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 - APRIL 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 bag contains 2 white and 3 black balls. Four persons A, B, C and D in the order named each draw one ball and do not replace it. The person to draw a white ball receives Rs.2,000. Determine their expectation.

2. A wholesaler in apples claims that only 4% of the apples supplied by him are defective. A random sample of 600 apples contains 36 defective apples. Test the claim of the wholesaler.

3. Obtain an initial basic feasible solution, using the north-west corner rule for the following transportation problem:

	D1	**D2**	**D3**	**D4**	**Availability**
S1	6	8	8	5	30
S2	5	11	9	7	40
S3	8	9	7	13	50
Demand	35	28	32	25	120

4. Find the critical path of a project having the tasks as given

Job	**Time**	**Job**	**Time**
(1,2)	2	(5,8)	5
(2,3)	7	(6,7)	8
(2,4)	3	(6,10)	4
(3,4)	3	(7,9)	4
(3,5)	5	(8,9)	1
(4,6)	3	(9,10)	7

5. Explain the sampling procedures.

6. The lifetime of electric bulbs for a random sample of 10 from a large consignment gave the following data:

Item	1	2	3	4	5	6	7	8	9	10
Life in '000 hours	4.2	4.6	3.9	4.1	5.2	3.8	3.9	4.3	4.4	5.6

Can we accept the hypothesis that the average life time of bulb is 4,000 hours.

Contd...

7. Solve the following assignment problems.

	Jobs				
Workers		J1	J2	J3	J4
	W1	10	15	24	30
	W2	16	20	28	10
	W3	12	18	30	16
	W4	9	24	32	18

8. Draw a network diagram for the following set of activities:
A<B,C ;B<D,E; C<E; E<F; D, F<G; G<H

Section C

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

9. A bag contains 10 white and 6 black balls, 4 balls are successively drawn out and not replaced. What is the probability that they are alternately of different colours?

10. Classify the various methods of sampling.

11. 1,000 students at college level were graded accordingly to their I.Q and the economic conditions of their homes. Use chi-square test to find out whether there is any association between economic condition at home and I.Q.

	I.Q		
Economic condition	**High**	**Low**	**Total**
Rich	460	140	600
Poor	240	160	400
Total	700	300	1,000

Given for v = 1, x^2 0.05 = 3.84.

12. The assignment costs of four operation to four machines are given in the following table.

	Operation				
Machines		I	II	III	IV
	A	10	5	13	15
	B	3	9	18	3
	C	10	7	3	2
	D	5	11	9	7

Find the optimal assignment using the Hungarian method.

13. A project consists of jobs A,B,C,D,E,F,G,H,I such that A<D; A<E; B<F; D<F; C<H; F<I; G<I The time taken for each job is given below:

Jobs	A	B	C	D	E	F	G	H	I
Time (days)	8	10	8	10	16	17	18	14	9

Draw the network diagram. Find the critical path and minimum time of completion of the project.

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