QUESTION BANK

BASIC MATHEMATICS (I Scheme - 22103)

UNIT-1 ALGEBRA 2 – Marks

1) Evaluate the determinant : D = $\begin{vmatrix} -1 & 3 & 2 \\ 4 & 1 & 2 \\ 1 & 0 & -5 \end{vmatrix}$.

2) Show that the matrix A = $\begin{bmatrix} 1 & 2 \\ 3 & -2 \end{bmatrix}$ is a non singular matrix.

3) Resolve into partial fraction : $\frac{1}{x^2-1}$

4) Simplify : $\frac{1}{2}\log 9 + \frac{1}{3}\log 27$

5) If A = $\begin{bmatrix} 6 & 3 \\ 2 & 1 \end{bmatrix}$ and B = $\begin{bmatrix} 0 & -1 \\ 3 & -2 \end{bmatrix}$ Obtain 3A - 2B

6) Find the area of the triangle whose vertices are (4,7) , (1,3) and (5,1).

7) Evaluate : $\log_2 (\frac{1}{256})$

8) Find the value of x if $\begin{vmatrix} x & 4 & -4 \\ 3 & -2 & 1 \\ -2 & -4 & 4 \end{vmatrix} = 0$.

9) Resolve into partial fractions : $\frac{x+4}{(x-1)(x+3)}$

10) Find the unknown matrix **X** if 2X+3A-2B = 0 if A = $\begin{bmatrix} 2 & 3 \\ -1 & 4 \end{bmatrix}$, B = $\begin{bmatrix} -1 & 2 \\ 0 & 1 \end{bmatrix}$

UNIT -2 TRIGONOMETRY 2 -Marks

11) Evaluate without using calculator: cos (930°)

12) Evaluate without using calculator sin (-330°)

UNIT -1 ALGEBRA 4- Marks

1) Calculate the voltages in an electrical circuit consisting of the following equations:

$V_1 + V_2 + V_3 = 9$; $V_1 - V_2 + V_3 = 3$; $V_1 + V_2 - V_3 = 1$

2) Solve the following system of equations using Cramer's rule:

x + y + z - 6 = 0 ; 2x + y – 2z +2 = 0 ; x + y – 3z + 6 = 0

3) Express the matrix A = $\begin{bmatrix} 4 & 2 & -3 \\ 1 & 3 & -6 \\ -5 & 0 & -7 \end{bmatrix}$ as the sum of Symmetric and Skew-symmetric matrix

4) If the matrix A = $\begin{bmatrix} 2 & 4 & 4 \\ 4 & 2 & 4 \\ 4 & 4 & 2 \end{bmatrix}$ then show that A^2 - 4A is a scalar matrix

5) Compute the values of x and y if $\left\{3\begin{bmatrix}4 & 1 & 3\\0 & -1 & 3\end{bmatrix}-2\begin{bmatrix}3 & 2 & 4\\-6 & 1 & -3\end{bmatrix}\right\}\begin{bmatrix}1\\3\\-2\end{bmatrix}=\begin{bmatrix}x\\y\end{bmatrix}$

6)Find A^{-1} for the matrix $A=\begin{bmatrix}4 & 2 & -3\\1 & 3 & -6\\-5 & 0 & -7\end{bmatrix}$

7) Show that the matrix $A=\frac{1}{3}\begin{bmatrix}-1 & 2 & 2\\2 & -1 & 2\\2 & 2 & -1\end{bmatrix}$ is an orthogonal matrix

8) Compute the inverse of matrix $A=\begin{bmatrix}1 & 1 & 1\\3 & -2 & 3\\5 & 5 & 1\end{bmatrix}$

9) Resolve into partial fractions : $\frac{2x+1}{x^2(x+1)}$

10) Resolve into partial fractions : $\frac{x-5}{(x^3+x^2-6x)}$

11) Resolve into partial fractions : $\frac{3x^2+17x+14}{(x^3-8)}$

12) Resolve into partial fractions : $\frac{4x^2+x-1}{x^3-x}$

13)Resolve into partial fractions : $\frac{x^2-1}{(x^2+1)(x^2+2)}$

14) Resolve into partial fractions : $\frac{3x+2}{(x+1)(x^2-1)}$

15) Apply basic laws of logarithm to determine the value of x if $\log_2(x)+\log_4(x)=2$

16) Determine the value of x if $\log_{49}[\log_2(5x-2)]=\frac{1}{2}$

17) Show that $\frac{1}{\log_a bc+1}+\frac{1}{\log_b ac+1}+\frac{1}{\log_c ab+1}=1$

18)Apply basic laws of logarithm to solve equation : $\log_2(x)-\log_2(x-1)=5$

UNIT -2 TRIGONOMETRY 4 -Marks

19) Evaluate: $\frac{\sin(90-\theta)}{\sin(270+\theta)}+\frac{\sin(180-\theta)}{\sin(-\theta)}$

20) Evaluate: $\cos(510°)\times\cos(585°)$

21)Simplify : $\frac{\cos^2(180°-\theta)}{\sin(-\theta)}+\frac{\cos^2(270°+\theta)}{\sin(180°+\theta)}$