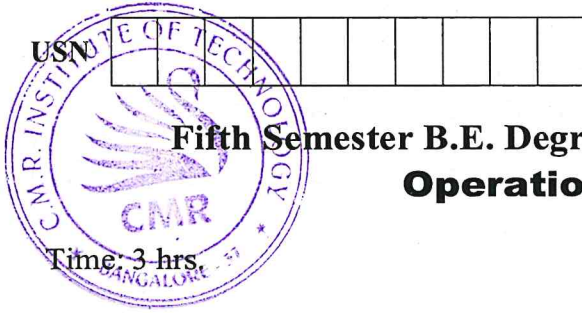


# CBCS SCHEME

18ME56



## Fifth Semester B.E. Degree Examination, July/August 2021 Operations Management

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions.*

- 1 a. What do you understand by the term Operations Management? Trace the historical events leading to study of operation management. (07 Marks)
- b. Explain productivity. State the factors affecting productivity. (05 Marks)
- c. A company has an order for a particular component is 100,000 units. There are two alternate methods to manufacture the product. The details of various costs are given below:

Investment details	A	B
(i) Investment on Machinery & Building	Rs.60,00,000	Rs.80,00,000
(ii) Other Fixed & production overheads	Rs.3,00,000	Rs.2,00,000
(iii) Variable production cost/unit	Rs.125	Rs.115
(iv) Variable selling expenses/unit	Rs.5	Rs.15
Selling price/unit	Rs.280	

- (i) Which alternative is economical?
- (ii) Estimate the loss of selecting wrong alternative. (08 Marks)
- 2 a. Explain the concept of production system with a schematic diagram. (07 Marks)
- b. Sketch and explain the BEP analysis. Explain how it helps in decision analysis. (05 Marks)
- c. A milk factory seeks advice concerning its business and production processes. The final report describes several steps to increase productivity. Accordingly following are the details:

	Existing system	Proposed system
Milk output/hour	1000 gallons	1400 gallons
Wage rate/hour	Rs.12	Rs.12
Filtration cost/hour	Rs.120	Rs.170
Workers	12	9

- (i) Calculate labor productivity for both systems.
- (ii) Find All Factor (AFP) for both systems. (08 Marks)
- 3 a. What Forecasting? Explain any two techniques. (07 Marks)
- b. Explain any two Forecast Errors. (05 Marks)
- c. The manager of a road transport company believes that the demand for tyres used on his trucks is closely related to the number of kilometers driven. Accordingly the following data covering past 7 months collected.

Duration	1	2	3	4	5	6	7
Kms driven in 1000	120	135	130	150	170	190	220
No. of tyres used	9.5	11.0	12.0	12.5	14.0	16.0	18.0

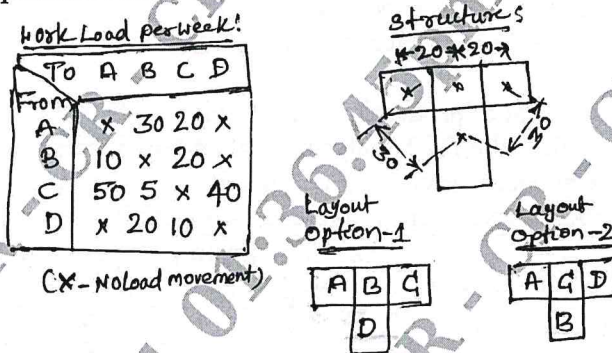
- (i) Compute the coefficients a and b for the regression line.
- (ii) Suppose the manager plans to drive 250000 kms, what is the expected number of tyres which will be used? (08 Marks)

- 4 a. What is coefficient of correlation? Explain tracking signal with a graph. (06 Marks)  
 b. What are the Time Series Components? Explain the processing steps in forecasting and limitations. (06 Marks)  
 c. Explain the difference between MA and EMA. Find the Weighted Moving Average of 3 and 5 months.

Months	Jan	Feb	Mar	Apr	May	Jun	Jul
Bottles	1325	1353	1305	1275	1210	1195	?

(08 Marks)

- 5 a. What are the various types of capacity? Explain the importance of capacity planning. (06 Marks)  
 b. Explain any two types of layout. (06 Marks)  
 c. A metal processing firm wishes to install enough automobile molders to produce 250000 good castings per year. The molding operations takes 1.5 minutes per casting, but output is typically about 3% defective. How many molders will be required if each one is available for 2000 hours (of capacity) per year? (08 Marks)
- 6 a. List the various factors influencing plant location. Explain. (06 Marks)  
 b. Explain the various capacity measures. What are the capacity strategies? (06 Marks)  
 c. In a small factory two alternate layouts are to handle the following work load/week. Find the suitable option and optimum cost. (08 Marks)



- 7 a. What is Aggregate Planning? Explain its strategies. (06 Marks)  
 b. What are the Functions of Master Production Schedule? State the difference between AP and MPS. (06 Marks)  
 c. A manufacturing plant is in the process of updating its MPS for its products. The plant produces a product on a produce-to-stock basis. Table below shows the estimates of demand for the product for the next six weeks.

Types of Demand	Week					
	1	2	3	4	5	6
Customer forecast & orders	700	1200	700	500	400	1200
Warehouses	100	100	400	500	200	100
Market Research	-	50	-	-	10	-
Production Research	10	-	-	-	-	-

CMRIT LIBRARY  
BANGALORE - 560 037

The plant starts with Beginning Inventory of 1500 units, the safety stock requirement of each week is 500 units and the minimum production. Lot size is 2000 units. Prepare a six week detailed master production schedule. Also Available-To-Promise for next 7<sup>th</sup> week.

(08 Marks)

- 8 a. Explain the Master Production Schedule with a diagram. (06 Marks)  
 b. What are the objectives and strategies of MPS? (06 Marks)  
 c. Given the following information, set the aggregate planning problem as a transportation problem and find the solution using least cost method.  
 Forecast demand and production capacity:

Period	Available capacity units			Demand Forecast units
	RT	OT	SG	
1	500	50	120	520
2	500	50	120	720
3	500	50	100	750

Initial Inventory = 100 units, Final Inventory = 100 units, Inventory Carrying Cost = Rs.1/unit/period. Back ordering is not permitted. (08 Marks)

CMRIT LIBRARY  
BANGALORE - 560 037

- 9 a. What are the objectives of MRP? Explain the input and outputs of MRP package. (06 Marks)  
 b. Explain the key features of MRP system. (06 Marks)  
 c. A company makes Q model from components R, S and T. Component R is made from 2 units of component X and 1 unit of component Y. Component T is made from 1 unit of component Y and 3 units of component Z.  
 (i) Draw the product structure tree for Q.  
 (ii) Actually company plans to build 100 units of Q, and having inventory of 150 units of T and 200 units of R. Find the gross and net requirements of T, R and S. (08 Marks)
- 10 a. Define supply chain. What are the key decisions in supply chain? (06 Marks)  
 b. Explain a typical supply chain system with a blank diagram. (08 Marks)  
 c. Explain Bullwhip effect. What are the root causes for bullwhip effect? (06 Marks)

\*\*\*\*\*

