

**Q.1 Multiple Choice Questions****[05]**

1. A Square matrix A is said to be symmetric if _____
(a) $A \neq A^T$ (b) $A = -A^T$ (c) $A = A^T$ (d) None
2. Dot product of $u = (1, 2, 3)$, $v = (0, -1, 4)$ is _____
(a) 14 (b) $(0, -2, 12)$ (c) $(1, 1, 7)$ (d) 10
3. Edges connecting the same end points are called
(a) trivial graph (b) multigraph (c) loops (d) multiple edges
4. An Edge whose endpoints are the same vertex is called
(a) trivial graph (b) multigraph (c) loops (d) multiple edges
5. Mode of the observations 2, 5, 8, 4, 4, 5, 4, 6, 3, 4, 4 is _____
(a) 3 (b) 7 (c) 4 (d) None

Q.2 Fill in the Blanks**[04]**

1. If $A = 4(1, 2, 1)$ and $B = 2(1, 3, 3)$ = then $A+B =$ _____
2. Norm of the vector $u = (3, 0, 4)$ is _____
3. The value which occurs with the maximum frequency is called _____
4. A tree with 10 vertices has number of edges

Q.3 Write a short answer for given questions (5 out of 7)**[10]**

1. Define Vector with example.
2. Define Dot Product with example.
3. Define Graph, Multigraph.
4. Define Trial graph, null graph.
5. Define Mode, Median and Mean
6. Find the Mean of 2, 4, 8, 12, 16 and 24.
7. What is central tendency? Give its different measures

(P. T. O.)

(1)

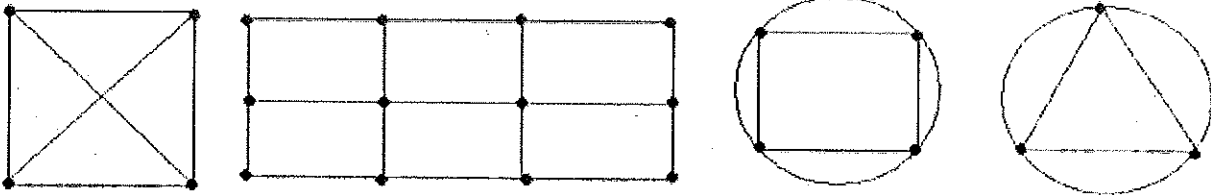
Q.4 Long Questions Answers (4 out of 8)

[16]

1. If $u = (1, 4, 3)$, $v = (-5, -2, 5)$, then evaluate (1) $u+2v$ (2) $u \cdot v$ (3) $\|u\|$ (4) $\|2u-v\|$ (5) $\|3u+4v\|$
2. Verify that the matrix is orthogonal.

$$\frac{1}{3} \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & -2 \\ -2 & 2 & -1 \end{bmatrix}$$

3. Draw a diagram of the complete graphs $K_1, K_2, K_3, K_4, K_5, K_6$
4. Find the number m of edges in the graphs: 1) K_{120} 2) K_{200} 3) K_{15} 4) K_{24}
5. Verify Euler's Formula for given graph.



6. Find the chromatic index of the graph G where G is:



7. Find the mean and median for the following distribution.

Marks	0-10	10-20	20-30	30-40	40-50
No. of Students	5	7	15	25	8

8. Find the median & mode of the given data:

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No. of Students	2	5	8	16	9	5

