B.Tech. 7th Semester, (F) Scheme (Fire Tech. and Safety)

Examination, December–2018

OPERATIONAL RESEARCH

Paper– FT–405–F

Time allowed : 3 hours] *[Maximum marks : 100*

Note: *Attempt **five** questions in total by selecting **one** question from each section. **Question No. 1 is compulsory.***

1. (a) What is the role of OR in decision making?

(b) What is the difference between simplex and dual simplex method?

(c) Define the term CPM.

(d) What is decision making?

Section–A

2. What is OR? Describe briefly its applications in Industry?

3. Use Big- M method to solve the following LP problem.

Maximize $Z = x_1 + 3x_2 - 2x_3$

Subject to $-x_1 - 2x_2 - 2x_3 = -6,$

$-x_1 - x_2 + x_3 \leq -2,$

$x_1, x_2, x_3 \geq 0$

Section–B

4. What do you understand by a balanced and an unbalanced transportation problem? How an unbalanced problem is tackled?

5. Prove that dual of a dual is primal.

Section–C

6. Obtain the steady state equation for the model M / M / 1 and derive the formula for average number of units in the queue and average waiting time of an arrival in the queue.

7. Write notes on resource levelling and resource smoothing.

Section–D

8. What is simulation? Describe the simulation process. What are the reasons for using simulation?

9. Explain the different methods useful for decision making under uncertainty.