

Roll.No.

24PCOCT2006

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.

M.Com. - END SEMESTER EXAMINATIONS - NOVEMBER 2025
SEMESTER - II

24PCOCT2006 - Operations Research

Total Duration : 2 Hrs. 30 Mins.

Total Marks : 60

Section B

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

1. Describe Scope of Operations Research.
2. The processing time in hours for the jobs when allocated to the different Machines are indicated below. Assign the machines for the jobs so that the total processing time is minimum.

		Machines				
		M ₁	M ₂	M ₃	M ₄	M ₅
Jobs	J ₁	9	22	58	11	19
	J ₂	43	78	72	50	63
	J ₃	41	28	91	37	45
	J ₄	74	42	27	49	39
	J ₅	36	11	57	22	25

3. There are five jobs each of which is to be processed through two machines M₁, M₂ in the order M₁, M₂. Processing hours are as follows.

Job	A	B	C	D	E
M ₁	3	8	5	7	4
M ₂	4	10	6	5	8

Determine the optimum sequence for the five jobs, and minimum total elapsed time. Find also the ideal time of Machines M₁ and M₂.

4. A machine owner finds from his past records that the cost per year of maintaining a machine whose purchase price is Rs.6,000 are as Given below.

Year	1	2	3	4	5	6
Maintenance Cost (Rs.)	1,000	1,200	1,400	1,800	2,300	2,800
Value (Rs.)	3,000	1,500	750	375	200	200

Show at what age is replacement due?

Contd...

5. In a railway Marshalling yard, goods train arrive at a rate of 30 Trains per day. Assuming that inter arrival time follows an exponential distribution and the service time distribution is also exponential, with an average of 36 minutes. Calculate the following
- 1) The mean queue size (line length)
 - 2) The probability that queue size exceeds 10
 - 3) If the input of the Train increases to an average 33 per day, what will be the changes in (1), (2).
6. Solve the following 2 X 2 Game.

Player A	
Player B	$\begin{bmatrix} 5 & 1 \\ 3 & 4 \end{bmatrix}$

it must minimise bias and maximise reliability.” – Predict this statement.

7. Find the initial basic feasible solution for the following Transportation problem by applying Minimum Cost Method.

		To				Supply
		1	2	3	4	
From	1	1	2	3	4	30
	2	3	3	2	1	50
	3	4	2	5	9	20
Demand		20	40	30	10	

8. Examine the advantages and disadvantages of LPP.

Section C

I - Answer any **TWO** questions (2 × 10 = 20 Marks)

9. An automobile manufacturer makes automobiles and trucks in a factory that is divided in to two shops. Shop A, which performs the basic assembly operation most work 5 man-days on each truck but only 2 man-days on each automobile. Shop B, which performs finishing operations most work 3 man- days for each truck of automobile that it produces. Because of men and machine limitations shop A has 180 man - days per week available while Shop B has 135 man-days per week. If the manufacturer makes a profit of Rs. 300 on each truck and Rs. 200 on each automobile, how many of each should be produce to maximize his profits? (Apply Simplex method)
10. Solve the Transportation problem.

		Destination				Supply
		40	25	22	33	
Sources	1	40	25	22	33	100
	2	44	35	30	30	30
	3	38	38	28	30	70
Demand		40	20	60	30	

Contd...

11. Calculate critical path and also find the all float, for the project whose activities are given below.

Activity	1-2	1-3	1-5	2-3	2-4	3-4	3-5	3-6	4-6	5-6
Duration (in weeks)	8	7	12	4	10	3	5	10	7	4

The data is the same.

12. Describe the single channel queuing model.

II - Compulsory question (1 × 10 = 10 Marks)

13. Solve the sequence that minimises the total elapsed time required to complete the following task on Machines M1 and M2 in the order M1, M2. Also find the minimum total elapsed time.

Tasks	A	B	C	D	E	F	G	H	I
M ₁	2	5	4	9	6	8	7	5	4
M ₂	6	8	7	4	3	9	3	8	11
