Seat No.	

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Kamala College, Kolhapur

(Autonomous)

B.C.A. (Part-I) (Semester-I)

Examination March/April, 2024.

NEP - 2020 Level - 4.5

Maths-II

Subject Code: OE 110

Day and Date: Monday, 15/04/2024 **Total Marks: 40**

Time: 12:00 pm to 02:00 pm

Instructions:
1. **Que. 1 is compulsory.**
2. **Attempt any four questions from Que. 2 to Que. 7.**
3. **Figures to the right indicate full marks**

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Que-1) Select the correct alternative and rewrite the statement. **(08)**

1) If the matrix, A = [3 6 1] and the matrix B = $\begin{bmatrix} 2 \\ 5 \\ -8 \end{bmatrix}$ then AB is ____?

a) 28 b) 45 c) -40 d) 46

2) A diagonal matrix having all of its elements are equal is called _____ matrix.

a) unit b) null c) scalar d) singular

3) The contribution of loop towards degree of the corresponding vertex is _____

a) 0 b) 1 c) 2 d) ∞

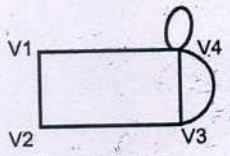
4) If $A = \begin{bmatrix} 2 & -1 \\ 3 & 5 \\ 7 & 4 \end{bmatrix}$ *then* $A^T =$ – – – – –

a) $\begin{bmatrix} -1 & 2 \\ 5 & 3 \\ 4 & 7 \end{bmatrix}$ b) $\begin{bmatrix} 3 & 5 \\ 2 & -1 \\ 7 & 4 \end{bmatrix}$ c) $\begin{bmatrix} 2 & 3 & 7 \\ -1 & 5 & 4 \end{bmatrix}$ d) $\begin{bmatrix} -1 & 5 & 4 \\ 2 & 3 & 7 \end{bmatrix}$

5) A complete Km graph is _____

a) m-regular b) (m-1) regular

c) (m+1)-regular d) m(m-1)-regular

6) 

The degree of vertex V_4 in the adjoining multigraph is _____

a) 5 b) 4 c) 3 d) 6

7) The number of vertices in Km, n is _____
a) m+n b) m^2+n^2 c) mn d) m-n

8) *If* $\left\{\begin{bmatrix} 2 & 0 \\ -2 & 2 \end{bmatrix} - \begin{bmatrix} 3 & 0 \\ 0 & 1 \end{bmatrix}\right\}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -10 \\ 5 \end{bmatrix}$
then the values of x and y are, _____
a) x=5, y=10 b) x=-15, y=20 c) x=10, y=25 d) x=15, y=10

Q.2) Define degree of a vertex and hence explain even vertex, odd vertex, Isolated vertex and Pendant vertex with examples. **(08)**

Q.3) Define Weighted Graph. Explain **(08)**
Operations on graph, (i.e. union and complement of a graph)

Q.4) i) Find the determinant of the matrix **(04)**

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

ii) Find x and y, **(04)**

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

Q.5) Define Diagonal matrix and Identity matrix with examples And hence find the inverse of matrix (08)

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

Q.6)

i) Define simple graph and multigraph. **(04)**
ii) Apply elementary transformation for
for $A = \begin{bmatrix} 1 & 2 & -1 \\ 0 & 1 & 3 \end{bmatrix}, 2C_2$

$$B = \begin{bmatrix} 1 & 0 & 2 \\ 2 & 4 & 4 \end{bmatrix}, -3R_1$$

Find the addition of the two new matrices. (04)

Q.7) Write short notes on any TWO of the following. **(08)**
1) Regular graph and Bipartie graph.
2) Skew symmetric matrix and transpose of a matrix.
3) Walk, cycle.

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