* Question Bank for Unit Test-I. *

Q.1> 2 marks each.

(i) Solve : $\log\left(\frac{2}{3}\right) + \log\left(\frac{4}{5}\right) - \log\left(\frac{8}{15}\right)$

(ii) Prove That: $\frac{1}{\log_3 6} + \frac{1}{\log_8 6} + \frac{1}{\log_9 6} = 3.$

(iii) If $p^2 + q^2 = 7pq$ Then Show That

$$\log\left(\frac{p+q}{3}\right) = \frac{1}{2}(\log p + \log q)$$

(iv) Find the value of x if $\log_3(x+5) = 4.$

(v) Find the value of $\log_5 625$

(vi) if $A = \begin{bmatrix} 5 & 3 \\ -1 & 1 \end{bmatrix}$ & $B = \begin{bmatrix} 2 & -1 \\ 3 & 2 \end{bmatrix}$ Find $2A - 3B.$

(vii) if $A = \begin{bmatrix} 2 & 3 \\ 4 & 7 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 3 \\ 4 & 6 \end{bmatrix}$ Find $2A + 3B - 4I$

(viii) if $A = \begin{bmatrix} 4 & 2 \\ 8 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 6 \\ -4 & -12 \end{bmatrix}$;

Show That AB is null matrix.

(ix) if $A = \begin{bmatrix} 1 & -5 \\ 6 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$ Then

Find $AB - 2I$, I is identity matrix.

(x) if $A = \begin{bmatrix} 1 & 2 \\ 5 & 3 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 6 \\ -3 & 4 \end{bmatrix}$ Find $(AB)^T.$

(xi) write definition of orthogonal, singular & non-singular matrix & give its examples

Q.27 4 marks each.

(i) If $A = \begin{bmatrix} 0 & 1 & -1 \\ 4 & -3 & 4 \\ 3 & -3 & 4 \end{bmatrix}$ prove that $A^2 = I$

(ii) Find x and y if

$$\left\{4\begin{bmatrix} 1 & 2 & 0 \\ 2 & -1 & 3 \end{bmatrix} - 2\begin{bmatrix} 1 & 3 & 1 \\ 2 & -3 & 4 \end{bmatrix}\right\}\begin{bmatrix} 2 \\ 0 \\ 1 \end{bmatrix} = \begin{bmatrix} x \\ y \end{bmatrix}$$

(iii) if $A = \begin{bmatrix} 2 & 4 & 4 \\ 4 & 2 & 4 \\ 4 & 4 & 2 \end{bmatrix}$ show that, $A^2 - 8A$ is a scalar matrix.

(iv) if $A = \begin{bmatrix} -2 & 0 & 2 \\ 3 & 4 & 5 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 1 \\ 3 & 5 \\ 0 & 2 \end{bmatrix}$ verify that AB is singular or non-singular.

(v) Express the matrix A as the sum of symmetric & skew-symmetric matrices.

where $A = \begin{bmatrix} -1 & 7 & 1 \\ 2 & 3 & 4 \\ 5 & 0 & 5 \end{bmatrix}$

(vi) if $A = \begin{bmatrix} 2 & -1 & 3 \\ 4 & 1 & -3 \\ 0 & -1 & 1 \end{bmatrix}$ Find $|A|$ & verify A is singular or non-singular matrix.

(vii) Show that $A = \begin{bmatrix} \cos\theta & 0 & \sin\theta \\ 0 & 1 & 0 \\ -\sin\theta & 0 & \cos\theta \end{bmatrix}$ is an orthogonal matrix.

(viii) Find the Adjoint of matrix A if

$$A = \begin{bmatrix} 2 & 5 & 3 \\ 3 & 1 & 2 \\ 1 & 2 & 1 \end{bmatrix}$$

(ix) Find the inverse of matrix by Adjoint method : If

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 5 \\ 3 & 5 & 6 \end{bmatrix}$$

(x) Solve the following equations by matrix inversion method

$$x + y + z = 3$$
$$3x + 2y + 3z = 4$$
$$5x + 5y + z = 11$$

(xi) Resolve into partial fractions:

$$\frac{2x + 3}{x^2 - 2x - 3}$$