

(Time: 3 Hours)

Total Marks: 80

Note:-

1. Question Number **ONE** is compulsory.
2. Attempt any **THREE** questions from remaining **FIVE** questions.
3. Assume suitable data if necessary.



Q1 Attempt **any four** question from the following:

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|----------|--|----|
| a | Explain need of Demand Forecasting | 05 |
| b | Explain ERP | 05 |
| c | Explain Disaggregating the aggregate plans | 05 |
| d | Explain Rough-cut Capacity Planning | 05 |
| e | Need of MPC system | 05 |

Q2 a A FMCG Prestige Ltd., company based at Mumbai, manufactures the consumer durable products. The company intends to develop an aggregate plan for six months starting from July 2019 to December 2019. The company has provided the following details. 10

Month	July	August	September	October	November	December
Demand forecast	600	780	850	950	860	1000
Number of Working days	22	19	21	18	20	21

Working hours per day: 8 Hours, Inventory carrying cost: Rs. 10/unit/month, Shortage cost = Rs. 20/unit/month, Estimated cost of hiring and training of workers: Rs. 50 per worker, Cost of firing the workers: Rs. 100 per worker, production hours required = 5 hours/unit, regular time production cost = Rs. 15/hour, overtime cost = Rs. 18/hour.

Initially there are 10 workers in the company. Assuming beginning inventory as 250 units and no safety stocks are required, advise the production manager on following aggregate plans while calculating the overall costs involved.

I) produce exactly to meet demand by varying the workforce size (keep the utilization of workers and inventory size constant).

II) Maintain constant workforce and vary inventory and allow shortages. (No subcontracts are available).

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| b | Explain eight costs of Aggregate Planning | 10 |
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Q3 a Explain MPC system framework 10

b Explain role of Capacity Planning in MPC and control Techniques 10

- Q4 a** Discuss in detail different strategies of aggregate planning. 10
- b** The following table shows the sales figure (in thousands) for 10 periods. This data is used to test two different basic exponential smoothing models. The first model uses $\alpha = 0.1$ and the second model uses $\alpha = 0.5$. In both cases, the exponential smoothing forecast for period 1 made at the end of period zero is 50 units. Estimate the demand forecast of the period 11 using both the models. Also calculate the forecast for period 11 and 12 by least square method and compare the result. 10

Period	Demand (in 1000's units)	Period	Demand (in 1000's units)
1	51	6	38
2	46	7	51
3	49	8	48
4	55	9	60
5	52	10	51

- Q5 a** An Electronics India Ltd., company manufactures two products namely product X and product Y. The marketing department of the company has provided the following data on sales forecast for the coming five years, machine capacity and operator requirement. 10

	Demand forecast (no. of units)					Machine Capacity (units per year)	Number of machines available	Number of operators on each machine
	Year 1	Year 2	Year 3	Year 4	Year 5			
Product X	16400	19500	21700	23500	25600	10000	4	3
Product Y	5550	6710	8270	9160	9840	5000	2	2

Determine capacity utilization, number of machines and operators required to make sure that demand forecast for the coming years are met. Also discuss what is meant by capacity of facility and different ways of expressing it.

- b** Explain seven wastes involved in JIT 10
- Q6** Write short notes on (Any Four)
- a** MRP 05
- b** Extending MPC integration to customers 05
- c** PAC Techniques 05
- d** Information Use in Demand management 05
- e** Bill of Materials Structuring for MPS 05
