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Reg. No. | | | | | | | | |

II Semester M.B.A. (Day & Evening) Degree Examination,
November/December - 2025
MANAGEMENT
Production and Operations Research
(CBCS Scheme 2019 Onwards)
Paper : 2.6

Time : 3 Hours **Maximum Marks : 70**

SECTION - A

Answer any Five questions from the following. Each question carries 5 marks. **(5×5=25)**

1. Discuss the main differences between product layout and process layout in facility planning.

2. Discuss ABC and FSN analysis for inventory classification and control.

3. What is Six Sigma? Explain its importance in quality management.

4. Solve the following LPP graphically.

$$\text{Max } Z = 16000x_1 + 14000x_2$$

Subject to $6x_1 + 2x_2 \leq 132$,

$2x_1 + 2x_2 \leq 90$

$x_1 \leq 40$

$x_2 \leq 80$

$x_1, x_2 \geq 0$

5. A Tata Engineering company wants to assign five jobs to five persons. If only one job can be assigned to one person, determine the optimum assignment.

		Job				
		1	2	3	4	5
	A	8	4	2	6	1
	B	0	9	5	5	4
Person	C	3	8	9	2	6
	D	4	3	1	0	3
	E	9	5	8	9	5

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6. A certain transport company operating in Rajasthan has a fleet of 20 trucks. A truck costs Rs.1,75,000. From past experience, the transporting company has following information:

Age of Truck	1	2	3	4	5	6
Maintenance Cost(Rs.)	15,600	20,000	27,000	45,000	85,000	98,000
Salvage Value (Rs.)	1,10,000	95,000	88,000	70,000	60,000	45,000

What is the optimum replacement period?

7. Obtain an initial basic feasible solution to the following transportation problem:

		Store I	II	III	IV	Availability
	A	7	3	5	5	34
	B	5	5	7	6	15
Warehouse	C	8	6	6	5	12
	D	6	1	6	4	19
	Demand	21	25	17	17	80

SECTION - B

Answer any Three questions from the following. Each question carries 10 marks. **(3×10=30)**

8. Explain procurement procedures including bid system, vendor selection and development in a manufacturing unit.

9. Solve the following LPP using Simplex method.

Max $Z = 4000x_1 + 2000x_2 + 5000x_3$

Subject to; $12x_1 + 7x_2 + 9x_3 \leq 1260$

$22x_1 + 18x_2 + 16x_3 \leq 19008$

$2x_1 + 4x_2 + 3x_3 \leq 396$

$x_1, x_2, x_3 \geq 0$

10. Find the sequence, for the following eight jobs, that will minimize the total elapsed time for the completion of all the jobs. Each job is processed in the order CAB.

		Jobs 1	2	3	4	5	6	7	8
	A	8	12	6	8	10	6	12	4
Machines	B	16	20	14	16	22	16	18	26
	C	10	12	4	6	8	18	30	22

11. A project has the following times schedule :

Activity	Preceding Activity	Expected Completion Time (in weeks)
A	None	5
B	A	2
C	A	6
D	B	12
E	D	10
F	D	9
G	D	5
H	B	9
I	C, E	1
J	G	2
K	F, I, J	3
L	K	9
M	H,G	7
N	M	8

Construct network and compute:

a) Find the critical path and the project completion time

b) Prepare an activity schedule showing the ES, EF, LS and LF for each activity.

SECTION - C

(1×15=15)

12. **Compulsory Case Study :**

Obtain an initial basic feasible solution using VAM and check its optimality.

		Warehouse						
		P	Q	R	S	T	U	Available
Factory	A	5	3	7	3	8	5	3
	B	5	6	12	5	7	11	4
	C	2	1	3	4	8	2	2
	D	9	6	10	5	10	9	8
	Required	3	3	6	2	1	2	17