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GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER- VII (New) EXAMINATION - WINTER 2019

Subject Code: 2172011 Date: 03/12/2019 **Subject Name: Production Optimization Techniques**

Total Marks: 70 Time: 10:30 AM TO 01:00 PM

Instructions:

- 1. Attempt all questions.
- 2. Make suitable assumptions wherever necessary.
- 3. Figures to the right indicate full marks.

MARKS

(a) Explain the evolution of modern management. **Q.1**

04

(b) What do you meant by a feasible solution of an LPP? (c) Explain application of linear programming.

07

03

- **Q.2** (a) Explain how a profit maximization transportation problem can be converted to an equivalent cost minimization transportation problem.
- 03
- Find the initial basic feasible solution for given problem by using least cost method:

04

	D1	D2	D3	D4	Supply
P1	2	3	11	7	6
P2	1	0	6	1	1
P3	5	8	15	9	10
Demand	7	5	3	2	

(c) Use the Big-M method to solve the following LPP

07

Maximize $Z=5X_1+3X_2$ Subject to constraints,

 $2X_1 + 4X_2 \le 12$, $2X_1 + 2X_2 = 10$,

 $5X_1 + 2X_2 \ge 10$ and $X_1, X_2 \ge 0$.

OR

(c) Use the two-phase method to solve the following LPP

07

Minimize $Z=X_1+X_2$

Subject to constraints,

 $2X_1 + X_2 \ge 4$, $X_1 + 7X_2 \ge 7$ and $X_1, X_2 \ge 0$.

(a) What is an assignment problem? Give the applications also. Q.3

03

- What are the methods used for solving an assignment problem? **(b)**
- Apply MODI method to obtain optimal solution of transportation problem: (c)

04
07

	D1	D2	D3	D4	supply
S 1	19	30	50	10	7
S2	70	30	40	60	9
S 3	40	8	70	20	18
Demand	5	8	7	14	34

Q.3 (a) What is the need of Decision tree analysis?

03

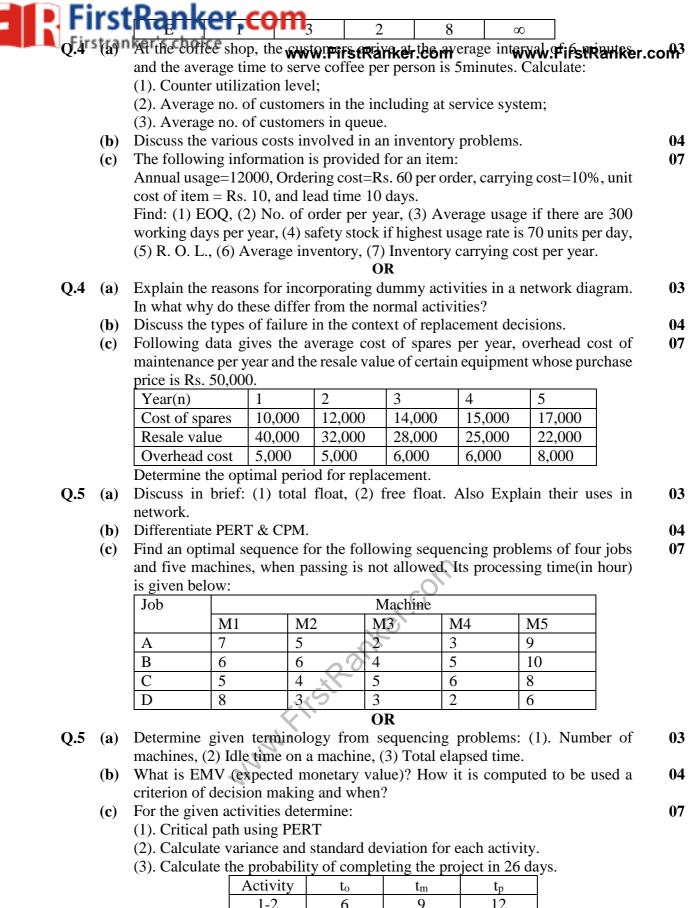
(b) Explain the Kendall's notation for Queuing models.

04

A travelling salesman has to visit five cities. He wishes to start from a particular city, visit each city once and then return to his starting point. Suggest him such that his constraint is fulfilled as well as he consumes least cost. The travelling cost of each city from a particular city is given below:

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	A	В	C	D	Е
A	8	2	5	7	1
В	6	8	3	8	2
С	8	7	∞	4	7
D	12	4	6	8	5



Activity	$t_{\rm o}$	$t_{ m m}$	t_{p}
1-2	6	9	12
1-3	3	4	11
2-4	2	5	14
3-4 3-5	4	6	8
3-5	1	1.5	5
2-6	5	6	7
4-6	7	8	15
5-6	1	2	3
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