



QP CODE: 25047391



Reg No :

Name :

M.Sc DEGREE (CSS) EXAMINATION, NOVEMBER 2025

Third Semester

M Sc OPERATIONS RESEARCH AND COMPUTER APPLICATIONS

Core Course - CE020302 - INVENTORY THEORY AND DYNAMIC PROGRAMMING

2019 ADMISSION ONWARDS

73122F6E

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

Weight 1 each.

1. Give an example for inventory carrying cost.
2. What is meant by economic order quantity?
3. What is probabilistic inventory model?
4. What are the objectives of inventory content?
5. Write a short note on dynamic inventory model.
6. Describe the inventory model with price break.
7. What are the basic assumptions in newsvendor problem?
8. What are the difference between dynamic programming and linear programming problem?
9. Explain
 - a) Reorder point
 - b) lead time
10. What is meant by forward recursion approach?

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

Weight 2 each.

11. Explain functional classification of inventories.
12. ABC manufacturing company purchase 1000 parts of a machine for its annual requirements, ordering one month usage at a time. Each part cost Rs. 20/-. The ordering cost per order is Rs. 15/- and the carrying charges are 15% of the average inventory per year. Determine the initial annual variable cost.
13. Explain EOQ model with price breaks.





14. Explain single period probabilistic model.
15. Explain fixed order quantity system and write the procedure for determining an optimal solution.
16. Explain the concept of single period instantaneous demand.
17. Use dynamic programming technique to

$$\text{Maximize } z = y_1 \cdot y_2 \cdot y_3$$

$$\text{Subject to } y_1 + y_2 + y_3 = 5$$

$$y_1, y_2, y_3 \geq 0$$
18. What is dynamic programming? Explain the advantages and disadvantages of dynamic programming.

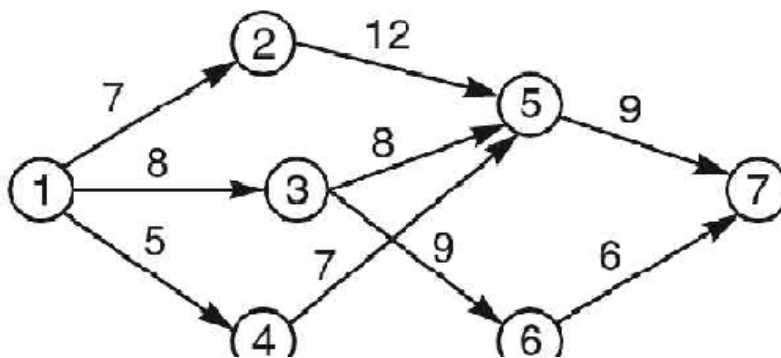
(6×2=12 weightage)

Part C (Essay Type Questions)

Answer any **two** questions.

Weight 5 each.

19. Describe the EOQ model with finite rate of replenishment with back order permitted.
20. Explain single period discrete probabilistic demand model.
21. A salesman located in a city A decided to travel to city B. he knew the salesman of alternative routes from city A to B. he then drew a highway network map as shown below. The city of origin A is city 1 The destination city B is city 7. Other cities through which the salesman have to pass through are numbered 2 to 9. The arrow representing routes between cities and distances in kilometers are indicated on each route. The salesman's problem is to find the shorted route that covers all the selected cities from A to B by using Dynamic programming method.



22. For a given set of items and knapsack capacity 7 kg. Find the optimal solution for the 0/1 knapsack problem making use of dynamic programming approach

Item	Weight	Value
A	1	1
B	3	4
C	4	5
D	5	7

(2×5=10 weightage)

