector. a- $[1,0,1]$ b- $[1,0,-1]$ c- $[1,-1,1]$ ✓d- $[0,0,1]$

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2nd Year

Math (OBJECTIVE)

35) $\vec{u}\cdot\vec{v} = |\vec{u}|\,|\vec{v}|\cos\theta$ where _____.

a- $0\le\theta\le\pi/2$ b- ✓ $0\le\theta\le\pi$ c- $-\pi/2\le\theta\le\pi/2$ d- $-\pi\le\theta\le\pi$

36) If $\vec{a} = a_1\hat{i} + a_2\hat{j}$ and $\vec{b} = b_1\hat{i} + b_2\hat{j}$ then $\vec{a}\cdot\vec{b}$ = _____.

a- ✓ $a_1b_1 + a_2b_2$ b- $a_1b_2 + a_2b_1$ c- $a_1a_2 + b_1b_2$ d- $a_1b_1 - a_2b_2$.

37) $\hat{i}\cdot\hat{i}$ ($\hat{j}\cdot\hat{j}$ or $\hat{k}\cdot\hat{k}$) is _____.

a- 0 b- i c- i^2 ✓ d- 1

38) $\hat{i}\cdot\hat{j}$ = _____ ($\hat{j}\cdot\hat{k}$ or $\hat{k}\cdot\hat{i}$ Similarly)

a- $\hat{k}$ b- $\hat{i}$ c- $\hat{j}$ ✓ d- 0

39) $\vec{u}\cdot\vec{v} = 0$ if angle between $\vec{u}$ and $\vec{v}$ is _____.

a- $0°$ b- $45°$ ✓ c- $90°$ d- $180°$

40) $\vec{u}\cdot\vec{v} = 0$ if _____.

a- $\vec{u} = \vec{0}$ b- $\vec{v} = \vec{0}$ c- $\theta = 90°$ ✓ d- a, b c all

41) $\vec{u}\cdot\vec{u}$ = _____.

a- $|\vec{u}|$ ✓ b- $|\vec{u}|^2$ c- 1 d- 0

42) If $\vec{u}$ is a unit vector then $k\vec{u}\cdot\vec{u}$ = _____.

a- $k|\vec{u}|^2$ ✓ b- k c- $k|\vec{u}|$ d- 0

43) $\vec{u}\cdot\vec{v}$ = _____ where θ is angle between $\vec{u}$ and $\vec{v}$.

a- $|\vec{u}|\,|\vec{v}|\sin\theta$ b- $|\vec{u}|\,|\vec{v}|\sin\theta\hat{n}$ ✓ c- $|\vec{u}|\,|\vec{v}|\cos\theta$ d- $|\vec{u}|\,|\vec{v}|\tan\theta$

44) Angle between $\vec{u}$ and $\vec{v}$ is acute if _____.

a- $\vec{u}\cdot\vec{v} = 0$ b- $\vec{u}\cdot\vec{v} < 0$ ✓ c- $\vec{u}\cdot\vec{v} > 0$ d- None of these

45) Projection of $\vec{u}$ along $\vec{v}$ is _____.

✓ a- $|\vec{u}|\cos\theta$ b- $|\vec{u}|\sin\theta$ c- $|\vec{v}|\cos\theta$ d- $|\vec{v}|\sin\theta$

46) _____ = $b\cos C + c\cos B$ is called Law of Projection.

a- ✓ a b- b c- c d- None of these

47) If $\vec{v}\cdot\hat{i} = 0$, $\vec{v}\cdot\hat{j} = 0$, $\vec{v}\cdot\hat{k} = 0$ then $\vec{v}$ = _____.

✓ a- $\vec{v} = \vec{0}$ b- $\vec{v} = \hat{i}$ c- $\vec{v} = \hat{j}$ d- $\vec{v} = \hat{k}$

48) $\vec{u}\times\vec{v}$ is a vector _____ to the plane of $\vec{u}$ and $\vec{v}$.

a- Parallel ✓ b- Perpendicular c- Coplaner d- Collinear

49) $\hat{i}\times\hat{i}$ = _____ (similarly $\hat{j}\times\hat{j}$, $\hat{k}\times\hat{k}$)

a- ✓ $\vec{0}$ b- i^2 c- $\hat{j}$ d- $\hat{k}$

50) $\hat{i}\times\hat{j}$ = _____ a- $\vec{0}$ b- $\hat{i}$ c- $\hat{j}$ ✓ d- $\hat{k}$

51) $\hat{j}\times\hat{k}$ = _____ a- ✓ $\hat{i}$ b- $\hat{j}$ c- $\hat{k}$ d- $\vec{0}$

52) $\hat{k}\times\hat{i}$ = _____ a- $\hat{i}$ ✓ b- $\hat{j}$ c- $\hat{k}$ d- $\vec{0}$

2nd Year

Math (OBJECTIVE)

53) Which is not true Law in vectors?
a- $\vec{u}+\vec{v}=\vec{v}+\vec{u}$ b- $\vec{u}\cdot\vec{v}=\vec{v}\cdot\vec{u}$ ✓c- $\vec{u}\times\vec{v}=\vec{v}\times\vec{u}$ d- a,b,c all

54) $\vec{u}\times\vec{u}=$ ____ ✓a- $\vec{0}$ b- $|\vec{u}|$ c- $|\vec{u}|^2$ d- 1

55) Cross product of two parallel vectors is ____.
a✓ Null Vector b- Unit Vector c- Real number d- Imaginary vector

56) $\cos\theta=$ ____ between two vectors $\vec{u}$ and $\vec{v}$.
a- $\frac{\vec{u}\cdot\vec{v}}{|u|}$ b- $\frac{\vec{u}\cdot\vec{v}}{|v|}$ ✓c- $\frac{\vec{u}\cdot\vec{v}}{|u||v|}$ d- None

57) Geomatrically $|\vec{a}\times\vec{b}|$ is area of ____ with adjecant Sides $\vec{a},\vec{b}$.
a- triangle b- Circle ✓c- Parallelogram d- tetrahedron.

58) $\vec{u}+\vec{v}=\vec{u}-\vec{v}$ if ____.
a- $\vec{u}=\vec{v}$ b- $\vec{u}=\vec{0}$ ✓c- $\vec{v}=\vec{0}$ d- $\vec{u}=2\vec{v}$

59) $\hat{i}\cdot\hat{i}+\hat{j}\cdot\hat{j}+\hat{k}\cdot\hat{k}=$ ____. a- 0 b- 1 c- 2 ✓d- 3

60) $\hat{i}\times\hat{i}+\hat{j}\times\hat{j}+\hat{k}\times\hat{k}=$ ____ ✓a- $\vec{0}$ b- $\hat{i}$ c- $\hat{j}$ d- $\hat{k}$

61) $\vec{u}\cdot(\vec{v}\times\vec{w})=$ ____ for $\vec{u},\vec{v},\vec{w}$ Coplaner vectors.
a✓ 0 b- 1 c- -1 d- 4

62) If $\vec{u}\cdot(\vec{v}\times\vec{w})=1$ then $\vec{v}\cdot(\vec{u}\times\vec{w})=$ ____.
a- 0 b- 1 ✓c- -1 d- 3

63) $\vec{u}\cdot(\vec{v}\times\vec{w})=$ ____ with $\vec{u},\vec{v},\vec{w}$ Coterminal Sides.
a✓ Volume of Parallelopiped b- Area of triangle
c- Area of Parallelogram d- Volume of tetrahedron.

64) $\hat{i}\cdot(\hat{j}\times\hat{k})=$ ____. a- 0 b- -1 c- -2 ✓d- 1

65) ____ is the example of dot product.
a- Torque b- Force ✓c- Work d- Momentum

66) Volume of parallelopiped is ____.
a- $|\vec{u}\times\vec{v}|$ b- $\frac{1}{2}|\vec{u}\times\vec{v}|$ ✓c- $[\vec{u}\ \vec{v}\ \vec{w}]$ d- $\frac{1}{6}[\vec{u}\ \vec{v}\ \vec{w}]$

67) $\vec{u}\cdot(\vec{v}\times\vec{w})=0$ if $\vec{u},\vec{v},\vec{w}$ are ____ vectors.
a- unit ✓b- Coplaner c- Position d- Perpendicular

68) Volume of tetrahedron is ____.
a- $\frac{1}{2}[\vec{u}\times\vec{v}]$ b- $|\vec{u}\times\vec{v}|$ c- $[\vec{u}\ \vec{v}\ \vec{w}]$ ✓d- $\frac{1}{6}[\vec{u}\ \vec{v}\ \vec{w}]$

69) $\hat{i}\cdot(\hat{j}\times\hat{k})+\hat{j}\cdot(\hat{k}\times\hat{i})+\hat{k}\cdot(\hat{i}\times\hat{j})=$ ____
a- 0 b- 1 c- 2 ✓d- 3

70) $\hat{i}\cdot(\hat{j}\times\hat{i})=$ ____ ✓a- 0 b- 1 c- 2 d- -1

71) ____ is a vector. a- Length b- Speed ✓c- Velocity d- Volume.

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Math (OBJECTIVE)

72) $\hat{i}, \hat{j}, \hat{k}$ are called _____.
✓a- unit vectors b- zero vectors c- Parallel vectors d- Equal vectors.

73) Which is a scalar quantity?
a- Force ✓b- time c- Velocity d- Displacement

74) If $(\vec{u}\times\vec{v})\cdot\vec{w} = |\vec{u}\times\vec{v}||\vec{w}|\cos\theta$ then $|\vec{w}|\cos\theta$ is called _____.
a- Area of triangle ✓b- Height of parallelopiped c- Volume of ||piped d None

75) If $\vec{A}$ and $\vec{B}$ are parallel then $\vec{A}\times\vec{B}$ = _____.
✓a- 0 b- -1 c- 1 d- 2

76) If P(2,3) and Q(6,-2) then $\vec{PQ}$ is _____.
a- $4\hat{i}+5\hat{j}$ b- $-4i-5\hat{j}$ ✓c- $4i-5j$ d- $-4\hat{i}+5\hat{j}$

77) The Sine angle between $\vec{a}$ and $\vec{b}$ is _____.
a- $\frac{\vec{a}\cdot\vec{b}}{|\vec{a}||\vec{b}|}$ ✓b- $\frac{|\vec{a}\times\vec{b}|}{|\vec{a}||\vec{b}|}$ c- $\frac{|\vec{a}||\vec{b}|}{|\vec{a}\times\vec{b}|}$ d- $\frac{|\vec{a}||\vec{b}|}{|\vec{a}\cdot\vec{b}|}$

78) If $\vec{a}\times\vec{b}=0$ and $\vec{a}\cdot\vec{b}=0$ then _____.
a- $\vec{a}$ and $\vec{b}$ are || b- $\vec{a}$ and $\vec{b}$ are ⊥ ✓c- Either $\vec{a}=0$ or $\vec{b}=0$ d- $\vec{a}\neq 0$, $\vec{b}\neq 0$

79) Vectors lying in same plane are called _____ vectors.
a- Perpendicular b- Collineax c- Concurrent ✓d- Coplaner

80) Vectors intersecting at Single point are called _____ vectors.
a- Parallel b- Perpendicular ✓c- Concurrent d- Collinear

81) $-\hat{k}\times\hat{i}$ = _____ a- $\hat{i}$ b- $\hat{j}$ ✓c- $-\hat{j}$ d- $\hat{k}$

82) $\vec{a}\cdot(\vec{b}\times\vec{c})$ = _____ where $\vec{a},\vec{b},\vec{c}$ are non-coplaner vectors.
a- $\vec{a}\cdot(\vec{c}\times\vec{b})$ b- $\vec{c}\cdot(\vec{b}\times\vec{a})$ c- $\vec{b}\cdot(\vec{a}\times\vec{c})$ ✓d- $\vec{b}\cdot(\vec{c}\times\vec{a})$

83) Position vector of point (-1, 2, 3) is _____.
a- $\hat{i}+2\hat{j}+3\hat{k}$ ✓b- $-\hat{i}+2\hat{j}+3\hat{k}$ c- $\hat{i}-2\hat{j}+3\hat{k}$ d- $\hat{i}-2\hat{j}-3\hat{k}$

84) A force $\vec{F}$ displaces an object from A to B then work is _____.
a- $\vec{F}\times\vec{AB}$ b- $\vec{AB}\times\vec{F}$ ✓c- $\vec{F}\cdot\vec{AB}$ d- $-\vec{F}\cdot\vec{AB}$

85) Projection of $\vec{u} = a\hat{i}+b\hat{j}+c\hat{k}$ along $\hat{i}$ is _____
✓a- a b- b c- c d- 0

86) $\vec{a}\times K\vec{a}$ = _____ a- K ✓b- $\vec{0}$ c- Ka^2 d- K^2a

87) Angle between vectors $2\hat{i}+3\hat{j}+\hat{k}$ and $2\hat{i}-\hat{j}-\hat{k}$ is _____.
a- $\pi/6$ b- $\pi/4$ ✓c- $\pi/2$ d- π

88) If $\vec{OA}=\vec{a}$ and $\vec{OB}=\vec{b}$ then $\vec{AB}$ = _____.
a- $\vec{a}+\vec{b}$ ✓b- $\vec{b}-\vec{a}$ c- $\vec{b}+\vec{a}$ d- $\vec{a}-\vec{b}$

89) For any vector $\vec{A}$, $\vec{A}\cdot\vec{A}$ = _____ a- A ✓b- A^2 c- $A^2/2$ d- $2A^2$

The End

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