

Seat No. : _____

SL-105
September-2020
B.Sc., Sem.-VI
CC-310 : Statistics
(Operations Research) (New)

Time : 2 Hours]

[Max. Marks : 50

- Instructions :**
- (1) All Questions in Section-I carry equal marks.
 - (2) Attempt any **three** questions in Section-I.
 - (3) Question **9** in Section-II is compulsory.

SECTION – I

1. (A) Define operations research and discuss different types of models used in operations research. 7
(B) Discuss scope of operations research. 7
2. (A) Explain the graphical method of solving linear programming problems. 7
(B) Describe simplex method of solving linear programming problems. 7
3. (A) Explain North West Corner Method of solving a transportation problem. 7
(B) Explain the various steps of U-V method of solving a transportation problem. 7
4. (A) Explain Hungarian method for solving assignment problem. 7
(B) Explain Vogel's Approximation Method of solving a transportation problem. 7

5. (A) Compare and contrast CPM and PERT. Under what conditions would you recommend the scheduling by PERT ? 7
- (B) Explain the following terms in PERT : 7
- (i) Optimistic time
 - (ii) Most likely time
 - (iii) Pessimistic time
 - (iv) Expected time
6. (A) Explain different types of floats used in Network Analysis. 7
- (B) State the circumstances where CPM is a better technique of project management than PERT. 7
7. (A) Explain Maxi-Min and Mini-Max principle used in Game Theory. 7
- (B) Define : (i) Payoff matrix (ii) Pure and mixed strategies. 7
8. (A) Explain the general rules for dominance. 7
- (B) Explain the two-person zero-sum game, giving a suitable example. 7

SECTION – II

9. Answer any **four** : 8
- (A) What is linear programming ?
 - (B) Define feasible solution and basic feasible solution.
 - (C) What is degeneracy in transportation problems ?
 - (D) What is an assignment problem ?
 - (E) Define dummy activity and critical activity.
 - (F) What is looping in network diagram ?
 - (G) Define saddle point and give one limitation of game theory.
 - (H) Define fair game and strictly determinable game.

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SECTION – I

1. (A) Define operations research and discuss different types of models used in operations research. 7
(B) Discuss scope of operations research. 7
2. (A) Explain the graphical method of solving linear programming problems. 7
(B) What is the principle of duality in linear programming ? Explain its advantages. 7
3. (A) Explain North West Corner Method of solving a transportation problem. 7
(B) Explain the various steps of U-V method of solving a transportation problem. 7
4. (A) Explain Hungarian method for solving assignment problem. 7
(B) Explain table minimum method of solving a transportation problem. 7
5. (A) Give Johnson's method for determining the optimal sequence for processing n jobs on two machines. 7
(B) Explain gradual failure and sudden failure. 7
6. (A) What is no passing rule in a sequencing algorithm ? Explain the principal assumptions made while dealing with sequencing problems. 7
(B) Describe some important replacement situations. 7

7. (A) Compare and contrast CPM and PERT. Under what conditions would you recommend the scheduling by PERT ? 7
(B) Explain the following terms in PERT : 7
(a) Optimistic time
(b) Most likely time
(c) Pessimistic time
(d) Expected time
8. (A) Explain different types of floats used in Network Analysis. 7
(B) Give application areas of PERT/CPM techniques. 7

SECTION – II

9. Answer any **four** : 8
(A) What is linear programming ?
(B) Define slack and surplus variables in a linear programming problem.
(C) What is degeneracy in transportation problems ?
(D) What is an assignment problem ?
(E) What do you understand by total elapsed time ?
(F) Define sequencing problem.
(G) Define dummy activity and critical activity.
(H) What is looping in network diagram ?
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