

VCTR COACHING CENTER
CLASS - XI

MATHS - CHAPTER 7, 8

I. CHOOSE $20 \times 1 = 20$

ANY 7

Q. No 30 is compulsory.

21. Construct 2×3

$$G_{11} = \begin{bmatrix} 2\vec{i} - 3\vec{j} \end{bmatrix}$$

22. $A = \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}$ Compute A^4

23. Compute $|A|$ Given $A = \begin{bmatrix} 3 & 4 & 1 \\ 0 & -1 & 2 \\ 5 & -2 & 6 \end{bmatrix}$

24. Find k if Area of Triangle $(-3, 0)$ $(3, 0)$ $(0, k)$ is 9 square units

25. Find λ if the vectors $\vec{a} = 3\vec{i} + 2\vec{j} + 9\vec{k}$
 $\vec{b} = \vec{i} + \lambda\vec{j} + 3\vec{k}$ parallel.

26. Prove that $\vec{r} = (\vec{r} \cdot \vec{i})\vec{i} + (\vec{r} \cdot \vec{j})\vec{j} + (\vec{r} \cdot \vec{k})\vec{k}$

27. Prove $\vec{a} \times (\vec{b} + \vec{c}) + \vec{b} \times (\vec{c} + \vec{a}) + \vec{c} \times (\vec{a} + \vec{b}) = \vec{0}$

28. Find $x + y$ if $\begin{bmatrix} 2x + y & 4x \\ 5x - 7 & 4x \end{bmatrix} = \begin{bmatrix} 7 & 7y - 13 \\ y & 2 + 6 \end{bmatrix}$

29. $\lambda = -2$ determine the value $\begin{bmatrix} 0 & 2\lambda & 1 \\ \lambda^2 & 0 & 3\lambda^2 + 1 \\ -1 & 6\lambda - 1 & 0 \end{bmatrix}$

30. Find Area of Triangle having the points
 $A(1, 0, 0)$ $B(0, 1, 0)$ $C(0, 0, 1)$

PART-C Any 7 Q. 40 is Compulsory

31. If D and E midpoint of side AB, AC of Triangle $\vec{BE} + \vec{DC} = \frac{3}{2} \vec{BC}$

32. Prove right angle Triangle $2\vec{i} + 4\vec{j} + 3\vec{k}$, $4\vec{i} + \vec{j} + 9\vec{k}$, $10\vec{i} - \vec{j} + 6\vec{k}$

33. Let $\vec{a}, \vec{b}, \vec{c}$ be unit vectors $\vec{a} \cdot \vec{b} = \vec{a} \cdot \vec{c} = 0$ and angle between \vec{b} and \vec{c} is $\frac{\pi}{3}$. Prove that $\vec{a} = \pm \frac{2}{\sqrt{3}} (\vec{b} \times \vec{c})$

34. If $\cos 2\theta = 0$ determine $\begin{vmatrix} 0 & \cos \theta & \sin \theta \\ \cos \theta & \sin \theta & 0 \\ \sin \theta & 0 & \cos \theta \end{vmatrix}^2$

35. $\begin{vmatrix} 1 & x & x \\ x & 1 & x \\ x & x & 1 \end{vmatrix}^2 = \begin{vmatrix} 1-2x & -x^2 & -x^2 \\ -x^2 & -1 & x^2-2x \\ -x & x^2-2x & -1 \end{vmatrix}$

36. $A = \begin{bmatrix} \frac{1}{2} & \alpha \\ 0 & \frac{1}{2} \end{bmatrix}$ Prove that $\sum_{k=1}^n \det(A^k) = \frac{1}{3} \left(1 - \frac{1}{4^n}\right)$

37. In Triangle ABC if $\begin{vmatrix} 1 & 1 & 1 \\ 1+\sin A & 1+\sin B & 1+\sin C \\ \sin A(1+\sin A) & \sin B(1+\sin B) & \sin C(1+\sin C) \end{vmatrix} = 0$
 ΔABC Isosceles Triangle.

38. If $\vec{a} \perp \vec{b}$ find cosine and sine angle
 $\vec{a} = 2\vec{i} + \vec{j} + 3\vec{k}$ $\vec{b} = 4\vec{i} - 2\vec{j} + 2\vec{k}$

39. Find P, Q, R, S

$$\begin{bmatrix} P^2 - 1 & 0 & -31 - Q^3 \\ 7 & R+1 & 9 \\ -2 & 8 & S-1 \end{bmatrix} = \begin{bmatrix} 1 & 0 & -4 \\ 7 & 3/2 & 9 \\ -2 & 8 & -\pi \end{bmatrix}$$

40. IF \vec{a}, \vec{b} unit vectors α is the angle b/w
 $\tan \frac{\alpha}{2} = \frac{|\vec{a} - \vec{b}|}{|\vec{a} + \vec{b}|}$

ANSWER ANY 7

41. $A = \begin{bmatrix} 1 & 3 & 5 \\ -6 & 8 & 3 \\ -4 & 6 & 5 \end{bmatrix}$ as sum of symmetric and skew symmetric

42. Using Factor Theorem $\det = \begin{vmatrix} 1 & x^2 & x^3 \\ 1 & y^2 & y^3 \\ 1 & z^2 & z^3 \end{vmatrix} = (x-y)(y-z)(z-x)(x+y+yz+zx)$

43. Show that $\begin{vmatrix} b+c & a-c & a-b \\ b-c & c+a & b-a \\ c-b & c-a & a+b \end{vmatrix} = 8abc$

44. Prove that $\begin{vmatrix} 1+a & 1 & 1 \\ 1 & 1+b & 1 \\ 1 & 1 & 1+c \end{vmatrix} = abc \left(1 + \frac{1}{a} + \frac{1}{b} + \frac{1}{c} \right)$

45. IF $A = \begin{bmatrix} 1 & 0 & 2 \\ 0 & 2 & 1 \\ 2 & 0 & 3 \end{bmatrix}$ $A^3 - 6A^2 + 7A + kI = 0$ Find k

46. Verify $\det(AB) = (\det A)(\det B)$ $A = \begin{bmatrix} 4 & 3 & -2 \\ 1 & 0 & 7 \\ 2 & 3 & -5 \end{bmatrix}$
 $B = \begin{bmatrix} 1 & 3 & 3 \\ -2 & 4 & 0 \\ 9 & 7 & 5 \end{bmatrix}$

47. The median of a triangle are concurrent
48. IF ABCD is quadrilateral and E and F the midpoint AC and BD respectively, then
 $\vec{AB} + \vec{AD} + \vec{CB} + \vec{CD} = 4 \vec{EF}$
49. Show that whole position vector $4\vec{i} + 5\vec{j} + \vec{k}$, $-\vec{j} - \vec{k}$, $3\vec{i} + 9\vec{j} + 4\vec{k}$, $-4\vec{i} + 4\vec{j} + 4\vec{k}$ coplaner.
50. Show that $5\vec{i} + 6\vec{j} + 7\vec{k}$, $7\vec{i} - 8\vec{j} + 9\vec{k}$, $3\vec{i} + 20\vec{j} + 5\vec{k}$ are coplaner.

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