

Roll No.

24478

**B. Tech 7th Semester (ME)
Examination – May, 2018**

OPERATION RESEARCH

Paper : ME-405-F

Time : Three Hours]

[Maximum Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

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

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|----------------------------------------------|---|
| 1. (a) Discuss Simon model. | 5 |
| (b) What is travelling salesman problem ? | 5 |
| (c) Give various applications of simulation. | 5 |
| (d) Give savage principle. | 5 |

SECTION - A

2. (a) Define operations research and discuss its development. 10
- (b) Discuss applications and limitations of OR industry. 10
3. (a) Solve by graphical method : 10
- Maximize $5x_1 + 3x_2$
- Subject to $3x_1 + 5x_2 \leq 15$
- $5x_1 + 2x_2 \leq 10; x_1, x_2 \geq 0$
- (b) Write the dual of the above problem and solve the dual by simplex method. 10

SECTION - B

4. (a) Discuss the use of sensitivity analysis for post optimal problems. 10
- (b) Describe the transportation problem and give its mathematical model. 10
5. A small garment making unit has five tailors stitching five different types of garments. All the five tailors are capable of stitching all the five types of garments. The

output per day per tailor and the profit (Rs.) for each type of garments are given below : 20

Tailors	Garments				
	1	2	3	4	5
A	7	9	4	8	6
B	4	9	2	7	8
C	8	5	2	9	8
D	6	5	8	10	10
E	7	8	10	9	9

- (i) Find the optimal assignment of garments to tailors.
- (ii) If tailor E is absent for a specified period and no other tailor is available, what should the optimal assignment.

SECTION - C

6. Based on the following data, draw the network and determine (i) Critical Path (ii) Project completion time (iii) Total float. 20

Activity	1-2	1-3	1-4	2-5	2-6	3-6	3-7	4-7	5-8	6-8	7-8
t_o	7	10	5	50	30	50	1	40	5	20	30
t_p	17	60	15	110	50	90	9	68	15	52	50
t_m	9	20	10	65	40	35	5	48	10	27	40

7. (a) Differentiate b/w PERT and CPM. 10
- (b) Explain the basic queuing process. State the meaning of queue discipline and give its role in queuing problem. 10

SECTION - D

8. What is decision theory ? Describe some methods which are useful in decision-making under uncertainty. 20
9. (a) What is simulation ? Describe the simulation process. 10
- (b) Distinguish between deterministic and stochastic simulation models. 10
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