2018

COMMERCE

MCO 203

QUANTITATIVE TECHNIQUE FOR BUSINESS DECISION

Full Marks: 80

Time: 3 Hours

The figures in the margin indicates full marks for the questions

Q.1. Answer the following questions: 1x12=12

i) EOQ stands for?

ii) Define Linear Programme.

iii) What is sensitivity Analysis?

iv) What is Transportation Table?

v) State whether True or False: Origin is a point of supply in a transportation problem.

vi) A special type of linear programming problem concerned with finding an optimum transportation scheme between origin and destination is

a) Transportation Problem   b) Linear Programme

c) Simplex method   d) Sensitivity Analysis

vii) Name the mathematician who developed assignment method of solving assignment problems.

viii) In an assignment problem, if a specific cell is not allocated because of some reasons, it is called as-

a. balanced assignment problem

b. unbalanced assignment problem

P.T.O

c. prohibited assignment problem

d. partial assignment problem

ix) The value of dummy row or column will always be-

    a) 0   b) 1

    c) -1   d) 2

x) Who of the following mathematician developed the queuing theory ?

    a) D.Koniy   b) A.K.Erlang

    c) K. John   d) N.K. Masio

xi) The service rate at which customers are being served is denoted by -

    a) Lamda   b) Mue

    c) Pie   d) Ratio

xii) A customer who waits in the queue for some time and then quit the queue is called

    a. Balking   b. Jockeying

    c. Reneging   d. Quitter

Q.2. Answer the following questions: 5x4=20

a) Write advantages & disadvantages of L.P.P.

b) Write a note on North-West Corner Method.

c) What is assignment problem? Mention any four importance of studying assignment problem.

d) Write the definition of the following terms in relation to the queuing theory :

i) Balking   ii) Jockeying

iii) Reneging   iv) Priorities   v) Queuing system

Q.3. Answer the following questions (any four):   12 x 4=24

a) Solve the following LPP using Graphical Method

    Maximize: $Z=100x1 + 60x2$

    subject to $5x_1 + 10x_2 \leq 50$

$$8x_1 + 2x_2 \geq 16$$
$$3x_1 + 2x_2 \geq 6$$
$$x_1 \text{ and } x_2 \geq 0$$

b) A company manufacturing air coolers has two plants located at Guwahati & Kokrajhar with a weekly capacity of 200 units and 100 units respectively. The company supplies air coolers to its 4 showrooms situated at Bongaigaon, Nalbari, Tezpur & Jorhat which have a demand of 75, 100, 100 & 30 units respectively. The cost of per unit in ? is shown in the following table:

Plant	Bongaigaon	Nalbari	Tezpur	Jorhat
Guwahati	90	90	100	100
Kokrajhar	50	70	130	85

Plan the production programme so as to minimize the total cost of transportation.

c) Define Network analysis and explain in details PERT and CPM

d) Solve the following assignment problems: 6 + 6 = 12

i) The captain of a cricket team has to allot four middle batting positions to four batsmen. The average runs scored by each batsman at these positions are as follows:

Batsmen	Batting Positions			
	I	II	II	IV
Gambhir	40	40	35	50
Raina	42	30	16	27
Kohli	50	48	40	50
Jadeja	58	60	59	53

Find the assignment of batsmen to positions, which would give the maximum number of runs to the team.

ii) A company has 4 machines to do 3 jobs. Each job can be assigned one and only one machine. The cost of each job on each machine is given in the following table:

Jobs	Machine			
	W	X	Y	Z
A	18	24	28	32
B	8	13	17	18
C	10	15	19	22

You are required to assign the jobs in such a way that the cost will be minimized.

e). Solve the following questions: $6 + 6 = 12$

i) A T.V.set repairman found that the time spent by him follows an exponential distribution with mean 30 minutes. If he repairs sets in order in which they come and the arrival of sets in approximately Poisson distribution with an average rate of 10 per 8 hours day, then calculate various constant relating to queuing theory.

ii) At a certain Petrol pump, customer arrived in a Poisson process with an average time of 5 minutes between arrivals. If the mean time taken to serve a service unit is two minutes, then answer the following:

a) What would be the expected customer in the queue length?

b) What would be average length of non-empty queue?

c) What would be the average waiting time of a customer who has to wait?

d) What would be the average waiting time of a customer in the queue?

e) By how much should the flow of customer be increased to justify the opening of a second service point if the management is willing to open the same provided the customer has to wait 5 minutes for the service?

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