

VICTORY TUITION CENTRE, CBE-25 REVISION TEST 2 (VOLUME - I)**CLASS:XII****MATHEMATICS****MARKS:70****I ANSWER ANY 7 Q.NO 10 IS COMPULSORY****7X2=14**

- Find the rank of $\begin{bmatrix} 2 & 0 & -7 \\ 0 & 3 & 1 \\ 0 & 0 & 1 \end{bmatrix}$ which is in row-echelon form
- Simplify $i^{59} + \frac{1}{i^{59}}$
- If $\omega \neq 0$ is a cube root of unit. Show that $(1-\omega + \omega^2)^6 + (1 + \omega + \omega^2)^6 = 128$
- Show that the equation $2x^2 - 6x + 7 = 0$ cannot satisfy by any real value of x
- For what value of x does $\sin x = \sin^{-1} x$?
- Find $\cos^{-1}(-\frac{1}{\sqrt{2}})$
- If $y = 4x + c$ is a tangent to the circle $x^2 + y^2 = 9$ find c
- Find the equation of the tangent at $t=2$ to the parabola $y^2 = 8x$ (Hint: use parametric form)
- If $2\hat{i} - \hat{j} + 3\hat{k}$, $3\hat{i} + 2\hat{j} + \hat{k}$, $\hat{i} + m\hat{j} + 4\hat{k}$ are coplanar, find the value of m
- Find the vector equation of a plane which is at a distance of 7 units from the origin having (3,-4,5) as direction ratio of a normal to it.

II ANSWER ANY 7 Q.NO 20 IS COMPULSORY**7X3=21**

- If $[a] = \begin{bmatrix} \cos a & 0 & \sin a \\ 0 & 1 & 0 \\ -\sin a & 0 & \cos a \end{bmatrix}$ show that $[F(a)]^{-1} = f(-a)$
- Solve by Cramer's rule $5x - 2y + 16 = 0$, $x + 3y - 1 = 0$
- Find the value of the real numbers x and y if the complex number $(2+i)x + (1-i)y + 2i - 3$ and $x + (-1+2i)y + 1 + i$ are equal.
- The complex numbers u,v,w are related $\frac{1}{u} = \frac{1}{v} + \frac{1}{w}$. If $v = 3 - 4i$, $w = 4 + 3i$, find u in rectangular form
- Obtain the condition that the roots of $x^3 + px^2 + qx + r = 0$ are in A.P
- Find the domain of $\cos^{-1}(\frac{2 + \sin x}{3})$
- If the equation $3x^2 + (3-P)xy + qy^2 - 2px = 8pq$ represents a circle. Find p and q. also determine the centre and radius of the circle.
- Find the equation of the parabola with vertex (-1,-2) axis parallel to y axis and passing through (3,6)

- A particle is acted upon by the forces $3\hat{i} - 2\hat{j} + 2\hat{k}$ and $2\hat{i} + \hat{j} - \hat{k}$ is displaced from the point (1,3,-1) to the point (4,-1, λ). If the work done by the forces is 16 units. Find the value of λ
- Find the angle between the straight line $\vec{r} = (2\hat{i} + 3\hat{j} + \hat{k}) + t\hat{i} - \hat{j} + \hat{k}$ and the plane $2x - y + z = 5$

III ANSWER THE FOLLOWING**7X5=35**

- Find the vector parametric, non parametric and cartesian of the plane passing through the points (-1,2,0), (2,2,-1) and parallel to the straight line $\frac{x-1}{1} = \frac{2y+1}{2} = \frac{z+1}{-1}$ (or)
 - By using Gaussian elimination method balance the chemical reaction equation $C_5H_8 + O_2 \rightarrow CO_2 + H_2O$
- If $A = \begin{bmatrix} -4 & 4 & 4 \\ -7 & 1 & 3 \\ 5 & -3 & -1 \end{bmatrix}$ $B = \begin{bmatrix} 1 & -1 & 1 \\ 1 & -2 & -2 \\ 2 & 1 & 3 \end{bmatrix}$ find the products AB and BA and hence solve the system of equations $x - y = 4$, $x - 2y - 2z = 9$, $2x + y + 3z = 1$ (or)
 - Find the cube roots of unity
- If $x = x + iy$ and $\arg(\frac{z-i}{z+2}) = \frac{\pi}{4}$ show that $x^2 + y^2 + 3x - 3y + 2 = 0$ (or)
 - Solve the equation $(x-2)(x-7)(x-3)(x+2) + 19 = 0$
- Solve $6x^4 - 35x^3 + 62x^2 - 35x + 6 = 0$ (or)
 - for ellipse $4x^2 + y^2 + 24x - 2y + 21 = 0$. Find the centre, vertices, foci and length of latus rectum.
- A rod of length 1.2m moves with its ends always touching the coordinates axis. The locus of a point P on the rod, which is 0.3m from the end in contact with x axis is an ellipse find the eccentricity. (or)
 - Find the value of $\cot^{-1}(1) + \sin^{-1}(-\frac{\sqrt{3}}{2}) - \sec^{-1}(-\sqrt{2})$
- Find the number of solutions of the equation $\tan^{-1}(x-1) + \tan^{-1}x \tan^{-1}(x+1) = \tan^{-1}(3x)$ (or)
 - Find the equation of the circle passing through the points (1,1), (2,-1), (3,2)
- Show that the straight lines $x+1=2y=-12z$ and $x=y+2=6z-6$ are skew and hence find the shortest distance between them (or)
 - Using vector method show that $\sin(\alpha + \beta) = \sin\alpha\cos\beta + \cos\alpha\sin\beta$