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**MBA – MARKETING/FINANCE/HR/
PRODUCTION & OPERATIONS
MANAGEMENT (MBABM)**

Term-End Examination

June, 2015

**MBME-022 : PRODUCTION PLANNING AND
CONTROL**

Time : 3 hours

Maximum Marks : 100

Note :

- (i) *Section I is compulsory.*
 - (ii) *In Section II, solve any **five** questions.*
 - (iii) *Assume suitable data wherever required.*
 - (iv) *Draw suitable sketches wherever required.*
 - (v) *Italicized figures to the right indicate maximum marks.*
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SECTION I

1. Read the following case and answer the questions :

Kalpataru Industries has a 6 months demand cycle for one of their products as shown below :

MONTHS	FORECAST DEMAND (Units)	Working days/months
January	300	25
February	600	20
March	400	21
April	400	21
May	200	24
June	300	25

The company works on a single shift basis of 8 hours per shift. Each unit requires 2 labour-hours to be produced at a labour cost of ₹ 70 per hour (Regular Rate) or ₹ 100 per hour (Overtime rate). Units can be subcontracted at a cost of ₹ 300 per unit whereas the in-house manufacturing cost is estimated at ₹ 200 per unit in regular production. (including labour and other overheads). There are currently 20 workers employed in the company. The hiring

and training cost of the additional workers is ₹ 2,000 per person whereas the lay-off cost is ₹ 3,000 per person. Company's policy is to retain a safety stock of 25% of monthly forecast and each month's safety stock becomes the beginning inventory for the next month. The beginning inventory in January is 50 units and the inventory carrying cost is estimated to be ₹ 5 per unit per month. Stock out cost is estimated as ₹ 100 per unit per month. Two aggregated plans are proposed as below :

Plan 1 : Vary the workforce size to accommodate demand.

Plan 2 : Maintain the constant workforce of 20 and build inventory or incur stock out cost.

Evaluate these plans and decide the best one. 15+15

SECTION II

2. Rama Industries manufacturing Process Plant Equipments, purchases booster pumps and fans from BB International Company Ltd. (Annual requirement is 3,000 and 5,000 units respectively). Owing to the large number of raw materials required for fabricating various equipments, Rama Industries always faces challenges to store the raw material in an optimal manner in their store room. They have made a separate section in their store room to store booster pumps and fans as these are in large need always. The storage capacity in the store room for these items is 10,000 square feet, while the space required for storing a booster pump and a fan is 9 square feet and 4 square feet respectively.

Following are the details about the material :

Material	Booster pump	Fan
Carrying cost (₹ per unit per year)	200	150
Ordering cost (₹ per order)	100	100
Price per unit (₹)	3,000	2,500

Determine the optimal order quantities per order for

- (i) Booster pump and
(ii) Fan

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3. (a) A company has recorded the following data for one of its items :

- Mean Demand = 600 gm per day
- Standard Deviation (σ) = 60 gm
- Lead Time = 8 days
- Risk of Stock out acceptable = 2%
(Service factor 2.05)

Calculate Safety Stock and Reorder Point. 4+4

(b) Which type of inventory model is assumed by the above problem ? Explain the assumptions for the model. 2+4

4. The Demand During Lead Time (DDLT) for beverages required in international air flights is as below :

Item Quantity (Number of bottles in hundreds)	22	21	24	23
Demand (Number of times)	22	28	16	34

The carrying cost and stock out cost for an item per month is ₹ 2 and ₹ 2.5 respectively.

Determine the :

- (i) Optimal Buffer Stock 5
- (ii) Safety Stock 5
- (iii) Reserve Stock 4

5. (a) Project and sales forecasting is done by using various mathematical expressions. $y = ae^{bx}$ is one of them. How will you use this expression ?
Consider suitable example and explain. 6
- (b) How will you exercise the principles of Production Planning and Control (PPC) in the operations of a hospital ? 8
6. (a) How are Kan Ban and JIT associated with each other ? Explain with at least two examples. 8
- (b) How will you employ (i) Affinity diagram (ii) Interrelationship diagram in implementing a Kan Ban system ? 3+3
7. For components in Automobile industry, ABC and FSN analysis is to be made jointly. Justify the above statement by considering the aspects viz. Usage of Matrix, type of approach, etc. 14
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