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 is meant by conditional probability?
2. Calculate the probability to draw a king or a queen from a standard pack of card.
3. In two tosses of a fair coin, what are the chances of getting head in both?
4. Write down the Laws of Sampling.
5. Student's 't' Distribution was discovered by_____(Fisher / Gosset)
6. A 1% significance level provides greater confidence to the decision that a 5% significance level. (True / False)
7. The number of degrees of freedom in a 5 x 5 contingency table is_____ (32 / 16)
8. Why dummy rows are added?
9. Obtain an initial basic feasible solution to the following transportation problem by North West Corner Method.

				Capacity
	12	11	7	60
	7	12	13	70
	15	7	80	80
Demand	50	80	80	

10. Expand the term PERT and CPM.
11. The activities of a project paths and duration are given below determine the critical path.

S.No	Paths	Duration(days)
1.	1-2-3-5-8	18
2.	1-2-4-5-8	11
3.	1-6-7-8	17

12. There are three types of time estimates are given below determine the expected time estimate.

(a) The Optimistic time estimate (To) = 6

(b) The Pessimistic time estimate (Tp) = 30

(c) The most likely time estimate (Tm) = 12

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

Answer any **FIVE** questions

13. A bag contains 5 white and 3 black balls. Two balls are drawn at random one after the other without replacement. Find the probability that both balls drawn are black.

14. Describe the types of sampling methods.

15. A manufacturer of electric bulbs claims that his bulbs have a mean life of 25 months with a standard deviation of 5 months. A sample of six bulbs has a mean life of 23 months with a standard deviation of 4.517. Can you regard the producers claim to be valid at 1% level of significance.

16. In a sample of 8 observations, the sum of squared deviations of items from the mean was 84.4. In another sample of 10 observations, the value was found to be 102.6. Test whether the difference is significant at5% level. You are given that at 5% level, critical value of F for $v^1 = 7$ and $v^2 = 9$ degrees of freedom is 3.29 and for $v^1 = 8$ and $v^2 = 10$ degrees of freedom, its value is 3.07.

17. Solve the following assignment problem:

	G	H	I	J	K
I	16	11	15	24	17
II	19	25	12	18	20
III	9	8	10	10	11
IV	24	15	18	23	21
V	17	11	20	25	16

18. Obtain an initial basic feasible solution to the following transportation problem by VAM.

					Capacity
	1	2	1	4	30
	3	3	2	1	50
	4	2	5	9	20
Demand	20	40	30	10	

19. The following table 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

Draw the network diagram and find the critical path.

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

Answer any **TWO** questions

20. A problem is statistics is given to five students A, B, C, D and E. Their chances of solving it are $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, and $\frac{1}{6}$. What is the probability that the problem will be solved?

21. In an anti-malarial campaign in a certain area, quinine was administered to 812 persons out of a total population of 3248. The number of fever cases is shown below:

Treatment	Fewer	No Fewer	Total
Quinine	20	792	812
No- quinine	220	2216	2436
Total	240	3008	3248

Discuss the usefulness of quinine in checking malaria.

22. Five different machines can do any of the five required jobs, with different profits resulting from each assignment as shown below:

	Machines				
Job	A	B	C	D	E
1	30	37	40	28	40
2	40	24	27	21	36
3	40	32	33	30	35
4	25	38	40	36	36
5	29	62	41	34	39

Find out maximum profit possible through optimal assignment.

23. The following table gives data on estimates optimistic, most likely and pessimistic duration in weeks for a project.

	(Estimated duration in weeks)		
Activity	Optimistic	most likely	Pessimistic
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-5	2	5	8
5-6	3	6	15

i.) Draw the project network and identify all the paths through it.

ii.) Find the expected duration and variance for each activity.