



ST. JOSEPH'S COLLEGE (AUTONOMOUS), BENGALURU -27

B.Sc (Statistics) – 6th SEMESTER

SEMESTER EXAMINATION: APRIL 2024

(Examination conducted in May /June 2024)

ST 6223 : OPERATIONS RESEARCH

(For current batch students only)

Time: 2 Hours

Max Marks: 60

This paper contains 2 printed pages and 3 parts

PART-A

I. Answer any 5 questions out of 7 questions:

3x5 =15

1. Define operation research. Mention any two applications of it in the field of production management and finance.
2. Define the following terms in Linear Programming Problem(LPP) :
 - i) Feasible solution
 - ii) Degenerate basic feasible solution
 - iii) Infeasible solution
3. When the constraints of an LPP are having the inequality “ ≥ ” or “ = ” type, how to proceed further for finding solution to the problem.
4. Give the mathematical formulation of a Transportation Problem (T.P).
5. Define the following in Game theory:
 - i) Saddle point
 - ii) Mixed Strategy
 - iii) Two-person zero-sum game
6. Define the following terms in Network scheduling problem:
 - i) Dummy activity
 - ii) Merge events
 - iii) Total float
7. Define demand, lead time and reorder level in Inventory Theory.

PART-B

II. Answer any 5 questions out of 7 questions:

5x5 =25

8. Explain briefly the VAM algorithm of finding initial basic feasible solution to a T.P.
9. A) Explain the principle of dominance in game theory.
B) Define statistical decision theory. Give any two uses of it. (3+2)

10. A) Distinguish between CPM and PERT.
 B) Write a short note on P-system and Q-system of Inventory models. (2+3)
11. Explain briefly with standard notations the forward pass computation procedure for finding earliest starting time of events in CPM.
12. A) Distinguish between deterministic and probabilistic inventory models.
 B) Briefing the standard notations, write the expression for finding Economic Order Quantity (EOQ) and total optimal cost for an inventory model when shortages are allowed. (2+3)
13. Briefly discuss the various characteristics of queuing system.
14. Define the following terms in queuing theory:
 i) Steady state and transient state.
 ii) $M/M/\infty$ and Queue length
 iii) Traffic Intensity (2+2+1)

PART- C

III. Answer any 2 questions out of 3 questions: 10x2=20

15. A) Explain the procedure of solving $2 \times n$ game graphically.
 B) Describe the three time estimates in PERT. (6+4)
16. A) Explain the Simplex algorithm of finding optimal solution to any given LPP.
 B) Define set-up cost and carrying cost in inventory models. (8+2)
17. A) Stating the necessary assumptions, derive the expressions for EOQ and total optimal cost in Inventory models when shortages are not allowed.
 B) Write a short note on Kendall's notation for representing queuing models. (7+3)
