B.Com DEGREE EXAMINATION,NOVEMBER 2019
I Year II Semester
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 Probability?
2. Two coins are tossed simultaneously. What is the probability of getting a head and a tail?
3. A bag contains 8 white and 3 red balls. If two balls are drawn at random, find the probability that both are white.
4. Define Sample.
5. Solve the following transportation problem.

	A	B	C	a_1
F_1	10	9	8	8
F_2	10	7	10	7
F_3	11	9	7	9
F_4	12	14	10	4
b_3	10	10	8	

6. Find the optimal solution for the assignment problem with the following Cost matrix.

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

7. What is Chi-square test?
8. What is meant by assignment method?
9. The following data are the characteristics of the project.

Activity	Immediate Predecessors	Duration for Days
A	-	2
B	A	3
C	A	4
D	B,C	6
E	-	2
F	E	8

10. Brief about the steps involved in North West corner rule method.
11. A sample of 900 items has mean 3.4 and Standard deviation 2.61. Can the sample be regarded as drawn from a population with mean 3.25 at 5% level of significance.
12. Expand PERT.

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

Answer any **FIVE** questions

13. Two students X and Y work independently on a problem. The probability that X will solve it is 3/4 and the probability that Y will solve it is 2/3. What is the probability that the problem will be solved?
14. A university has to select an examiner from a list of 50 persons, 20 of them women and 30 men, 10 of them knowing Hindi and 40 not. 15 of them being teachers and the remaining 35 not. What is the probability of the University selecting a Hindi-knowing woman teacher?
15. Explain the different sampling methods.
16. The height of 10 males of a given locality are found to be 175,168,155,170,152,170,175,160 based on these 10 samples. Test the hypothesis that mean height of male is 170 cms. Apply T-test. (Table value of 9 = 1.833)
17. Solve the following assignment problem.

		Operator				
		1	2	3	4	5
Job	1	10	12	15	12	8
	2	7	16	14	14	11
	3	13	14	7	9	9
	4	12	10	11	14	10
	5	8	13	15	11	15

18. Obtain an initial basic feasible solution to the following transportation problem by North West Corner rule method.

		Warehouse			
		W1	W2	W3	Supply
	P1	7	6	9	20
Plant	P2	5	7	3	28
	P3	4	5	8	17
	Demand	21	25	19	65

19. What is the process of PERT and CPM?

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

Answer any **TWO** questions

20. A factory has two machines A and B. Past record shows that machine A produced 60% of the items of output and machine B produced 40% of the items. Further, 2% of the items produced by machine A and 1% produced by machine B were defective. All the items are put into one stockpile and then one item is chosen at random from this and is found to be defective. What is the probability that it was produced by machine B?

21. A certain drug was administered to 456 males, out of a total 720, in a certain locality to test its efficacy against typhoid. The incidence of typhoid is shown below. Find out the effectiveness of the drug against the disease. (the table value of χ^2 for 1 d.f. at 5% level of significance is 3.84)

	Infection	No infection	Total
Administering the drug	144	312	456
Without administering the drug	192	72	264
Total	336	384	720

22. Find out the transportation cost by using least cost method.

	W1	W2	W3	supply
S1	7	6	9	20
S2	5	7	3	28
S3	4	5	8	17
Demand	21	25	19	65

23. A project schedule has the following characteristics. Calculate the expected duration of each activity and draw the network. Also find the critical path and the total duration of the projection.

Activity	Most likely	Optimistic	Pessimistic
	Time	time	Time
1-2	2	1	3
2-3	2	1	3
2-4	3	1	5
3-5	4	3	5
4-5	3	2	4
4-6	5	3	7
5-7	5	4	6
6-7	7	6	8
7-8	4	2	6
7-9	6	4	8
8-10	2	1	3
9-10	5	3	7