Operations Management VTU CBCS Question Paper Set 2018

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10ME81

Eighth Semester B.E. Degree Examination, Dec.2017/Jan.2018
Operations Management

Time: 3 hrs. Max. Marks:100

Note: *Answer FIVE full questions, selecting at least TWO questions from each part.*

PART – A

1 a. Explain briefly with a schematic model the functions within business organization and operation management. **(08 Marks)**

b. Define operation management. Explain the classification of production systems. **(06 Marks)**

c. Define productivity. List the various factors affecting productivity. Mention how it can be improved. **(06 Marks)**

2 a. What is decision making? Explain the frame work for decision making. **(06 Marks)**

b. Briefly explain the characteristics of operation decision. What is Break even analysis? Explain. **(08 Marks)**

c. Jindal steels Ltd. is planning to start a new factory for manufacturing steel utensils. It is considering three location options namely Bengaluru, Shimoga and Bellary. The fixed cost at these locations have been estimated at ₹ 8.15 million, ₹ 7.377 million and 7.903 million respectively. The variable costs at the three locations are estimated at ₹ 500 per unit, ₹ 580 per unit and ₹ 490 per unit respectively. The factory will have an annual production capacity of 10000 units and in the initial year it will operate at 75% efficiency. Find the best location option, which has the lowest total cost of production. **(06 Marks)**

3 a. What is forecasting? List the steps involved in forecasting process. **(04 Marks)**

b. Explain the moving average and simple exponential smoothing methods of forecasting. **(08 Marks)**

c. The Table below gives a sales record of a firm. Determine the regression line for the firm and find the forecast of sales in the month of January for next year **(08 Marks)**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
90	111	99	89	87	84	104	102	95	114	103	113

4 a. Distinguish between design capacity and system capacity. **(04 Marks)**

b. Explain the various factors that influence the location of plants. **(06 Marks)**

c. What is facility layout? What factors determines the type of layout used in an organization? **(05 Marks)**

d. Sketch and explain any two types of layouts. **(05 Marks)**

PART – B

5 a. Briefly explain the following with the help of a flow chart:
(i) Aggregate planning. (ii) Master scheduling **(08 Marks)**

b. A company produces mini computers that have a seasoned demand patterns. The available production capacity during regular time and overtime, as well as cost data are shown in the table below:

Period	Available capacity units			Demand Forecast units
	RT	OT	SC	
1	60	18	1000	100
2	50	15	1000	50
3	60	18	1000	70
4	65	20	1000	80

Initial inventory = 20
Final inventory = 25
Total cost/unit (Regular time) = ₹ 100/-
Overtime cost/unit = ₹ 125/-
Sub contract cost/unit = ₹ 130/-
Carrying cost unit/period = ₹ 2
Using transportation. **(12 Marks)**

6 a. What you mean by inventory? What are the types of inventory? **(04 Marks)**
b. Define ABC analysis, EOQ and ordering cycle. **(06 Marks)**
c. Calculate the economics lot size with uniform date of demand and instantaneous replacement. Give total costs and total annual costs. **(06 Marks)**
d. An industry estimates that it will sell 12000 units of its product for the next year. The ordering cost is ₹ 100 per order and the carrying cost per unit per year is 20% of the purchase price per unit. The purchase price per unit is ₹ 50.
Find (i) EOQ (ii) Number of orders per year (iii) Time between successive orders. **(04 Marks)**

7 a. Define MRP and with a block diagram, explain the various inputs to an MRP system. **(10 Marks)**
b. What is ERP? Write the benefits and limitations of MRP. **(05 Marks)**
c. A work centre operates 6 days a week on a two shifts per day basis (8 hours per shift). It has four machines with the same capacity. If the machines are utilized 75% of the time at a system efficiency of 90%, what is the rated output in standard hours per week? **(05 Marks)**

8 a. Why has purchasing and supply chain management assumed to be importance in today's organizations? **(08 Marks)**
b. Briefly explain the following:
(i) Vendor development
(ii) E-procurement.
(iii) Concept of tenders.
(iv) Make or buy decision. **(08 Marks)**
c. Define vendor rating. Explain the steps involved in the vendor rating. **(04 Marks)**

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10ME/PM/TL81

Eighth Semester B.E. Degree Examination, June / July 2014
Operations Management

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

PART - A

1 a. Define Operation Management. Give the classification of production systems. **(06 Marks)**

b. Explain in brief the functions of operations management. **(06 Marks)**

c. Define productivity. List the various factors affecting productivity. **(08 Marks)**

2 a. What is Decision Making? What are the steps involved in decision making? **(06 Marks)**

b. Briefly explain the characteristics of operations decision and the frame work for decisions. **(08 Marks)**

c. What is break even analysis? Explain. **(06 Marks)**

3 a. What is forecasting? List the steps involved in forecasting process. **(05 Marks)**

b. Briefly explain the various factors affecting forecasting. **(05 Marks)**

c. A company believes that its annual profit depend on its expenditure for research. The information for the preceding 6 years is given in the table below. Estimate the profit when the expenditure for research is 6 units. Also compute the values for slope and intercept. **(10 Marks)**

Expenditure for Research (X)	2	3	5	4	11	5	6
Annual profit (Y)	20	25	34	30	40	31	□

4 a. Define : i) Design capacity ii) System capacity and iii) Capacity planning. **(06 Marks)**

b. What are the factors influencing plant location? **(06 Marks)**

c. An automobile component manufacturer has the plan of buying a moulding machine which can manufacture 17000 parts / year. The moulding m/c is a part of product line and its efficiency is 85%. i) What is the required system capacity ii) Assume that 100 seconds time is required to mould each part and the plant operates for 2000 hours/year. If the mould machines are used for 60% of the time and are 90% efficient, what is the output of moulding machines / hour iii) How many moulding machines would be required. **(08 Marks)**

PART - B

5 a. Briefly explain the following with the help of a flow chart :
i) Aggregate planning ii) Master scheduling. **(08 Marks)**

b. A firm has developed the following demand forecast in units for an item which is influenced by seasonal factors :

Month	Jan	Feb	March	April	May	June	July	Aug
Forecast Demand	270	220	470	670	450	270	200	370
Cumulative Demand	270	490	960	1630	2080	2350	2550	2920

Suppose that the firm estimates that it costs Rs 150/unit to increase the production rate, Rs 200/unit to decrease the production rate, Rs 50/unit per month to carry the items on inventory and Rs 100 per unit if subcontracted. Compare the cost incurred if pure strategies are followed. **(12 Marks)**

6 a. What do you mean by inventory? What are the types of inventories? **(04 Marks)**

b. What are the major costs associated with inventories? What are the reasons for carrying inventories? **(06 Marks)**

c. A producer of photo equipment buys lenses from a supplier at 100 dollars each. The producer requires 125 lenses/year and the ordering cost is 18 dollars/order. Carrying costs/unit year are estimated to be 20 dollars each. The supplier offers a 6% discount for purchases of 50 lenses and an 8% discount for purchases of 100 or more lenes at one time. What is the most economical amount to order at a time? **(10 Marks)**

7 a. Define Materials Requirement planning. What are the basic inputs for MRP? **(06 Marks)**

b. What are the benefits and limitations of MRP? **(08 Marks)**

c. Briefly explain the following : i) MRP – II ii) ERP. **(06 Marks)**

8 a. Briefly explain the importance of purchasing and supply chain management. **(06 Marks)**

b. Write a note on Make or Buy decision. **(05 Marks)**

c. Briefly explain the following :

i) Vendor development.

ii) E – procurement.

iii) Concept of tenders. **(09 Marks)**

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10ME/PM81

Eighth Semester B.E. Degree Examination, June/July 2015
Operations Management

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

PART – A

1 a. Explain 'Scientific Management' and its origin. **(05 Marks)**

b. What is 'Operations Management? **(05 Marks)**

c. What is 'Productivity'? Mention how it can be improved. **(05 Marks)**

d. Suppose a company produced 300 standard book cases last week using 8 workers and it produced 240 standard book cases this week using 6 workers. In which week was productivity higher? **(05 Marks)**

2 a. Explain what 'Uncertainty' is and how this can be overcome in operations management. **(08 Marks)**

b. Explain 'Bayes Theorem' with notations. A study of old buses shows the probability of an accident by over speeding is 0.8, and the probability of over speeding alone is 0.3. The probability of an accident occurring due to non overspeeding reduces to 0.1. Recently an accident occurred. What is the probability that the bus was overspeeding? **(06 Marks)**

c. Maximize $3x_1 + 5x_2$, given $x_1 + 2x_2 \geq 2000$, $x_1 + x_2 \geq 1500$, $x_2 \geq 600$ by graphical method. **(06 Marks)**

3 a. Explain the 'Moving Average' and 'Simple Exponential Smoothing' methods of forecasting. **(08 Marks)**

b. Explain 'Linear Regression' method for trend analysis by least squares. Explain any simplification possible. **(06 Marks)**

c. The data given below refers to past sales for last eleven years. Using least squares estimate sales forecast for the next two years. Also use 'Moving Average' for 3 years and compare the forecasts. **(06 Marks)**

Year	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Sales Rs. × 1000	35	50	48	47	50	55	65	77	92	86	100

4 a. How do you define 'capacity' and how do you measure it? A factory wishes to acquire stamping machines to produce 30,000 T shirts per month. They operate 200 hours per month but the machines will be used of 75% of the time only and output is 5% defective. A stamping operation takes one minute per T-shirt. Assuming 95% efficiency, how many machines are required? **(12 Marks)**

b. Define 'Plant Layout'. Mention the main types of 'Processing Layouts'. **(08 Marks)**

PART – B

5 a. Define 'Aggregate Planning'. Define 'Master Scheduling'. What are the differences, if any? **(04 Marks)**

b. Mention the strategies for 'Aggregate Planning'. **(06 Marks)**

c. Big Mart maintain a constant work force which can produce 3000 tables per quarter. The annual demand is 12000 units and is distributed seasonally in accordance with quarterly indexes $Q_1 = 0.80$, $Q_2 = 1.40$, $Q_3 = 1.00$, $Q_4 = 0.80$. Inventories are accumulated when demand is less than capacity and are used up during periods of strong demand. To supply the total demand i) How many tables must be accumulated each quarter? ii) What inventory must be on hand at the beginning of the first quarter? **(10 Marks)**

6 a. Define ABC analysis, EOQ, ordering cycle. **(06 Marks)**

b. Calculate the economic lot size with uniform rate of demand and instantaneous replacement. Give total costs and total annual costs. **(06 Marks)**

c. A stockiest has to supply 800 units per week of a product to his customers. He gets the product at RS.75 per unit from the manufacturer. The cost of ordering and transportation from the manufacturer is Rs.100 per order. The cost of carrying is 10% per year of the cost of the product. Calculate the economic lot size, time to produce the economic lot size and total optimum cost per week. **(08 Marks)**

7 a. What is MRP and give the inputs required? **(04 Marks)**

b. What is ERP? **(04 Marks)**

c. A work centre operates 6 days a week on a two shifts per day basis (8 hours per shift). It has four machines with the same capacity. If the machines are utilized 75% of the time at a system efficiency of 90%, what is the rated output in standard hours per week? **(06 Marks)**

d. Given the structure tree shown, compute the net requirements of A, B, C, D, E, F to produce 10 units of end item X. No stock is on hand. **(06 Marks)**

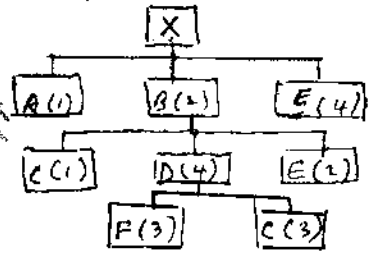

Fig.Q.7(d)

8 a. Explain the importance of purchase and supply management. **(06 Marks)**

b. Explain the concept of tenders and logistics management. **(06 Marks)**

c. Micro-Brush requires a new component for their laptop cleaning machines. The company must decide whether to make or buy them. If it decides to make them, should it use process A or process B? Use a Break-Even analysis to advise them if the following data is given:

	Make A	Make B	Buy
Annual volume	10,000	10,000	10,000
Fixed cost/year	Rs.150,000	Rs.2,00,000	
Variable cost/unit	Rs.100	Rs.50	Rs.200

i) Should Micro make using process A or B or buy?

ii) At what annual volumes should Micro switch from each make/buy decision to the other? **(08 Marks)**

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10ME/PM81

Eighth Semester B.E. Degree Examination, June/July 2016
Operations Management

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

PART – A

1 a. Define operation management. Draw the operations management system showing input and output model for an international airport. **(06 Marks)**

b. Briefly explain how service producers differ from goods producers in important aspects of their operations. **(06 Marks)**

c. With neat schematic sketch, explain the frame work for managing operations. **(08 Marks)**

2 a. Define decision making. Explain the frame work for decision making. **(06 Marks)**

b. Two assembly robots X and Y working at the same rate together produce 400 filters per day. During a recent day, 40 filters were found defective. given that the filter is defective, there is 0.40 probability it was produced by robot X (i.e., $P_{X/D} = 0.40$). What is the probability that a filter selected at random is : i) Defective ii) Produced by robot Y iii) Defective and produced by robot X iv) Defective or produced by robot X. **(04 Marks)**

c. Define BEP. Briefly explain the various methods of lowering the breakeven point. **(10 Marks)**

3 a. Briefly explain the following : i) Time series forecasting ii) Forecasting error and tracking signal. **(10 Marks)**

b. The following table gives the annual shipment (tons) of welded tube by an aluminum producer to machinery manufacturers :

Year	2004	05	06	07	08	09	10	11	12	13	2014
Shipment (tons)	2	3	6	10	8	7	12	14	14	18	19

Use the least square method to develop a linear trend equation for the data given, state the equation and forecast the shipment for 2015. **(10 Marks)**

4 a. Define capacity planning. Explain long-terms and short-term capacity strategies. **(05 Marks)**

b. The individual component capacities (in units/day) for an assembly line that consists of five activities are shown in the figure below Fig. Q4(b). **(05 Marks)**

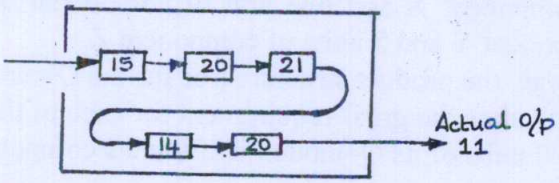

Fig. Q4(b)

i) What is the system capacity?

ii) What is the efficiency of the system?

c. Annual demand for a manufacturing organization capacity is expected to be as follow :

Unit demanded	8000	10000	15000	20000
Probability	0.5	0.2	0.2	0.1

Revenues are ₹35/unit. The existing manufacturing facility has annual fixed cost/operation are ₹2 lakhs. Variable manufacturing cost are ₹7.75/unit, ₹5/unit, ₹5.33/unit & ₹7.42/unit at the 8000, 10000, 15000 and 20000 unit output level respectively. An expanded facility under consideration would require ₹2,50,000 fixed operating cost annually. Variable cost are ₹9.4/unit, ₹5.2/unit, ₹3.8/unit and ₹4.9/unit at the 8000, 10000, 15000, 20000 unit output level receptively. In order to maximize the earnings which size facility should be selected? **(10 Marks)**

PART – B

5 a. List and explain the aggregating planning strategies. (06 Marks)

b. Demand forecast for a non automatic washing machine is given in the following table for three periods.

Period	Demand forecast	Limits on sources of capacity		
		Regular	Overtime	Subcontract
1	600	975	225	150
2	1050	975	225	150
3	1600	975	225	150

Initial inventory = 0
Ending inventory = 200
Unit production cost (regular) = ₹ 5000/-
Overtime production cost/unit = ₹ 8000
Subcontracting cost/unit = ₹ 12000/-
Back ordering cost = ₹ 400/unit/period
Inventory carrying cost = ₹ 100/unit/period

Formulate the aggregate planning problem by transportation method. (14 Marks)

6 a. Define inventory. Enlist the various reasons for maintaining inventories. (06 Marks)

b. Enlist the characteristics of manufacturing model with no shortages. (04 Marks)

c. A company purchases 9000 parts of a machine for its annual requirement, ordering one month's usage at a time. Each part cost ₹ 20/-. The ordering cost per order is ₹ 15/- and the carrying charges are 15% of the average inventory per year. Determine the economical purchasing policy for the company. What advice would you offer and how much would it save the company per year? (10 Marks)

7 a. Define MRP. Explain the fundamental concepts of MRP. (07 Marks)

b. Briefly explain MRP – II. (07 Marks)

c. A company makes Q model from components R, S and T component R is made from 2 units of component X and one unit of component Y. Component T is made from one unit of component Y and 3 units of component Z.

i) Draw the product structure tree for the Q–model

ii) Calculate the gross requirement for each of the components if the company plans to build 100 units of its Q–model, if 150 units component T and 200 units of component R in inventories. (06 Marks)

8 a. Define supply chain. Explain the components of supply chain in detail. (08 Marks)

b. With neat block diagram, explain the various activities of company and supplier. (08 Marks)

c. Bull whip effect in supply chains. Explain. (04 Marks)

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10ME81

Eighth Semester B.E. Degree Examination, June/July 2017

Operations Management

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. Define operations management. Give a brief account of the historical evolution of operation management. **(08 Marks)**

b. Differentiate between product and services. **(06 Marks)**

c. State the factors affecting productivity. **(06 Marks)**

2 a. Briefly explain the various characteristics of decision making. **(05 Marks)**

b. Explain the framework for decision making. **(07 Marks)**

c. The following figures shows profit and sales of XYZ company:

Year	Sales (Rs)	Profit (Rs)
2014	25,000	3,000
2015	35,000	4,500

Calculate: i) Fixed cost ii) P/V ratio,
iii) BEP iv) Sales to earn a profit of Rs.6000. **(08 Marks)**

3 a. State and explain various factors affecting forecasting. **(06 Marks)**

b. State various time series methods of forecasting. Explain:
i) simple moving average
ii) weighted moving average. **(08 Marks)**

c. Demand for a TV sets in Mumbai showrooms was 400 in 1st quarter, 350 in 2nd quarter and 250 in 3rd quarter.
i) What is the forecast for the 4th quarter by simple average method?
ii) What is the forecast for 4th quarter by WMA, given weightage for the most recent part period double than the other previous two period? **(06 Marks)**

4 a. Explain:
i) Design capacity
ii) System capacity. **(06 Marks)**

b. List the various factors influencing plant location. Explain. **(06 Marks)**

c. A firm developing agency must determine how many photo enlarger cubicles are required to maintain in output of 200 goods per hour. The set up and explosure time can theoretically be done on 2 minutes per print, but operators are on the average only 90 percent efficient and in addition 5 percent of print scrapped and redone. Also the cubicles can utilized for enlarging only 70 percent of the time.
i) What is the required system capacity in prints/hr?
ii) What average output/hr can be expected from each cubicles taking its use factor and efficiency into account?
iii) How many enlarger cubicles are required? **(08 Marks)**

PART – B

5 a. Explain various aggregate planning cost. **(06 Marks)**

b. Distinguish between aggregate planning and master scheduling with an example. **(04 Marks)**

c. Vertex Inc. produces machines that have a seasonal demand pattern, we are required to plan the optimum production rates and inventory levels for the next four quarter periods. The available production capacities during regular time (RT), over time (OT) as well as other cost data are as follows:

Supply capacities (units)			
Period	RT	OT	SC
1	1200	150	800
2	900	200	800
3	1000	350	800
4	700	350	800

Demand & Inventory	
Period	Units
1	1200
2	900
3	1000
4	700

i) Initial inventory = 110 units ii) Final inventory = 140

iii) Regular time cost/unit = Rs.100 iv) Overtime cost/unit = Rs.125

v) Sub contracting cost/unit = Rs.145 vi) Cost of unused capacity = Rs.40/unit

vii) Inventory cost per unit/period = Rs.15

Determine optimum production and total cost. **(10 Marks)**

6 a. Discuss the need for inventory. **(06 Marks)**

b. Explain the various cost associated with inventory. **(06 Marks)**

c. A company estimates that it will sell 12000 units of its product for the next year. The ordering cost is Rs.100/order and the carrying cost per unit per year is 20% of the purchase price per unit. The purchase per unit s Rs.50. Find:

i) Number of orders per year

ii) EOQ

iii) Time between successive orders. **(08 Marks)**

7 a. Discuss various MRP inputs and outputs. **(10 Marks)**

b. With the given product structure tree and inventory, compute the net requirements for A, B. C, D and E to produce 50 units of X.

Components	A	B	C	D	E
Inventory on hand & on order	20	10	15	30	100

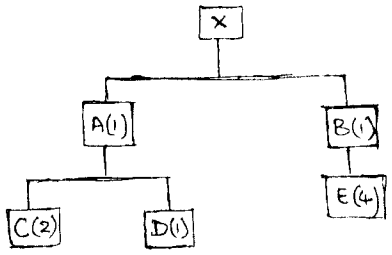

Fig.Q7(b) **(10 Marks)**

8 a. State the importance of purchasing and supply management. **(06 Marks)**

b. Explain the procurement process. **(06 Marks)**

c. Explain stages of vendor development. **(08 Marks)**

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10ME/PM81

Eighth Semester B.E. Degree Examination, Dec.2014/Jan.2015

Operations Management

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. What are the differences between production (mfg) and service operations? **(06 Marks)**

b. Classify types of production system and explain job shop production system. **(06 Marks)**

c. A manufacturing concern was producing 120 locomotives per year by employing 20,000 men in the past. To increase production they have now recruited 1000 men more and as a result production has increased to 140 locomotives per year. Find:

i) What was the labour productivity previously?

ii) What is the labour productivity now?

iii) What is the percentage increase in production and productivity? **(08 Marks)**

2 a. List the basic categories of decision environment and briefly explain. **(10 Marks)**

b. Suppose that the values in the pay off table represent costs:

	New bridge	No New Bridge
A	1	14
B	2	10
C	4	06

Alternative capacity for new store

Determine the choice that you would make under each of these strategies: maximin, Laplace and minimax regret. **(10 Marks)**

3 a. What are the features of forecast? **(05 Marks)**

b. List the elements of a good forecasting technique. **(05 Marks)**

c. Demand for Squda rapid car in Bangalore showroom was 200 in I quarter, 50 in II quarter and 150 in III quarter:

i) What is the forecast for the IV quarter by simple average method?

ii) What is the forecast for the IV quarter by WMA, given the weightage for the most recent past period is double than the other previous two periods? **(10 Marks)**

4 a. List and explain the factors affecting the capacity. **(05 Marks)**

b. With suitable example, explain product type layout. **(05 Marks)**

c. A firm is considering 4 alternative locations for a new plant. An attempt was made to study all costs at various locations and finds that the production costs of the following items vary from one location to another. The firm will finance the new plant in the form of bonds with 10% interest. Determine the most suitable location for the output volume in the range of 350000 to 130000.

Sl. No.	Particulars	A	B	C	D
01	Labour cost/unit	0.75	1.1	0.8	0.9
02	Plant construction cost $\times 10^6$	4.6	3.9	4.0	4.8
03	Material and equipment cost/unit	0.43	0.6	0.4	0.55
04	Electricity/yr	30,000	20,000	30,000	20,000
05	Water/Yr	7000	6000	7000	7000
06	Transportation cost/unit	0.02	0.1	0.1	0.05
07	Taxes/Yr in Rs.1000	33	28	63	35

(10 Marks)

PART – B

5 a. List and explain pure strategies used in aggregate planning. **(05 Marks)**

b. Explain "Master production schedule". **(05 Marks)**

c. A manufacturing company currently has labour force of 10 which can produce 500 units per month. The cost of labour is Rs.2000(month/labour). The company has a long standing rule which does not allow OT and some subcontract. As a result, the company can only increase or decrease production by hiring or laying off the employees within 10 of existing size. The cost of hiring of an employee is Rs.5000 and layoff cost is twice as that of hiring including benefits and severance costs. Inr carrying costs are Rs.100/unit remaining at the end of each month. The Inr level at the beginning of Jan is 300 units. The forecasted aggregate demand for next 6 months are as follows:

Month	Jan	Feb	Mar	Apr	May	June
Aggregate units demand	630	520	410	270	410	520

Note: Never have a stock-out situation. No backorder.

Compare costs for: i) level workforce strategy, ii) Chase demand (hire and fire), iii) Compare both strategies and comment. **(10 Marks)**

6 a. Explain the types of inventory. **(04 Marks)**

b. Explain ABC classification system. **(06 Marks)**

c. Determine the optimum order quantity for a component for which the cost breaks are as follows:

Quantity	Unit Cost (Rs)
$0 \le Q_1 \le 500$	C_1
$500 \le Q_2$	C_2

The monthly demand for the component is 200 units. The cost of storage is 2% of the cost. Cost of ordering is Rs.350.

i) Find the optimum order size.

ii) If the order cost is changed to Rs.100 per order, find the optimum order size. **(10 Marks)**

7 a. Define MRP and with a block diagram, explain the various I/Ps to an MRP system. **(10 Marks)**

b. A manufacturer has the following information on major product:

R.T. production capacity = 2600 unit/period

O.T production cost = Rs.12/unit

Inventory cost = Rs.2/ unit period

Backlog cost = Rs.5/unit period

Demand in units for periods 1, 2, 3 and 4 are 4000, 3200, 2000 and 2800 respectively. Assuming unlimited O.T. capacity, develop a level output plan that yields zero inventory at the end of 4th period. What cost result from the plan? **(10 Marks)**

8 a. Explain steps to create an effective supply chain management. **(05 Marks)**

b. What is reverse logistic and why is this important for retail firm? **(05 Marks)**

c. Describe vender analysis. **(05 Marks)**

d. Describe CPFR. **(05 Marks)**

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10ME/PM81

Eighth Semester B.E. Degree Examination, Dec.2015/Jan.2016

Operations Management

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. Define production operation management. How to classify production system? Explain any one with example. **(10 Marks)**

b. What are factors affecting productivity? **(05 Marks)**

c. What are the objectives of production management? **(05 Marks)**

2 a. Explain the following :
i) Decision support system ii) Characteristics of decision iii) Management is science **(09 Marks)**

b. Outline and explain the steps in decision making process. **(06 Marks)**

c. What are the decisions making environments? Explain briefly. **(05 Marks)**

3 a. What is a Forecasting? Why are forecasts important to organization? What are features? **(05Marks)**

b. Mention the forecasting procedure for using time series method. **(05 Marks)**

c. The table below gives a sales record of a firm. Determine the regression line for the firm and find the forecast of sales in the month of January for next year **(10 Marks)**

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
90	111	99	89	87	84	104	102	95	114	103	113

4 a. Define capacity and capacity planning. **(05 Marks)**

b. Explain long term capacity strategies. **(05 Marks)**

c. A company has six production areas as shown in the facility outline, it proposes to locate six departments (A, B, C, D, E, F) which have the number of moves per day between departments as shown in the travelling chart. Develop a layout of six departments of graphic approaches, which minimize the non adjacent flows

1	2	3
4	5	6

Facility outline layout

To / From	A	B	C	D	E	F
A	-	7	-	-	-	5
B	-	-	-	4	10	-
C	-	7	-	-	2	-
D	-	-	8	-	-	-
E	4	-	-	-	-	3
F	-	6	-	10	-	-

Travel chart

(10 Marks)

PART – B

5 a. What is aggregating planning? What are the objectives of aggregating planning? **(08 Marks)**

b. The supply, demand, cost and inventory data for a company which has constant workforce is given below.

Demand Forecast	
Period	demand
1	100
2	50
3	70
4	80

Initial inventory = 20
Final inventory = 25

Supply Capacity (Units)			
Period	Regular time	Over time	subcontract
1	60	18	1000
2	50	15	1000
3	60	18	1000
4	65	20	1000

Total cost / Unit (Regular time) = ₹ 100, overtime cost / unit = ₹ 125
Sub concrete cost/unit = ₹ 130
Carrying cost unit/period = ₹ 52
Using transportation. **(12 Marks)**

6 a. What is inventory? Why is inventory management required in organization? What are the lines of inventory? **(08 Marks)**

b. Trinity Hospital at Bangalore sources 20,000 disposable syringes every year, from supplier. The ordering cost per period is ₹ 100 and we carrying cost is ₹ 1 per unit per year. The price of a springs ₹ 5, The supplier offers a 5% discount if purchases are made in loss of 10,000 syringes or more. Determine whether the discount model better than EOQ model in this situation. **(12 Marks)**

7 a. What are the three inputs for an MRP system? Briefly explain them. **(08 Marks)**

b. A firm producing wheel barrows is expected to deliver 40 wheel barrows in week, 60 in week if 60 in week 61, and 50 in week. Among the requirements for each wheel barrow are two handle bars, a wheel assembly and are for wheel assembly. The following table shows BOM and inventory data for wheel barrow components

Part	Order	Lead times	Inventory on hand
Handle bars	300	2week	100
Wheel assemblies	200	3 week	220
Tyres	400	1 week	50

90 wheel assemblies are also required in week 5 for a garden shipment A shipment of 300 handles bars is already scheduled to be received at the beginning of the week 2. Compute the MRP for the handle bars, wheel assemblies and tyres. Show that, quantities or order must be released and when they must be released to satisfy the master schedule? **(12 Marks)**

8 a. What is the importance of purchasing and supply management in operation managements? List the function of purchase department. **(08 Marks)**

b. What do you mean by make or buy decision? How do you assess the above decision through the BEP chart? **(06 Marks)**

c. Define vendor rating. Explain steps involved in vendor rating. **(06 Marks)**

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10ME/PM81

Eighth Semester B.E. Degree Examination, Dec.2016/Jan.2017
Operations Management

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. Explain with schematic model the main functions of business organization and role of operations management. **(05 Marks)**

b. Distinguish between manufacturing and service organization. **(05 Marks)**

c. Classify production systems and explain with examples. **(05 Marks)**

d. Define productivity. What are the factors affecting productivity? **(05 Marks)**

2 a. Explain steps in decision making process. **(06 Marks)**

b. Jindal steels limited is planning to start a new factory for manufacturing steel utensils. It is considering three location options namely. Bangalore, Shimoga and Bellary. The fixed cost at these locations have been estimated at ₹ 81,50,000, ₹ 73,77,000 and ₹ 79,03,000 respectively. The variable cost at the three locations are estimated at ₹ 500 per unit, ₹ 580 per unit and ₹ 490 per unit respectively. The factory will have an annual production capacity of 10,000 steel utensils and in the initial years it will operate at 75% efficiency. Find the best location option, which has the lowest total cost of production. **(06 Marks)**

c. The values of a pay-off table are:

	New Bridge	No New Bridge
A	1	14
B	2	10
C	4	6

Determine the choice to make under maximin and Laplace strategies. **(08 Marks)**

3 a. What is forecasting? List the steps involved in forecasting process. **(05 Marks)**

b. List the elements of good forecasting technique. **(05 Marks)**

c. A car manufacturing firm finds a relation of sales of car and index of demand for a car. Sales for the past five years are given in the table below. Find the relation between the demand index and sale of car by least square of linear regression. Further make a forecast for the sixth year assuming the index of demand is 210. **(10 Marks)**

Year	1	2	3	4	5
Sales	110	130	150	160	180
Demand index	100	110	140	150	200

4 a. What are the determinants of capacity? **(04 Marks)**

b. Explain various factors that influence the location of the plants. **(05 Marks)**

c. What is facility layout? Sketch and explain product and process layout. **(05 Marks)**

d. ISRO is considering expansion of the existing facility by adding 1 ton capacity of curing furnace for manufacturing solid propellant. Each batch of 1 ton propellant must undergo 30 minutes of furnace time, including loading and unloading operations. Due to power restrictions, furnace is used only 80 percent of time. In a shift of 8 hours the required output is to be 16 tons. If the plant system estimated is 40% of system capacity determine the number of furnaces required. **(06 Marks)**

PART – B

5 a. What is aggregate planning? Explain the different strategies in aggregate planning. **(05 Marks)**

b. State functions of master process schedule. **(05 Marks)**

c. A firm has developed the following demand forecast in units for an item which is influenced by seasonal factor.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Forecast Demand	270	220	470	670	450	270	200	370

Suppose the firm estimates that it costs ₹ 150/- per unit to increase the production rate, ₹ 200 per unit to decrease the production rate by changing work force and ₹ 100/- per unit if subcontracted. Compare the cost incurred if both pure strategies are followed. **(10 Marks)**

6 a. Define inventory. Enumerate the various reasons for maintaining inventory. **(05 Marks)**

b. Explain briefly ABC classification in inventory control. **(05 Marks)**

c. A manufacturing company buys a component from a vendor. The component costs ₹ 2.50 per unit and it takes ₹ 40/- to place an order. Its inventory carrying charge is 18% of the average inventory. The company currently purchases ₹ 25000/- worth of these components:

i) What is the EOQ?

ii) What is the optimum number of orders per year to minimize the company's cost?

iii) What is the total optimal duration between each order?

iv) What is the total annual inventory cost including materials? **(10 Marks)**

7 a. Define MRP. What are the main inputs and outputs of MRP? **(06 Marks)**

b. Briefly explain:

i) MRP – II ii) ERP **(06 Marks)**

c. Forecast demand for a firm is 400 units in 4^{th} week and 500 units in 8^{th} week. The firm has on hand inventory of 50 units including safety stocks and scheduled to receive 350 units in week 4 and 500 units in week 8. Estimate further orders to be placed by the firm. **(08 Marks)**

8 a. What is the importance of purchasing and supply chain management in operations management? **(08 Marks)**

b. Briefly explain:

i) Make or buy decision

ii) Vendor development.

iii) E procurement

iv) Concept of Tenders. **(12 Marks)**

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