

[1/A-2]

SEAT No. _____

No. of Printed Pages: 02



SARDAR PATEL UNIVERSITY
BCA (SEMESTER-II) EXAMINATION-2022
US02FBCA02 (Mathematics II)

Date : 27-9-2022

Time : 9:30 to 11:30 am

Marks: 70

[10]

Q. 1 Multiple Choice Questions

- 1 A vertex does not belongs to any edge is called _____
 (a) trivial graph (b) isolated vertex (c) null graph (d) finite
- 2 An Edge whose endpoints are the same vertex is called _____
 (a) trivial graph (b) multigraph (c) loops (d) multiple edges
- 3 The _____ of connected graph is the maximum distance between any two of its vertices .
 (a) diameter (b) radius (c) length (d) area
- 4 A spanning tree T of graph contains all the _____ of G
 (a) Edges (b) regions (c) colors (d) vertices
- 5 By Euler's formula, $E =$ _____
 (a) $2 - V - R$ (b) $V + R - 2$ (c) $V - R + 2$ (d) $R - V + 2$
- 6 $\binom{n}{0} + \binom{n}{n} =$ _____
 (a) n (b) 1 (c) 2 (d) 3
- 7 $P(7, 3) =$ _____
 (a) 21 (b) 12 (c) 120 (d) 210
- 8 The quartile Q_2 is coincides with
 (a) Mean (b) Mode (c) Median (d) Standard deviation
- 9 Which of the following is the superior measure of Dispersion
 (a) Range (b) Standard deviation (c) Mean deviation (d) Quartile deviation
- 10 If Karl-Pearson's coefficients of skewness $S_k = 0$ then the frequency distribution is
 (a) Not Skewed (b) Positively skewed (c) Negatively skewed (d) None of these

Q. 2 Fill in the Blanks and True or False.

[08]

- 1 A graph G is _____ if each vertex has the same degree.
- 2 A graph that can be drawn in a plane or on a sphere so that its edge do not cross is said to be _____
- 3 Four persons out of five persons can be arranged in a row in _____ ways
- 4 A square of _____ is called Variance.
- 5 The number of edges in the complete graph K_{12} is 66 (True/False)
- 6 The chromatic number of graph K_{120} is $\chi(K_{120}) = 120$ (True/False)
- 7 $0! + 1! = 2$ (True/False)
- 8 Range of the Bowley's coefficient of skewness is -1 to 1 (True/False)

Q. 3 Answer the Following.(Any 10)

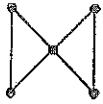
[20]

- 1 Draw a picture of each of the following graphs, and state whether or not it is simple.
 (a) $G_1 = (V_1, E_1)$, where $V_1 = \{a, b, c, d, e\}$ and $E_1 = \{ab, bc, ac, ad, de\}$.
 (b) $G_2 = (V_2, E_2)$, where $V_2 = \{P, Q, R, S, T\}$ and $E_2 = \{PQ, PR, PS, PT, TR, PR\}$.
- 2 Define the following terms:
 (1) simple path (2) trail
- 3 Draw a diagram of the complete graphs K_4 and K_5 .
- 4 What do you mean by the chromatic number of the graph? Find the chromatic number of K_{20} .

(1)

[P.T.O.]

5 Draw all the spanning trees of this graph:



6 State Euler's formula with atleast two examples which verifies it.

7 Find the number of distinct permutation that can be formed from all the letters of the word (1) RADAR (2) UNUSUAL

8 Find the number of "three-letter words" using the six letters A, B, C, D, E and F without repetition

9 Find n , if (i) $P(n, 2) = 72$

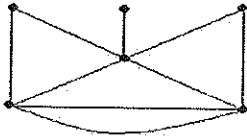
10 Define the quartiles Q_1 and Q_3 .

11 Define range and quartile deviation

12 If the quartiles $Q_1 = 62$, $Q_2 = 142$ and $Q_3 = 195$, then find the Bowley's coefficient of skewness.

Q.4 Answer the Following.(Any 4)

1 Find the incidence matrix and adjacency matrix for the following

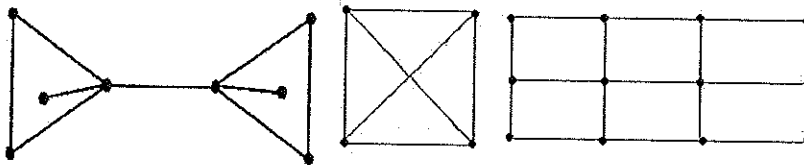


2 Draw the graph G corresponding to each adjacency matrix given below.

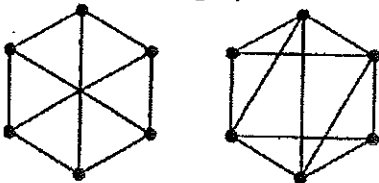
$$A = \begin{pmatrix} 1 & 3 & 0 & 0 \\ 3 & 0 & 1 & 1 \\ 0 & 1 & 2 & 2 \\ 0 & 1 & 2 & 0 \end{pmatrix}$$

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3 Verify Euler's formula for the following graphs



4 Define: Planar graph. Checks which of the following are planar graphs. Justify.



5 Write in terms of factorial

(a) $n(n-1)(n-2)\dots(n-r+1)$ (b) $\frac{n(n-1)(n-2)\dots(n-r+1)}{1 \cdot 2 \cdot 3 \dots (r-1)r}$

6 Find the number of distinct permutation that can be formed from all the letters of the word MISSISSIPPI. Also find the number of distinct permutation if the words are to begin with I.

7 Following table shows the frequency distribution of marks.

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No. of students	12	18	27	20	17	6

Find the Mean deviation from mean for above frequency distribution.

8 Frequency distribution of the blood pressure given below, Compute the quartile Deviation of the frequency distribution.

Systolic BP (mm Hg)	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90
No. of Infants	1	6	14	43	21	13	10	1