B.Com DEGREE EXAMINATION,APRIL 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 do you mean by Mutually Exclusive Event?
2. Explain the term Cluster sampling.
3. State any two uses of Transportation problem.
4. What do you mean by optimal solution?
5. What is balanced assignment problem?
6. One card is drawn from a standard pack of 52. What is the probability that it is either a king or queen?
7. What is the probability that a leap year, selected at random, will contain 53 Sundays?
8. The mean and standard deviation of marks in an examination are 74 and 12 respectively. Find the scores in standards (Z) units of students receiving grade is 65.
9. Give any two properties of Normal Distribution.
10. State the methods of Network Analysis.
11. What do you mean by sampling error?
12. What is one tail test?

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

Answer any **FIVE** questions

13. A bag contains 8 white and 4 red balls. Five balls are drawn at random. What is the probability that 2 of them are red and 3 white?
14. A certain drug was administered to 500 people out of a total of 800 included in the sample to test its efficiency against typhoid. The results are given below.

	Typhoid	Not Typhoid	Total
Drug	200	300	500
No Drug	280	20	300
Total	480	320	800

On the basis of this data, can it be concluded that the drug is effective in preventing typhoid. (for v=1, χ 2 $_{0.05}$ = 3.84)

15. A soap manufacturing company was distributing a particular brand of soap through a large number of retail shops. Before a heavy advertisement campaign, the mean sales per week per shop was 140 dozens. Another campaign a sample of 26 shops was taken and the mean sales were found to be 147 dozens with a standard deviation of 16 dozens. Can you consider the advertisement effective? (table value of t = 1.708)

16. Intelligence test on 2 groups of boys and girls gave the following results.

Sex	Mean	Standard deviation	n
Girls	75	15	150
Boys	70	20	250

Is there any significant difference in the mean score obtained by the boys and girls? (Z= 2.58)

17. Four jobs can be processed on four different machines, one job on one machine. Resulting times in minutes vary with assignments. They are given below.

		Machines			
		A	B	C	D
Jobs	I	42	35	28	21
	II	30	25	20	15
	III	30	25	20	15
	IV	24	20	16	12

Find the optimum assignment of jobs to machines and the corresponding profit.

18. The following table gives the activities in a construction project and other relevant information.

Activity	1-2	1-3	2-3	2-4	3-4	4-5
Duration(days)	20	25	10	12	6	10

(i.) Draw the network for the project

(ii.) Find the critical path and the project duration.

19. Solve the following transportation problem.

	A	B	C	a_i
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_j	10	10	8	

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

Answer any **TWO** questions

20. Briefly explain the types of sampling.

21. Apply χ 2 test to find out if the following figures provide evidence of the effectiveness of inoculations.

	Attacked	Not-Attacked	Total
Inoculated	20	300	320
Not inoculated	80	600	680
Total	100	900	1000

$(\chi 2 = 3.84)$

22. Consider a problem of assigning four clerks to four tasks. The times (hours) required to complete the tasks are given below.

	Task			
Clerks	A	B	C	D
1	4	7	5	6
2	-	8	7	4
3	3	-	5	3
4	6	6	4	2

Clerk 2 cannot be assigned to task A and clerk 3 cannot be assigned to task B. Find all the optimum assignment schedules.

23. A company has four factories from which it ships its product units to four warehouses W_1,W_2,W_3 and W_4 which are the distribution centres. Transportation costs per unit between various combination of factories (F_1,F_2,F_3& F_4) an warehouses are

	W_1	W_2	W_3	W_4	Availabilities
F_1	48	60	56	58	140
F_2	45	55	53	60	260
F_3	50	65	60	62	360
F_4	52	64	55	61	220
Requirements	200	320	250	210	