

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ME) (O.E. 2011 Onwards) (Sem.-7,8)

OPERATION RESEARCH

Subject Code : IT-310

M.Code : 72221

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A** is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. **SECTION-B** contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. **SECTION-C** contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

SECTION-A

1. Answer briefly :

- (a) Write any two merits of OR.
- (b) What are the limitations of graphical method?
- (c) What do you understand by unbalanced assignment problem?
- (d) Write the applications of Simulation.
- (e) What are the applications of queuing theory?
- (f) Define total time in the system in queuing model.
- (g) Write two limitations of linear programming.
- (h) Define Independent Float.
- (i) Name three phases of project management.
- (j) Name any four mathematical models.

SECTION-B

2. Using the graphical method maximize to

$$Z = 3x_1 + 4x_2$$

subject to : $5x_1 + 4x_2 \leq 200$;

$$3x_1 + 5x_2 \leq 150;$$

$$5x_1 + 4x_2 \geq 100;$$

$$8x_1 + 4x_2 \geq 80;$$

$$x_1, x_2 \geq 0$$

3. Write a note on Integer Programming Model.
4. Discuss the steps in Goal Programming Model Formulation.
5. What are the elements of a queuing system?
6. What is duality theory? What are the rules to form a dual problem from the primal problem?

SECTION-C

7. Find the basic feasible solution of the following transportation problem :

| | W₁ | W₂ | W₃ | W₄ | W₅ | Available |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|------------------|
| F₁ | 4 | 3 | 1 | 2 | 6 | 80 |
| F₂ | 5 | 2 | 3 | 4 | 5 | 60 |
| F₃ | 3 | 5 | 6 | 3 | 2 | 40 |
| F₄ | 2 | 4 | 4 | 5 | 3 | 20 |
| Required | 60 | 60 | 30 | 40 | 10 | 200 |

8. Solve the assignment problem

| | 1 | 2 | 3 | 4 | 5 |
|----------|----------|----------|----------|----------|----------|
| A | 11 | 17 | 8 | 16 | 20 |
| B | 9 | 7 | 12 | 6 | 15 |
| C | 13 | 16 | 15 | 12 | 16 |
| D | 21 | 24 | 17 | 28 | 26 |
| E | 14 | 10 | 12 | 11 | 13 |

9. Explain the similarities and differences between CPM and PERT.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.