

19P250

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Name.....

Reg. No.....

SECOND SEMESTER M.Com. DEGREE EXAMINATION, APRIL 2020

(CUCSS - PG)

CC19P MCM2 C10 - MANAGEMENT SCIENCE

(Commerce)

(2019 Admissions: Regular)

Time: Three Hours

Maximum: 30 Weightage

Section A

Answer any *four* questions. Each question carries 2 weightage.

1. What is Markov Analysis? Explain the assumptions of Markov analysis.
2. Define Saddle Point with an example.
3. What is Independent Float?
4. What are activity variance and project variance?
5. Explain the elements of set up cost.
6. Explain the term arrival pattern in Queuing Theory.
7. Explain the basic assumptions of transportation technique.

(4 x 2 = 8 Weightage)

Section B

Answer any *four* questions. Each question carries 3 weightage.

8. Model building is the essence of management science approach. Explain.
9. Explain Forward Pass and Backward Pass Method in Network analysis with an example.
10. Explain the Maximin and Minimax Principle used in game theory.
11. Obtain an initial basic feasible solution to the following transportation problem using the Least Cost method

	D ₁	D ₂	D ₃	D ₄	Available
O ₁	1	2	3	4	6
O ₂	4	3	2	0	8
O ₃	0	2	2	1	10
Requirement	4	6	8	6	

12. Five jobs are to be processed and five machines are available. Any machine can process any job with resulting profit (in Rs) as follows:

		Machines				
		A	B	C	D	E
Jobs	1	32	38	40	28	40
	2	40	24	28	21	36
	3	41	27	33	30	37
	4	22	38	41	36	36
	5	29	33	40	35	39

Find the assignment pattern that maximizes sales.

13. A company has a demand of 12000 units per year for an item and it can produce 2000 such items per month. The cost of one setup is Rs.400 and the holding cost per unit per month is Rs.0.15. Find the optimum lot size, maximum inventory, manufacturing time and total time.

14. Customers arrive at a one window drive in bank according to Poisson distribution with mean 15 per hour. Service time per customer is exponential with mean 10 minutes. The space in front of the windows, including that for the serviced car can accommodate a maximum of four cars. Other cars wait outside this space.

- What is the probability that arriving customer can drive directly to the space in front of the window?
- What is the probability that arriving customer will have to wait outside the indicated space?
- How long is an arriving customer expected to wait before starting service?

(4 x 3 = 12 Weightage)

Section C

Answer any *two* questions. Each question carries 5 weightage.

15. Explain how management science is implemented in managerial problems?

16. For the following game, find optimal strategies of A and B and Value of game using principle of dominance:

		Player B			
		B ₁	B ₂	B ₃	B ₄
Player A	A ₁	7	6	8	9
	A ₂	-4	-3	9	10
	A ₃	3	0	4	2
	A ₄	10	5	-2	0

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17. A small project is composed of 5 activities whose time estimates are listed below

Activities	Duration (days)		
	t _p	t _m	t _o
1-2	3	5	7
1-3	8	10	12
2-4	4	10	16
3-4	1	2	3
4-5	1	1	7

- Draw the project network
- Find the expected duration and variance of each activity. What is the expected project length?

18. The ABG Company combines factors P and Q to form a product which much weight 50 Kgs. At least 20 kg of P and no more than 40 Kg of Q can be used. P cost Rs. 25 and Q Rs.10 per Kg. Find the amount of Factor P and Q to be used manufacturing the product using Simplex method.

(2 x 5 = 10 Weightage)

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