B.Com. DEGREE EXAMINATION,NOVEMBER 2018
I Year II Semester
Allied - Paper II
BUSINESS STATISTICS AND OPERATIONS RESEARCH-II

Time : 3 Hours **Max.marks :75**

Section A $(10 \times 2 = 20)$ Marks

Answer any **TEN** questions

1. What is meant by probability?
2. What is Conditional probability?
3. Explain the term 'Cluster Sampling'.
4. What do you mean by non-probability samples?
5. Describe the meaning of level of significance.
6. A sample of ten house owners is drawn and the following values of their incomes are obtained. Mean Rs.6,000; standard deviation Rs.650. Test the hypothesis that the average income of house owners of the town is Rs.5,500.
7. Solve the transportation under Least Cost Entry Method

	S1	S2	S3	a_i
W1	5	4	3	6
W2	4	7	6	8
W3	2	5	8	16
b_j	8	10	12	

8. Solve the transportation under North West Corner Method

	X	Y	Z	a_i
A	8	8	9	7
B	3	6	7	9
C	5	6	8	10
b_j	6	10	10	

9. The following table gives the construction project and duration (in days)

Activity	1-2	1-3	2-3	2-4	3-4	4-5
Duration	15	20	5	8	7	12

Draw the network for the project.

10. Find out the Variance from the given data under

Job	Optimistic time	Most likely time	Pessimistic time
1-2	3	6	15
7-8	4	19	28
2-3	6	12	30
3-5	5	11	17
5-8	1	4	7

11. A coin is tossed twice. Find the probability of getting at least one head.
12. Solve the following assignment problem

		Machines		
		I	II	III
	A	2	6	5
Workers	B	9	2	8
	C	4	9	6

Section B $(5 \times 5 = 25)$ Marks

Answer any **FIVE** questions

13. Explain the different types of sampling.
14. A perfect die is tossed twice. Find the probability of getting a total of 9.
15. From the following data test if the difference between the variance is significant at 5% level of significance.

Sum of squares of deviations from the mean	84.4	102.6
Size	8	10
Sample	A	B

16. Find the optimal solution for the assignment problem with the following cost matrix

	W	X	Y	Z
A	11	17	8	16
B	9	7	12	6
C	13	16	15	12
D	14	10	12	11

17. The following tables gives the activities of a construction project and duration (in days)

Activity:	1-2	1-3	2-3	2-4	3-4	4-5
Duration;	20	25	10	12	6	10

a) Draw the network for the project

b) Find the critical path and the project duration

18. Three coins are tossed. Find the probability of getting (i) atleast one head (ii) exactly 2 heads.
19. A company keeps records of accidents. During a recent safety review, a random sample of 60 accidents was selected and classified by the day of the week on which they occurred.

Day :	Mon	Tue	Wed	Thu	Fri
No. of accidents :	8	12	9	14	17

Section C $(2 \times 15 = 30)$ Marks

Answer any **TWO** questions

20. A bag contains 4 white and 6 black balls. Two balls are drawn at random. What is the probability that (a) both are white, (b) both are black, (c) one white and one black.

21. Two samples of 6 and 5 items respectively gave the following data:

    Mean of the first sample = 40

    SD of the first sample = 8

    Mean of the second sample = 50

    SD of the second sample = 10

    Is the difference between the means significant? The value of t for 9df t 5% level is 2.26.

22. Solve the following transportation problem under Vogal's approximation method.

	A	B	C	a_i
F1	10	9	8	8
F2	10	7	10	7
F3	11	9	7	9
F4	12	14	10	4
b_j	10	10	8	

23. A project has the following characteristics.

Activity	Duration (Weeks)	Predecessors
A	6	None
B	8	A
C	4	A
D	9	B
E	2	C
F	7	D

    Construct the Network Diagram, Critical Path and Project duration.