

- N.B. :** (1) Question No. 1 is compulsory.
 (2) Solve any four questions from the remaining questions.
 (3) Assume suitable data if required.
 (4) Figures to the right indicate full marks.

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 MASTER

1. Write short notes on any four of the following :-

- MRP
- MRP II
- Capacity Planning
- Purchasing in MPC
- EDI
- Lot sizing and its considerations.

2. (a) Two products X and Y are to be manufactured by firm. Each of these products requires processing on two machines M_1 and M_2 . Product X requires 5 hours on machine M_1 and 6 hours on m/c M_2 . Product Y requires 6 hours on m/c M_1 and 3 hours on machine M_2 . The available capacity per month is 150 hours and 125 hours for Machines M_1 and M_2 respectively. The profit per unit is Rs. 20/- each, Rs. 10/- on product X and Y respectively. Estimate the No. of units of each type to be produced per month for maximum profit. 10

- (b) Explain the following :- 10

- Demand Forecasting
- Demand Management and MPS.

3. (a) Find the job sequencing and find out the total elapsed time of the following : 10

Machines Jobs	Lathe	Drilling	Reaming
1	4	5	1
2	6	2	4
3	3	5	2
4	7	3	4
5	2	5	6
6	3	4	5

- (b) Find the optimal assignment (Effectiveness matrix in man-hours needed) : 10

Job Man	A	B	C	D
1	5	3	2	8
2	7	9	2	6
3	6	4	5	7
4	5	7	7	8

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4. A project consist of following six activities :-

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Activity	Normal Time N(t)	Crash Time (ct)	Normal Cost	Crash Cost
1-2	3	2	1600	1800
1-3	7	5	1400	2000
2-3	5	3	2500	3000
3-4	4	3	500	800
3-5	2	1	4200	4400
4-5	8	6	1600	2600

- Draw the network for the activities stated above.
- Locate Critical Path.
- Calculate Total Project Duration and its Cost.
- If the duration of project to be reduced by 1 week, which activity or activities duration to be reduced ? What will be the total project cost ?

5. (a) Solve the following problem by simplex method :

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$$Z_{\max} = 2x_1 + 3x_2$$

s.t.

$$x_1 + x_2 \leq 10$$

$$2x_1 + 3x_2 \leq 5$$

$$x_1, x_2 \geq 0.$$

- A company manufacturing washing machine establishes a fact that there is a relationship between sale of washing m/c and population of city. The market research carried out reveals the following information :

Population (Millions)	5	7	15	22	27	36
No. of Washing m/c Demand (000)	28	40	65	80	96	130

Fit linear regression equation and estimate the demand for washing m/c for a city with population of 50 millions.

- Complete the MRP plan for the item X shown below. Note that this item has an independant demand that necessitates a safety stock of 40 units to be maintained.

Order Quantity = 70 Lead Time = 4 weeks Safety Stock = 40		Week											
		1	2	3	4	5	6	7	8	9	10	11	12
Project Requirements		20	20	25	20	20	25	20	20	30	25	25	25
Scheduled Receipts			70										
On hand at the end of period		65											
Planned Order Released													

- Explain in detail Input and Outputs of CRP with flow of information in it. Draw flow diagram.

7. (a) Define Aggregate Planning. Discuss its objectives. Also explain shop floor control in MPC.

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- Describe the functions of Vendor Development and what are the factors to be considered for selection of Vendor ?

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8. (a) Explain JIT Philosophy with JIT concept in context of MRP.

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- Explain seven wastes of JIT in detail. Define Agile Manufacturing.

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