

Code: 9A15601

R09

B.Tech III Year II Semester (R09) Supplementary Examinations December/January 2015/2016

MATHEMATICAL MODELING & SIMULATION

(Computer Science & Systems Engineering)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 A firm manufactures two products in three departments. Product 'A' contributes Rs.5 per unit and requires 5 hrs in department M, 5 hrs in department N and one hour in department P. Product 'B' contributes Rs.10 per unit and requires 8 hrs in department M, 3 hrs. in department N and 8 hrs in department P. Capacities for departments M, N, P are 48 hrs per week. Find out optimal product mix using simplex model. Also give the dual formulation.
- 2 Derive formula for optimum batch quantity if the demand is continuous at a constant rate assuming appropriate data.
- 3 Solve the following LPP:
Maximize $Z = 10X + 15Y$
Subject to $Y \geq 3$; $X - Y \geq 0$; $Y \leq 12$
 $X + Y \leq 30$; $X \leq 20$ and $X, Y \geq 0$.
- 4 Describe about travelling sales persons algorithm in detail with a suitable example.
- 5 Write a short note on:
 - (a) Continuous review models.
 - (b) Single-period models.
 - (c) Multi-period model.
- 6 Explain about simulation software application in detail.
- 7 Discuss about pure birth and death models and Pollaczek-Khinchine (P-K) formula.
- 8 Explain about statistical analysis for terminating simulation, and statistical analysis for steady-state parameters.
