(A-30) Seat No: _____ No. of Printed Pages : 4

SARDAR PATEL UNIVERSITY

BCA Sem-II(NC) EXAMINATION

2016

MONDAY, 2nd May

02.30 pm to 04.30 pm

SUBJECT: MATHEMATICS-II (US02FBCA02)

Maximum Marks: 70

Q:1 Choose the correct option in the following, mention the correct option with the answers in the answer book. [10]

(1) In a map with e- edges, the total degrees of the regions = _____

(a) 3e (b) e (c) 0 (d) 2e

(2) The quartile Q_2 is coincides with

(a) Mean (b) Mode (c) Median (d) Standard deviation

(3) A graph G is____ if each vertex has the same degree.
(a) disconnected (b) regular (c) complete (d) connected

(4) Chromatic number is the _____ number of color required to paint graph G.

(a) total (b) average (c) minimum (d) maximum

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

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

(6) A path in graph is ____ if all the vertices are distinct.

(a) trail (b) simple (c) cycle (d) degree

(7) A spanning tree T of graph contains all the _____ of G

(a) edges (b) regions (c) colors (d) vertices

(8) If restaurant has 6 different desserts, then customer can choose 2 of the desserts in ..... ways

(a) 6 (b) 15 (c) 4 (d) 12

(9) We can select four objects from the given 9 objects in..... ways.

(a) $\binom{9}{5}$ (b) $\binom{9}{4}$ (c) $\frac{9!}{4!}$ (d) $\frac{9!}{5!}$

(10) A square of ..... is called Variance

(a) Range (b) Mean deviation
(c) Standard deviation (d) Quartile deviation

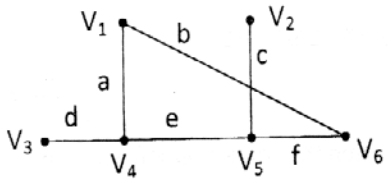
(P.T.O.)

Q:2 Answer the following in short (**Attempt any Ten**). [20]

(1) Define the quartiles Q_1 and Q_3.

(2) What do you mean by the chromatic number of the graph? Find the chromatic number of K_{12}.

(3) Find cut-vertices and bridges of a graph :



(4) Explain the positive correlation with two examples.

(5) Define complete graph. Is K_4 Complete?

(6) Define region of a map and degree of a region by giving example of each.

(7) A class contains 10 students with 6 men and 4 women. Find the number n of ways to select a 4-member committee with 2 men and 2 women.

(8) Find the number n of distinct permutations that can be formed from all the letters of each word UNUSUAL.

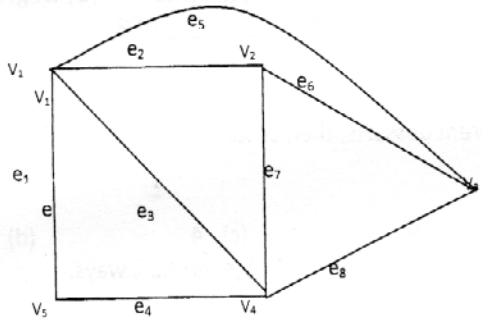
(9) Draw all the different spanning trees of a graph:

(10) Draw a connected map of a graph with 4 vertices and 5 regions.

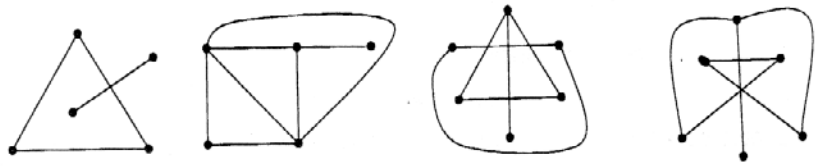
(11) Find variance of the following observations: 7, 7, 7, 7, 7, 7, 7, 7.

(12) Draw 3-regular graph with 6-vertices.

Q:3(a) Find the incidence matrix and adjacency matrix for the following Graphs: [5]

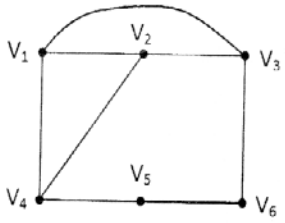


(b) Define connected graph. Which of the following graphs are Connected? [5]



OR

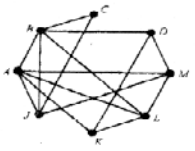
Q:3(c) Consider the graph G as [5]



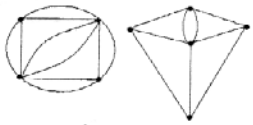
(i) Find all simple paths from v_1 to v_6.
(ii) Find all trails from v_1 to v_6.
(iii) Find d (v_1 , v_5).
(iv) Find all cycles in G.

(d) Draw a multigraph whose adjancey matrix is A= $\begin{bmatrix} 1 & 1 & 2 & 0 \\ 1 & 2 & 1 & 3 \\ 2 & 1 & 0 & 1 \\ 0 & 3 & 1 & 0 \end{bmatrix}$ [5]

Q:4(a) Define coloring of a graph. Find chromatic number for the following graph using Welch-Powell algorithm: [5]



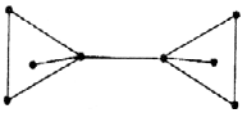
(b) Paint the following maps with minimum number of colors: [5]



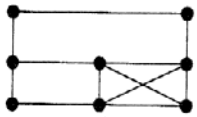
OR

Q:4(c) Describe Welch-Powell algorithm for painting a graph and give one example of it. [5]

(d) State Euler's formula for planar graph. Verify Euler's formula for the following graphs: [5]



(i)



(ii)

Q:5(a) Simplify: (1) $\frac{(n-r+1)!}{(n-r-1)!}$ (2) $\frac{(n-1)!}{(n+2)!}$ [5]

(b) Suppose repetitions are not permitted. (a) Find the number of three-digit numbers that can be formed from the six digits 2, 3, 5, 6, 7, and 9. (b) How many of them are less than 400? (c) How many of them are even? [5]

OR

Q:5(c) Find n , if (i) P(n , 2) = 72 (ii) P(n , 4) = 42 P(n , 2). [5]

(d) A class consist of seven men and five women. (i) Find the number m of committees of five that can be selected from the class (ii) Find the number m of committees of five if it consists of three men and two women. [5]

PTO

(P.T.O.)

Q:6(a) Find the standard deviation for the following frequency distribution and obtain the coefficient of variance. [5]

x:	6	7	8	9	10	11	12
f:	3	6	9	13	8	5	4

(b) Calculate Karl Pearson's coefficient of Skewness for the following data: [5]

Size	1	2	3	4	5	6	7
Frequency	10	18	30	25	12	3	2

OR

Q:6(c) Define the linear regression and state its properties. [5]

(d) 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