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12MBA22

Second Semester MBA Degree Examination, June / July 2013
Quantitative Methods – II

Time: 3 hrs.

Max. Marks:100

Note: 1. Answer any THREE questions, from Q.No.1 to Q.No.6.
2. Q.No. 7 and 8 are compulsory.
3. Use of Graph sheets permitted.

- 1 a. Define a model. (03 Marks)
 b. Solve the following game model. Find optimal solution by graphical approach. (07 Marks)

		B strategy →			
		b1	b2	b3	b4
A ↑	a1	8	5	-7	9
	a2	-6	6	4	-2

- c. Solve the following LPP by Graphical method (10 Marks)
 Max $Z = 10x_1 + 15x_2$
 STC $2x_1 + x_2 \leq 26$
 $2x_1 + 4x_2 \leq 56$
 $x_1 - x_2 \geq -5$
 $x_1, x_2 \geq 0$

- 2 a. What is Burst event? (03 Marks)
 b. Solve the following network by critical path method. Identify total project duration and critical path. (07 Marks)

Act	1-2	1-3	2-6	3-4	3-5	4-6	5-6	5-7	6-7
D ⁿ	4	6	8	7	4	6	5	19	10

- c. A company produces 30 cars per day. The probability of daily sales quantity is given below

Sales units	27	28	29	30	31	32
Probability	0.1	0.15	0.20	0.35	0.15	0.05

Simulate for next 10 days using following Random No. and find how many days company loses opportunity of selling car? 5 95 18 63 35 84 7 54 28 14. (10 Marks)

- 3 a. Use minimum maximum criterion to solve the following problem of 40×60 site of Mr. Ganesh at 'A' class city. He has got 3 options i) constructing lodge ii) constructing a marriage hall iii) constructing marriage hall with Rooms, The market condition may be A) Favorable B) Moderate and C) Unfavorable. Which option is good? (05 Marks)

→ Outcome in '000 of Rupee/year

Option	Cond A	B	C
i	250	150	175
ii	300	200	250
iii	400	250	200

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

- b. Examine weather the following iteration solution is optimal? (05 Marks)

→ Warehouse

		W1	W2	W3	W4	Supply
Plant ↑	A	5	10	⑩ 4	5	10
	B	⑫ 6	8	7	⑤ 2	25
	C	⑤ 4	⑩ 2	⑤ 5	7	20
	Demand	25	10	15	5	

- c. Solve the following PERT network, find the critical path. What is the probability of project completing one week before? (10 Marks)

Activity	A	B	C	D	E	F	G	H	I
Logical precedence	-	-	-	A	A	B, D	B, D	C, F	E
t_o	2	6	6	2	11	8	3	9	4
t_m	4	6	12	5	14	10	6	15	10
t_p	6	6	24	8	23	12	9	27	16

[Note : From Normal table for area between μ and Z approximately - 0.31 is 0.1217]

- 4 a. State any three limitations and two scopes of OR. (05 Marks)
 b. List important steps followed in Monte Carlo simulation method. (05 Marks)
 c. Solve the following sequencing problem and find out total elapsed time. (10 Marks)

Jobs	MACHINE			
	A	B	C	D
1	8	3	4	7
2	9	2	5	5
3	6	4	5	8
4	12	5	1	9
5	7	1	2	3

- 5 a. Define Zero Sum Game. (03 Marks)
 b. Find optimal assignment for following case table show processing time in minutes. (07 Marks)

Operator	MACHINE			
	A	B	C	D
X	60	0	75	0
Y	90	0	200	150
Z	56	20	50	0
P	60	0	75	120

- c. The Taj service station has a central stores where service mechanics arrive to take spare parts for the jobs they work upon. Mechanics wait in queue, if necessary and are served on a FCFS basis. The store is managed by one attendant who can attend 8 mechanics in an hour on an average. The arrival rate of mechanics averages 6 per hour. Assuming Poisson distribution for arrivals and exponential for service. Calculate W_s , W_q and L_q . (10 Marks)
- 6 a. The Research Institute suggested to a farmer to spread out at least 4800kg of a special phosphate fertilizer and not less than 7200kg of special Nitrogen fertilizer to raise a productivity of crops in his fields. There are two sources of obtaining these – mixtures A and B. Both are available in bags weighing 100kgs each and they cost Rs 40/- and Rs 24/- respectively.
 Mixture A contains phosphate and nitrogen equivalent of 20kg and 80kg respectively. While mixture B contains these ingredients equivalent of 50kg each. Formulate a suitable OR model. (10 Marks)
- b. Discuss various models of OR in brief. (10 Marks)

Compulsory :

- 7
- a. Mr. Kiran formulated a business problem and used L.P.P solution methods both graphical and simplex. He failed to get solution as it is. Suggest how this situation can be solved by LPP only. (05 Marks)
 - b. Nepal Government is planning to build Metro system in it's city. Now, if your are strategic manager which technique you use to manage this project and why? (05 Marks)
 - c. Mr. Juran is planning to start a medium size bakery at one of the city corner. Now he is worried about the demand and supply of the bakery items. If you are asked to advise how will you advise him by taking OR technique into account? Why? (05 Marks)
 - d. Vinay is an MBA graduate student completing his course in another one year. He has got confusion and uncertainty related to his next course of action after MBA. He has got future scope in continuing higher education, joining a corporate and starting his own business. How can he take decision in this junction? (05 Marks)
- 8 Write short notes on : **(Compulsory)**
- a. Crashing in Network analysis. (05 Marks)
 - b. Decision under Risk and uncertainty. (05 Marks)
 - c. Limitations of Graphical solution to L.P.P. (05 Marks)
 - d. Structure of Queuing system. (05 Marks)
