Roll.No. | **24UCOAT2002**

SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.
B.Com. - END SEMESTER EXAMINATIONS - NOVEMBER 2025
SEMESTER - II
24UCOAT2002 - Business Statistics and Operations Research-II

Total Duration : 2 Hrs.30 Mins. Total Marks : 60

Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. A card is drawn from a well-shuffled deck of 52 cards, and then without replacement, another card is drawn. Find the probability that:
   a) Both cards are aces.
   b) First card is a king and the second is a queen.
2. Difference between Probability and Non – Probability sampling.
3. Define Parametric Test & Non-Parametric Test.
4. The manufacturer of a certain make of electric bulbs claims that his bulbs have a mean life of 25 months with a standard deviation of 5 months. A random sample of 6 such bulbs gave the following values.
   Life of months, 24, 26, 30, 20, 20, 18.
   Can you regard the producer's claim to be valid at 1% level of significance? (Given that the table values of the appropriate test statistics at the said level are 4.032, 3.707 and 3.499 for 5, 6 and 7 degrees of freedom respectively)
5. A project work consists of four major jobs for which four major contractors have submitted tenders. The tender documents quoted in thousands of rupees are given with the matrix as

		Jobs			
		$\mathbf{J}_1$	$\mathbf{J}_2$	$\mathbf{J}_3$	$\mathbf{J}_4$
Contractors	$\mathbf{C}_1$	15	27	35	20
	$\mathbf{C}_2$	21	29	33	17
	$\mathbf{C}_3$	17	25	37	15
	$\mathbf{C}_4$	14	31	39	21

   Find the assignment which minimises the total of the project cost. Each contractor has to be assigned one job.

Contd...

6. Find an initial basic feasible solution of the following problem using North West Corner rule.

		Distribution Centers				Supply
		D_1	D_2	D_3	D_4	
Origin	O_1	5	3	6	2	**19**
	O_1	4	7	9	1	**37**
	O_1	3	4	7	5	**34**
Demand		**16**	**18**	**31**	**25**	

7. Construct PERT network for the following project and determine the critical path and project duration.

Activity	Duration in days	Immediate Predecessors
A	4	None
B	1	None
C	1	A
D	1	B
E	6	C
F	8	E
G	2	F
H	4	F
I	1	G
J	5	H, I
K	5	D, G
L	2	K

8. The following data are the characteristics of a project.

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

Draw the network diagram for the above project and find the minimum project completion time and the critical path.

Section C

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. Two dice are rolled together. Find the probability of getting a doublet or sum of faces as 4.

Contd...

10. Explain the different types of samplings.

11. A die was rolled 60 times and the observed frequencies for faces 1–6 were: 4, 8, 9, 10, 15, 14. Test at = 0.05 whether the die is fair (use chi-square goodness of fit). Give the chi-square statistic, degrees of freedom, critical value, and conclusion.

12. Find the initial basic feasible solution for the following transportation problem by Vogel's Approximation Method (VAM).

		Distribution Centers				**Availability**
		D_1	**D_2**	**D_3**	**D_4**	
Origin	**O_1**	2	3	11	7	**6**
	O_2	1	0	6	1	**1**
	O_3	5	8	15	9	**10**
Requirement		**7**	**5**	**3**	**2**	

13. Develop a network diagram for the project specified below:

Activity	A	B	C, D	E	F	G
Immediate Predecessor Activity	-	A	B	C	D	E, F

*****