

Total No. of Questions : 5]

SEAT No. :

P-7899

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[6118]-3002

M.B.A.

302-GC-12 : DECISION SCIENCE

(Revised 2019 Pattern) (Semester - III)

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) All questions are compulsory.
- 2) Each question carries 10 marks.
- 3) Each question has an internal option.
- 4) Use of simple calculator is allowed.

Q1) Solve any five questions :

[10]

- a) What is Pure Strategy Game?
- b) Explain CPM and PERT.
- c) What is Flood's Technique! Hungarian Method?
- d) Explain Principal of Dominance
- e) Explain Modified Distribution Method
- f) What is Hurwicz Alpha Criterion?
- g) What is Single Server Queuing Model?

Q2) Solve any two out of the three questions :

[10]

- a) Elaborate with suitable example any five applications of Markov-chain in Management field.
- b) Describe Network crashing and various components of project cost.
- c) Describe Importance of Decision Science in Organisational Decision Making Process.

P.T.O.

Q3) Solve Any One :

[10]

a) Solve the following LPP graphically :

$$\text{Maximise } Z = 120x + 100y$$

$$\text{Subject to; } 10x + 5y \leq 80$$

$$6x + 6y \leq 66$$

$$4x + 8y \geq 24$$

$$5x + 6y \leq 90$$

$$x \geq 0, y \geq 0$$

b) A company manufactures around 150 mopeds. The daily production varies from 146 - 154 depending upon the availability of raw materials and other working conditions.

Production Per Day	146	147	148	149	150	151	152	153	154
Probability	0.04	0.09	0.12	0.14	0.11	0.10	0.20	0.12	0.08

The finished mopeds are transported in a specially arranged lorry accommodating only 150 mopeds. Using following random numbers : 80, 81, 76, 75, 64, 43, 18, 26, 10, 12, 65, 68, 69, 61, 57. Simulate the process to find out :

- What will be the average number of mopeds waiting in the factory?
- What will be the average Number of empty spaces on the lorry?

Q4) Solve Any One :

[10]

a) A self-service store employs one cashier at its counter. Nine customers arrive on an average every 5 minutes while the cashier can serve 10 customers in 5 minutes. Assuming poisson distribution for arrival rate and exponential distribution for service rate find :

- Average number of customers in the system.
- Average number of customers in the queue or average queue length
- Average time a customer spends in the system
- Average time a customer waits before being served.

b) The following information is gathered for a project :

Activity	Preceding Activity	Duration (Week)
A	-	1
B	A	3
C	A	4
D	A	3
E	D	2
F	B,C,E	4
G	D	9
H	D	5
I	H	2
J	F,G,I	2

- i) Draw the network diagram.
- ii) Determine critical path and project Duration.
- iii) What is the Effect on the project duration if :
 - 1) D is changed to 6 weeks.
 - 2) F is changed to 8 weeks.

Q5) Solve Any One :

[10]

a) Two breakfast food manufacturing firms A and B are competing for an increased market share. To improve its market share both the firms decide to launch the following strategies.

A_1B_1 = Give coupons

A_2B_2 = Decrease price

A_3B_3 = Maintain Present strategy

A_4B_4 = Increase Advertising

The pay-off matrix shown in the following table describes the increase in the market share for firm A and decrease in the market share for firm B.

	Firm B			
Firm A	B ₁	B ₂	B ₃	B ₄
A ₁	35	65	25	5
A ₂	30	20	15	0
A ₃	40	50	0	10
A ₄	55	60	10	15

Determine the optimal strategies for each firm and the value of the Game.

- b) Four cards are drawn at random from a pack of 52 cards, Find the probability that :
- They are a king, a queen, a jack and an ace
 - Two are kings and two are jacks.
 - All are clubs
 - All are red or all are blacks

