**GLS UNIVERSITY**
**Faculty Of Computer Applications & Information Technology**
**Integrated IMScIT Programme**
**221601104 Mathematics for Computer Science**
**Assignment-II -Unit-2 Introduction to Matrix and Vectors**

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| 1 | Define the following terms with suitable example.<br>➢ Zero vector<br>➢ Unit vector<br>➢ Parallel vectors<br>➢ Matrix<br>➢ Row Matrix<br>➢ Column Matrix<br>➢ Null Matrix<br>➢ Unit Matrix<br>➢ Square matrix<br>➢ Symmetric matrix<br>➢ Skew-symmetric matrix |
| 2 | Find u.v if vectors u = (1 3) and v = (4 5) |
| 3 | If $\vec{a} = (2 \quad 3 \quad -1)$ and $\vec{b} = (1 \quad -5 \quad 1)$ then find $\vec{a} - 3\vec{b}$ , $\|\|\vec{a}\|\|$ and $\|\|\vec{b}\|\|$ |
| 4 | If $\vec{a} = (1 \quad 3 \quad -4)$ , $\vec{b} = (2 \quad -5 \quad 1)$ and $\vec{c} = (0 \quad 4 \quad -2)$ Then find $\vec{a} - \vec{b} + \vec{c}$ , $3\vec{c} - 5\vec{b}$ and a.b |
| 5 | If $A = \begin{bmatrix} 1 & 2 \\ 1 & -3 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & -1 \\ 5 & 3 \end{bmatrix}$ then find (i) $A + B$ (ii) 3A |
| 6 | If $A = \begin{pmatrix} 1 & 9 \\ 3 & 4 \\ 8 & -3 \end{pmatrix}$, $B = \begin{pmatrix} 5 & 7 \\ 3 & 3 \\ 1 & 0 \end{pmatrix}$ then verify that<br>(i) $A + B = B + A$ (ii) $A + (-A) = (-A) + A = O$. |
| 7 | If $A = \begin{pmatrix} 4 & 3 & 1 \\ 2 & 3 & -8 \\ 1 & 0 & -4 \end{pmatrix}$, $B = \begin{pmatrix} 2 & 3 & 4 \\ 1 & 9 & 2 \\ -7 & 1 & -1 \end{pmatrix}$ and $C = \begin{pmatrix} 8 & 3 & 4 \\ 1 & -2 & 3 \\ 2 & 4 & -1 \end{pmatrix}$ then verify that<br>$A + (B + C) = (A + B) + C$. |
| 8 | Find $X$ and $Y$ if $X + Y = \begin{pmatrix} 7 & 0 \\ 3 & 5 \end{pmatrix}$ and $X - Y = \begin{pmatrix} 3 & 0 \\ 0 & 4 \end{pmatrix}$ |
| 9 | If $A = \begin{pmatrix} 0 & 4 & 9 \\ 8 & 3 & 7 \end{pmatrix}$, $B = \begin{pmatrix} 7 & 3 & 8 \\ 1 & 4 & 9 \end{pmatrix}$ find the value of (i) $B - 5A$ (ii) $3A - 9B$ |

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| 10 | Find the values of $x,\ y,\ z$ if (i) $\begin{pmatrix} x-3 & 3x-z \\ x+y+7 & x+y+z \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 1 & 6 \end{pmatrix}$<br>(ii) $(x \quad y-z \quad z+3)+(y \quad 4 \quad 3) = (4 \quad 8 \quad 16)$ |
| 11 | Find $x$ and $y$ if $x\begin{pmatrix} 4 \\ -3 \end{pmatrix} + y\begin{pmatrix} -2 \\ 3 \end{pmatrix} = \begin{pmatrix} 4 \\ 6 \end{pmatrix}$ |
| 12 | Multiply the given Matrices:<br>**(a)** $\begin{pmatrix} 4 & 2 \\ -3 & 5 \end{pmatrix}\begin{pmatrix} 7 \\ 1 \end{pmatrix}$ **(b)** $\begin{pmatrix} 5 & 0 \\ 0 & 5 \end{pmatrix}\begin{pmatrix} -3 \\ -4 \end{pmatrix}$ **(c)** $2\begin{pmatrix} 5 & -2 \\ 6 & -3 \end{pmatrix}$<br>**(d)** $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}\begin{pmatrix} 3 \\ -2 \end{pmatrix}$ **(e)** $6\begin{pmatrix} -4 & 7 \\ -1 & -3 \end{pmatrix}$ **(f)** $\begin{pmatrix} 8 & 4 \\ 4 & 2 \end{pmatrix}\begin{pmatrix} -3 \\ 6 \end{pmatrix}$ |
| 13 | $\mathbf{P} = \begin{pmatrix} -2 & 0 \\ 5 & 1 \end{pmatrix}$ $\mathbf{Q} = \begin{pmatrix} -4 & 1 \\ 3 & -2 \end{pmatrix}$ $\mathbf{C} = \begin{pmatrix} 3 \\ -2 \end{pmatrix}$<br>**(a)** $\mathbf{P}^2$ **(b)** $\mathbf{QP}$ **(c)** $5\mathbf{Q}$<br>**(d)** $\mathbf{PC}$ **(e)** $\mathbf{IQ}$ **(f)** $3\mathbf{I}$ |
| 14 | If $A = \begin{bmatrix} 10 & -3 & 1 \\ 1 & 1 & 4 \\ 0 & 2 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 3 & 2 \\ 7 & 0 & 9 \\ 11 & 1 & 2 \end{bmatrix}$ then find $(3A - 5B + AB)^T$ |
| 15 | If $A = \begin{bmatrix} 1 & 3 & -5 \\ 3 & 11 & 54 \\ -5 & 54 & 22 \end{bmatrix}$ then check whether the given matrix is symmetric or not? Justify your answer. Then evaluate $AB$ if $B = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$. |
| 16 | If $A = \begin{bmatrix} 0 & 3 & 5 \\ -3 & 0 & -4 \\ -5 & 4 & 0 \end{bmatrix}$ then check whether the given matrix is skew-symmetric or not? Justify your answer. Then evaluate $AB$ if $B = \begin{bmatrix} 1 \\ 1 \\ 2 \end{bmatrix}$. |
| 17 | $\begin{pmatrix} -2 & a \\ -4 & 3 \end{pmatrix}\begin{pmatrix} 3 \\ 7 \end{pmatrix} = \begin{pmatrix} 22 \\ 9 \end{pmatrix}$<br>Work out the value of $a$. |