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Reg. No...................................

SECOND SEMESTER M.A./M.Sc./M.Com. DEGREE EXAMINATION JUNE 2020

(CBCSS)

M.Com.

MCM 2C 10—MANAGEMENT SCIENCE

(2019 Admissions)

Time : Three Hours

Maximum : 30 Weightage

Part A

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

1. What do you mean by unbalanced transportation problem ?

2. What do you mean by slack variable ?

3. Define analog model.

4. Explain balking.

5. What do you mean by a critical activity in project management ?

6. What is mixed strategy ?

(4 × 2 = 8 weightage)

Part B

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

7. A home resourceful decorator manufactures two types of lamps A and B. Both lamps go through two technicians first a cutter and a finisher. Lamp A requires 2 hours of the cutter's time and 1 hour of the finisher's time : Lamp B requires 1 hour of cutter's time and 2 hours of finisher's time. The cutter has 200 hours and finisher has 90 hours of available time each month. Profit on the Lamp A is Rs. 60 and on one B lamp is 110. Formulate LPP model.

8. In a car workshop, the cars arrive at a rate of 30 car per day. Assuming that the inter arrival time follows an exponential distribution and the service time distribution is also exponential with an average 36 minutes. Calculate average length of queue and the probability the queue size exceeds 10

Turn over

9. A factory requires 1500 units of an item per month, each costing Rs 27. The cost per order is Rs. 150 and the inventory carrying charges worked out to 20% of the average inventory. Find out the EOQ and number of orders per year. Wound you accept a 2 % discount on a minimum supply quantity of 1200 units ?.

10. From the following pay off matrix for firm A, determine the optimal strategies for both the firms and the value of the game using maximin-minimax principle :

	Firm B				
	3	− 1	4	6	7
	− 1	8	2	4	12
Firm A	16	8	6	14	12
	1	11	− 4	2	1

11. List out the limitations of Management Science.

12. Explain the decision making process under Markov analysis

13. Solve the following assignment problem :

Task \ Employees	I	II	III	IV	V
A	1	3	2	3	6
B	2	4	3	1	5
C	5	6	3	4	6
D	3	1	4	2	2
E	1	5	6	5	4

14. XYZ company uses 12,000 units of component A in a year Component A is currently made in 30 batches of 400 units on a machine that makes 8 units per hour. The company operates for 2000 hours per year and it costs Rs. 60 to set up the machine, irrespective of batch size. For work in progress purposes, component A is valued at Rs. 10. Investigate whether the existing production plan is optimal and if not, to suggest a new plan showing what savings are possible.

(4 × 3 = 12 weightage)

Part C

Answer any two questions.
Each question carries 5 weightage.

15. What do you mean by assignment problem ? Explain the assignment algorithm.

16. A Small project consisting of eight activities has the following characteristics :

Activity	Preceding activity	Most optimistic time	Most likely time	Most pessimistic time
A	None	2	4	12
B	None	10	12	26
C	A	8	9	10
D	A	10	15	20
E	A	7	7.5	11
F	B, C	9	9	9
G	D	3	3.5	7
H	E, F, G	5	5	5

Draw the PERT network for the project, determine critical path and show the EST, EFT, LST and LFT.

17. Following data are available for a firm which manufactures three items A, B and C.:

Product	Time required (in hours)		Profit
	Assembly	Finishing	
A	10	2	800
B	4	5	600
C	5	4	300
Firm's capacity	2,000	1,009	

(i) Express the above data in the form of linear programming problem to maximize the profit from the production.

(ii) Solve it by simplex method.

Turn over

18. Solve the following transportation problem :

Factory \ Warehouse	W1	W2	W3	W4	W5	Available
F1	3	4	6	8	9	20
F2	2	10	1	5	8	30
F3	7	11	20	40	3	15
F4	2	1	9	14	16	13
Required	40	6	8	18	6	

(2 × 5 = 10 weightage)