****

Register Number:

DATE:

**ST. JOSEPH’S COLLEGE (AUTONOMOUS), BANGALORE-27**

B.Sc. STATISTICS - VI SEMESTER

SEMESTER EXAMINATION - APRIL 2018

**ST 6214: Operations Research**

**Time: 3 Hours Maximum: 100 marks**

*This question paper has* ***TWO*** *printed pages and* ***THREE*** *parts.*

**PART - A**

**I Answer any TEN of the following: 10 x 3 = 30**

1. Define ‘Operations Research’?
2. Define a general linear programming problem.
3. What is meant by a basic feasible solution in an LPP
4. Define linear programming problem.
5. Write down mathematical model for assignment problem.
6. What is a two person zero sum game? And explain saddle point in a game problem.
7. Explain Hurwitz criterion in decision making environment
8. What is meant by slack or float in a network problem?
9. How is the mean and variance computed in a PERT network?
10. What is replacement theory? Mention its need.
11. What is economic order quantity?
12. Mention the need for maintaining inventory.

**II Answer any FOUR of the following: 4 x 10 = 40**

1. A) Define the following terms with respect to an LPP

 i) Slack variable ii) Surplus variable iii) Degenerate solution

B) Explain any procedure of obtaining an initial basic feasible solution in a transportation problem.

C) Describe the essential features of a queuing system (3+4+3)

1. Explain the procedure of obtaining an optimal solution to a Linear programming problem using the simplex algorithm. (10)

**ST\_6214\_A\_18**

1. A) Discuss the following costs with respect to an inventory problem. i. set up cost ii. Ordering cost iii. Holding cost iv. Shortage cost

B) Describe the graphical method of solving a 2xn game. (6+4)

1. A) Explain the Hungarian method of solving an assignment problem

B) List the differences between PERT and CPM. (6+4)

1. A) Discuss the various decision making situations that one can come across.

Explain the tools available used in decision making situations under risk.

 B) Derive an expression for EOQ when shortages are not permitted and also state the assumptions involved (5+5)

**III Answer any TWO of the following: 2 x 15 = 30**

1. A) Explain the terms i) float ii) total float iii) critical activity

B) Explain the method of obtaining the critical path for a network problem.

C) Explain Littles formula with usual notations. (3+7+5)

1. A) Explain the method of solving an unbalanced Transportation problem.

B) Distinguish between transient state and steady state. Describe M/M/1 queueing system and obtain the expected number of customers in the system for a ∞/FIFO queue. (6+9)

20. A) Write a note on different models used in Operations Research

B) Discuss the need for a replacement model.

C) What is mixed strategy? Discuss the principle of dominance used in solving a game

 problem. (5+5+5)

**ST\_6214\_A\_18**