Code No. 5051

FACULTY OF ENGINEERING

B.E. 4/4 (Civil) I - Semester **(Main)** Examination, December 2011

Subject : **Operation Research in Civil Engineering**
(Elective – I)

Time : 3 Hours Max. Marks: 75

Note: Answer **all** questions of Part – A. Answer any **five** questions from Part-B.

PART – A (25 Marks)

1. Mention different phases in Operations Research(OR). (2)
2. Briefly explain the applications of operation research. (3)
3. What are the advantages and limitations of linear programming (LP) models? (3)
4. What are artificial variables? (2)
5. What are the characteristics of dual problem? (3)
6. What is stochastic linear problem? (2)
7. What is quadratic problem? (2)
8. What are the applications of dynamic programming to Civil Engineering problems? (2)
9. Mention the limitations of Simulation. (3)
10. What are the uses of reliability? (3)

PART – B (5x10=50 Marks)

11.(a) Discuss the need of operation research in Civil engineering.
(b) Discuss various techniques of operation research.

12. Use Simplex method to

Minimize $Z = 5X + 4Y$

Subject to $4X + Y \geq 40$

$2X + 3Y \geq 90$

and $X, Y \geq 0$

13. Write the dual linear programming problem for the following primal and solve it

$Z_{max} = 150\ X_1 + 100X_2$

Subject to $8X_1 + 2X_2 \leq 8$

$4X_1 + 9X_2 \leq 10$

and $X_1, X_2 \geq 0$

14.(a) Define Separable programming.
(b) Enumerate various advantages of quadratic programming.

15.(a) Discuss on "Conversion of non-serial system to a serial system".
(b) What are the advantages and applications of Simulation?

16.(a) Discuss 'Random number generation'.
(b) Discuss 'Multi-stage decision process'.

17. Write short notes on the following :
(a) Classification of optimization problems
(b) Branch and bound method
(c) Monte-Carlo