Seat No:-_____

B.C.A,Sem :- I
December-2016
CC-103: Mathematical Foundations

Time : 3 Hours **Marks :70**

Instructions.
1) All Questions are compulsory.
2) Answer of each question must start on a new page.
3) Answer of all sub-questions of a question should be written in continuous order.

1.(a) Given **[08]**

Compute the following:

(1) A + B

(2) A – B

(3) A + (B + C)

(4) (A –B) + C

OR

Attempt the following:

(i) Write the definition of: (a) Square matrix (b) Null matrix

(ii) If then, find AB.

(b) Find the inverse of the matrix **[06]**

OR

Solve completely the following equations:

Using matrices.

2.(a) Find the derivatives of the following: **[08]**

(i)

(ii)

(iii)

(iv)

OR

Attempt the following:

(i) If , find .

(ii) Find the derivative of with respect to .

(b)Evaluate the following: **[06]**

(i)

(ii)

(iii)

OR

Attempt the following:

(i) Find .

(ii) Find

3.(a) Attempt the following: **[08]**

(i) Calculate the mean profit of a given firm in Rs. from the following data by short cut method.

Year:	1965	1966	1967	1968	1969
Profit (Rs.):	10,612	10,610	10,600	10,625	10,638

(ii) Calculate standard deviation.

Roll no.:	1	2	3	4	5	6	7	8	9	10
Marks:	83	87	93	109	124	126	126	101	102	108

OR

Attempt the following:

(i) From the following data, find the missing value when mean is 126.3:

Salary(Rs.):	60	80	100	?	160	180	200
No. of persons:	5	8	12	22	10	7	6

(ii) Five coins are tossed 99 times and at each toss the number of heads were observed. The number of tosses during which 0, 1, 2, 3, 4, 5 heads were obtained is shown in the following table. Find the median size of the heads obtained.

No. of heads (X):	0	1	2	3	4	5	Total
No. of tosses (f):	4	15	35	29	6	10	99

(b) Attempt the following: **[06]**

(i) Calculate the co-efficient of correlation and interpret the result:

X: 28	37	40	38	35	33	40	32	34	33
Y: 23	32	33	34	30	26	29	31	34	38

(ii) Locate the median in the following data of marks obtained by 9 students in statistics:

Marks: 18	14	18	13	14	18	16	15	20

OR

Attempt the following:

(i) Calculate the mode for following distribution:

Class interval	Frequency
0-5	9
5-10	12
10-15	15
15-20	16
20-25	17
25-30	15
30-35	10
35-40	13

(ii) From the following data, find the regression equations of Y on X.

X: 1	2	3	4	5	6	7	
Y: 2	4	7	6	5	6	5	

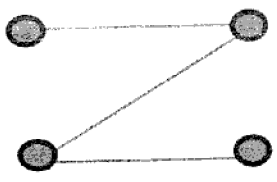
[08]

4. (a)Attempt the following:

(i) Draw a picture of following graph.

G= (V, E) where V={a, b, c, d, e} and E= {ab, bc, ac, ad, de}

(ii) Find the incidence matrix (M) and adjacency matrix (A) of the following graph:

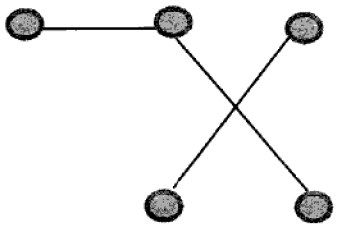


OR

Attempt the following:

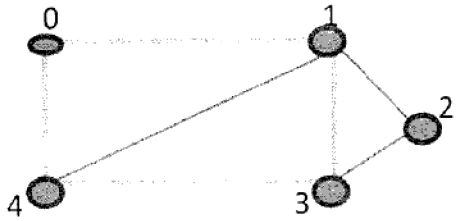
(i) Draw the graph G corresponding to adjacency matrix given below:

(ii) Find the incidence matrix (M) and adjacency matrix (A) of the following graph:



(b) Attempt the following: **[06]**

(i) Find the adjacency list of the following graph:



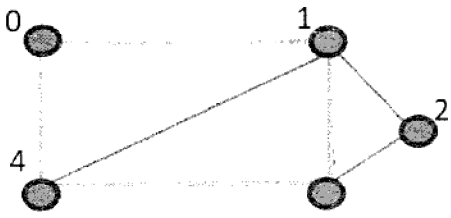
(ii) Write the definition of Graph with an example.

OR

Attempt the following:

(i) Find the number of edges in the graphs: (a)

(ii) Find the degree of all the vertices of following graph.



5. Do as directed: **[14]**

(1) Edges connecting the same end points are called _____.

(a) Trivial graph (b) multi-graph (c) loops (d) multiple edges

(2) The degree of isolated vertex is _____.
(a) Not possible (b) zero (c) two (d) one

(3) An edges whose end points are the same vertex is called _____.
(a) Trivial graph (b) multi-graph (c) loops (d) multiple edges

(4) The number of edges in the complete graph
(a)

(5) _____ refers to that value of variable which occurs with maximum frequency.
(a) Mode (b) Mean (c) median (d) standard deviation

(6)
(a) (b) (c) (d)

(7)
(a) (b) (c) (d) 1

(8)
(a) (b) (c) (d) 0

(9)
(a) (b) (c) (d)

(10) is a matrix of order _____.
(a) (b) (c) (d)

(11) Transpose of matrix will be _____.
(a) (b) (c) (d)
(12) The rank of the matrix is _____.
(a) 2 (b) 3 (c) 1 (d) 0

(13) What is the mean of test score: 43, 50, 30, 33, 41, 18 ?
(a) 35.84 (b) 35 (c) 34 (d) 35.5

(14) Find the mode of the values 4, 14, 5, 4, 3, 14, 4 and 5.
(a) 14 (b) 5 (c) 4 (d) 3