

35091

M.Sc. DEGREE EXAMINATION, OCTOBER 2015.

THIRD SEMESTER

Computer Science

Paper I — COMPUTER ORIENTED OPERATIONAL RESEARCH

Time : Three hours

Maximum : 75 marks

(No additional sheet will be supplied)

PART A — (5 × 3 = 15 marks)

Answer any FIVE questions.

Each question carries 3 marks.

Each answer should not exceed 1 page.

1. What is meant by N/FIFO model?
2. What is a basic feasible solution?
3. Define Queueing system.
4. Define Total float with reference to a PERT chart.
5. What is simulation? Uses?
6. What is artificial variable?
7. Distinguish balanced and unbalanced transportation problems.
8. What is an exponential distribution?

PART B — (4 × 15 = 60 marks)

Answer ALL questions.

Each question carries 15 marks.

Each answer should not exceed 6 pages.

9. Using dual Simplex method  
Minimize :  $z = 6x_1 + x_2$   
Subject to the constraints  $2x_1 + x_2 \geq 3$   
 $x_1 - x_2 \geq 0$   
 $x_1, x_2 \geq 0$ .

Or

10. Explain degeneracy in transportation problem.

11. (a) What is assignment problem? Give two areas of its applications.  
 (b) How far sensitivity analysis is relevant to assignment? Discuss.

Or

12. (a) Solve the following  $2 \times 4$  game graphically :

		Player B			
		B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>	B <sub>4</sub>
Player A	A <sub>1</sub>	2	1	0	-2
	A <sub>2</sub>	1	0	3	2

- (b) What is a game with mixed strategies? How do we solve them?

13. The mean rate of arrival of planes at an airport during the peak period is 20 hour, but the actual number of arrivals in any hour follows a Poisson distribution with the respective averages. When there is congestion, the planes are forced to fly over the field in the stack awaiting the landing of other planes that arrived earlier.

- (a) How many planes would be flying over the field in the stack on an average in good weather and in bad weather?  
 (b) How long a plane would be in the stack and in the process of landing in good and in bad weather?

Or

14. (a) What do you mean by a queue? Give some applications of queueing theory.  
 (b) Give the classification of queueing models.
15. (a) What is the difference between the time estimates of a PERT activity and a CPM activity?  
 (b) What are the applications of PERT and CPM?

Or

16. (a) Explain the use of simulation technique in different optimization studies giving one example of each case.  
 (b) Explain in detail a procedure of generating random numbers from a non-uniform distribution. Use this procedure and generate four random observations from a normal distribution with mean 4 and standard deviation 2.5.