C–2355

Sub. Code
31016

M.B.A. DEGREE EXAMINATION, NOVEMBER-2020

First Semester

Industry Integrated

QUANTITATIVE TECHNIQUES

(2017 onwards)

Duration : 3 Hours   Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1.   Define linear programming.

2.   Define Inventory

3.   What are the advantages and disadvantages of having inventories?

4.   Define float.

5.   What do you mean by slack?

6.   What is simulation?

7.   What are the applications of simulation technique?

8.   Define PERT Network.

9.   What is transportation problem?

10.   What is degeneracy in transportation problem?

Part B (5 × 5 = 25)

Answer **all** questions.

11. (a) What are the essential characteristics of a linear programming model?

Or

(b) Old hens can be bought for Rs.2 each but young ones Rs.5 each. The old hens lay 3 eggs per week and young ones 5 eggs per week, each egg being worth 30 paise. A hen costs Re.1 per week to feed. If a person has only Rs.80 to spend on the hens, how many of each kind should he buy to get a profit of more than Rs.6 per week assuming that he cannot house more than 20 hens?

12. (a) Explain simplex method of solving linear programming problem.

Or

(b) Explain with example an L.P. Problem having unbounded solution. Use graphical method to explain.

13. (a) Explain the following terms in inventory management
(i) Carrying cost
(ii) Storage costs

Or

(b) Represent in the form of a table the various types of inventory control models.

14. (a) Depict the following dependency relationships by means of network diagrams. The alphabets stand for activities.

(i) A and B Control F; B and C control G

(ii) A and B Control F; B Controls G while C controls G and H.

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(iii) A controls F and G; B controls G while C controls G and H.

(iv) F and G are controlled by A; G and H are controlled by B with H controlled by B and C.

(v) A controls F, G and H; B Controls G and H with H controlled by C.

Or

(b) Explain forward and backward planning.

15. (a) Customers arrive at a service facility to get the required service. The interarrival and service times are constant and are 1.8 minutes and 4 minutes respectively. Simulate the system for 14 minutes. Determine the average waiting time of a customer and idle time of the service facility.

Or

(b) Three points are chosen at random on the circumference of a circle. Find by Monte Carlo methods the probability that they lie on the same semi-circle.

Part C $(3 \times 10 = 30)$

Answer **all** questions.

16. (a) Explain the following in the context of transportation problem.

(i) Stepping stone method

(ii) Degenerate Transportation problem

(iii) Modified distribution method.

Or

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(b) Explain briefly the following:

   (i)   MODI method

   (ii) Loops in transportation problem

17. (a) Explain crashing of project Network.

Or

(b) Calculate Karl Pearson's coefficient of correlation using actual Mean and assume mean

   X: 25   10   20   32   50   28   26   14   12   13

   Y: 15   12   19   26   23   22   13   10   15   15

18. (a) Explain how do you apply Monte Carlo stimulation technique for

   (i)   Queuing problems

   (ii) PERT Network Illustrate with eg.

Or

(b) The demand for a particular item has the probability distribution shown below:

Daily demand (units) :	4	5	6	7	8	9	10	11	12
Probability	0.06	0.14	0.18	0.17	0.16	0.12	0.08	0.06	0.03

If the lead time is 5 days, using simulation study the implications of inventory policy of ordering 50 units whenever the inventory at the end of the day is 40 units. Assume the initial stock level of 75 units and run the simulation for 25 days.

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