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SEAT No._____

[13/A5]

No of printed pages : 4

SARDAR PATEL UNIVERSITY
BCA (SEMESTER - II) EXAMINATION - 2018
Monday , 26th March,2018
MATHEMATICS : US02FBCA02
(Mathematics - II)

Time : 10:00 a.m. to 12:00 noon

Maximum Marks : 70

Que.1 Fill in the blanks. 10

(1) The .....of connected graph is the maximum distance between any two of its vertices .

(a) diameter (b) radius (c) length (d) area

(2) The number of edges in the complete graph K_8 is .....

(a) 4 (b) 8 (c) 16 (d) 28

(3) The complete graph K_n $(n > 2)$ is not traversable if n is .....

(a) 5 (b) prime (c) even (d) odd

(4) In a connected map with V = 5, R = 3 then E = ...

(a) 2 (b) 6 (c) 4 (d) 3

(5) A tree consist of one vertex and no edges is known as .....

(a) acyclic (b) cyclic (c) spanning tree (d) degenerate tree

(6) In a map, the total degrees of the regions = ...

(a) 3e (b) e (c) 2e+e (d) 2e

(7) Four persons out of five persons can be arranged in a row in ..... ways .

(a) 5 (b) 10 (c) 120 (d) 24

(8) $\binom{12}{10}$ = ...

(a) 12 (b) 120 (c) 10 (d) 66

(9) If the Karl-Pearsons correlation coefficient r = 1, then the correlation is .....

(a) Zero correlation (b) Perfect Positive (c) Perfect Negative (d) Partial Positive

(10) The relation between correlation coefficient and regression coefficients is .....

(a) $r = \pm\sqrt{b_{XY} + b_{YX}}$ (b) $r = \frac{b_{XY} + b_{YX}}{2}$ (c) $r = \pm\sqrt{b_{XY} b_{YX}}$ (d) None of these

Que.2 Answer the following (Any Ten) 20

(1) Define : trivial graph and diameter of a graph with example.

(2) Define : parity of a vertex and subgraph with example.

(3) Draw a picture of graph G = (V,E), where $V = \{a, b, c, d, e\}$; $E = \{ab, bc, ac, ad, de\}$. Is it simple ?

(4) Find the edges E using Eulers formula for the connected planar multigraphs having vertices V =32 and regions R=14 .

CP-T.O.)

(5) Find the vertices V using Eulers formula for the connected planar multigraphs having edges E = 10, and regions R=8 .

(6) Let T be a tree with at least 2 vertices. Prove that $\chi(T) = 2$.

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

(8) Prove that $\binom{12}{7} = \binom{11}{6} + \binom{11}{7}$.

(9) Find the number of automobile license plates where: (a) Each plate contains 2 different letters followed by 3 different digits. (b) The first digit cannot be 0 .

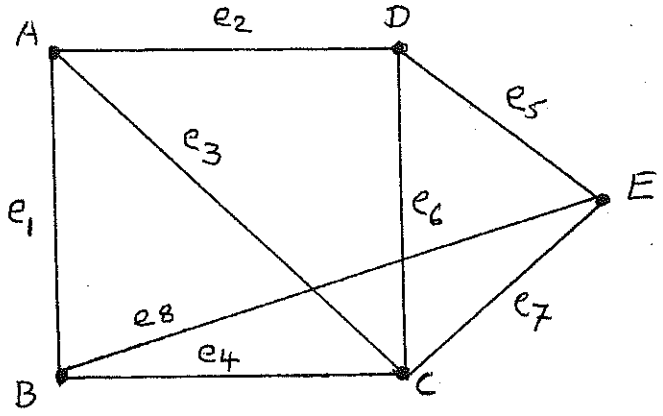
(10) Define Standard deviation and Variance.

(11) Find standard deviation of the observation 1, 2, 3, 4, 5, 6, 7, 8 .

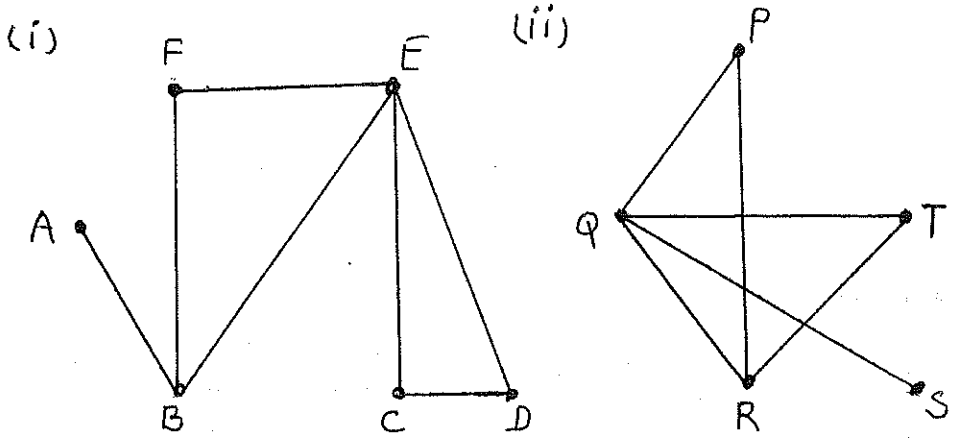
(12) Find quartile deviation for the data

Xi	0	1	2	3	4	5	6
Fi	5	7	10	8	7	8	5

Que.3 (a) Find the incidence matrix and adjacency matrix for the following graph . 5



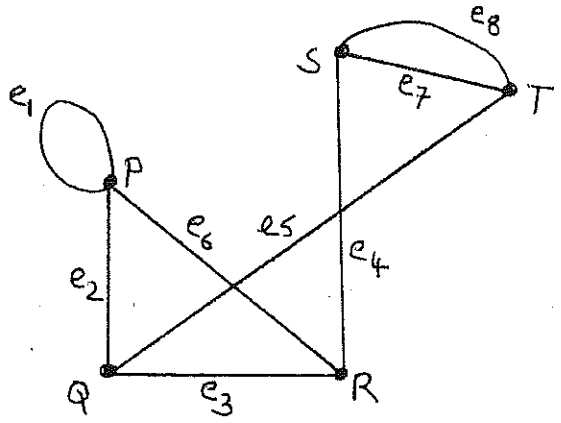
(b) Define bridge and cut points. Find bridge and cut points for the following graph. 5



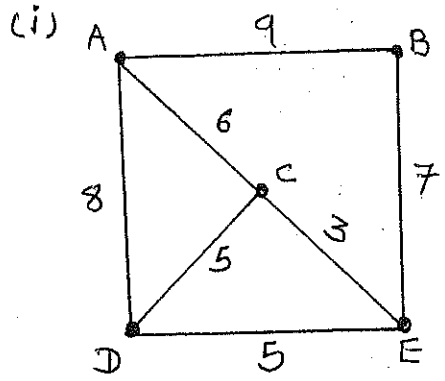
OR

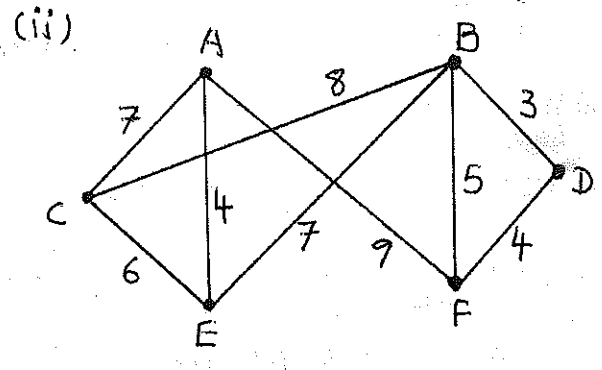
Que.3 (c) Draw the graph of $K_{2,5}$ and K_5. 5

(d) Find the incidence matrix and adjacency matrix for the following graph. 5

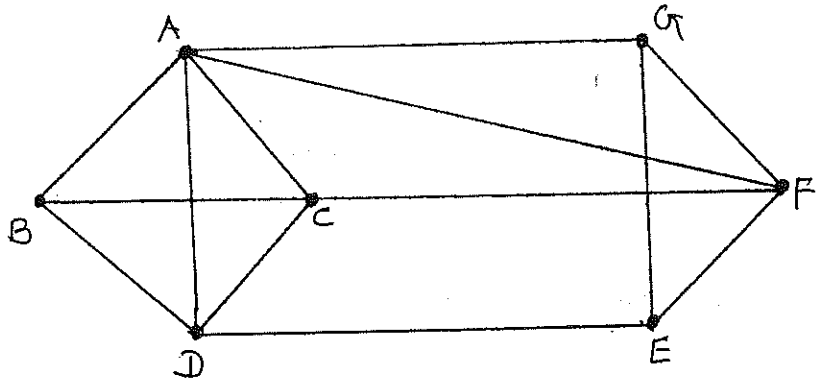


Que.4 (a) Find the number of spanning trees in each of the following graphs.Also find minimal spanning tree . 5



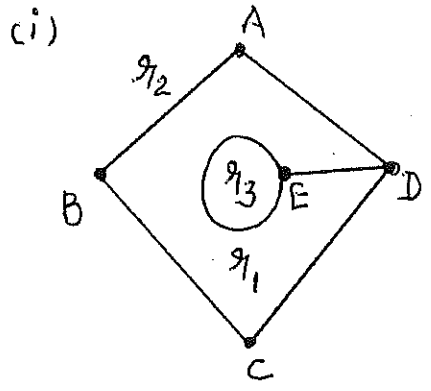


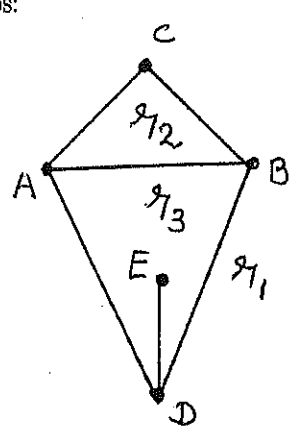
(b) What do you mean by the chromatic number of the graph? Determine the chromatic number of each of the following graphs . 5



OR

Que.4 (c) Identify cycle or closed path that borders each region of the following map. Also find the degree of each region and chromatic number of the following maps: 5





(P.T.O.)

(d) Let G be a connected planar graph (not a multigraph) with p vertices and q edges then prove that $q \leq 3p - 6$, where $p \geq 3$. 5

Que.5 (a) Prove that $n_{C_r} = \frac{n!}{r!(n-r)!}$. 5

(b) Find the number m of Permutations that can be formed all the letters of the word MISISSIPPII. Also find the number of distinct permutation 5
(i) if the word are to begin with an I.
(ii) if the word are to begin and end with in S.

OR

Que.5 (c) Suppose repetitions are not permitted , find the number of three-digit numbers that can be formed from the six digits 2, 3, 5, 6, 7, and 9.
(i) How many of them are less than 600 ? (ii) How many of them are even ? 5

(d) There are twelve points $A, B, ..., L$ in a given plane, no three on the same line 5
(i) how many triangles are determined by the points ?
(ii) how many of these triangles contain the point A as vertex ?

Que.6 (a) Frequency distribution of the blood pressure given below, Compute the quartile Deviation of the frequency distribution. 5

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

(b) Given below is the frequency distribution of the marks obtained by 90 students. Compute the standard deviation. 5

Marks	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99
No. of students	5	12	15	20	18	10	6	4

OR

Que.6 (c) Find regression equations (i) x on y (ii) y on x, from the following data. 5

x	10	6	9	10	12	13	11	9
y	9	4	6	9	11	13	8	4

(d) Given $\sum x = 125, \sum y = 100, \sum x^2 = 650, \sum y^2 = 436, \sum xy = 520$ and $n = 25$
Obtain the value of Karl Pearsons coefficient of correlation r. 5