Model Question Paper-2with effect from 2022-23 (CBCS Scheme)

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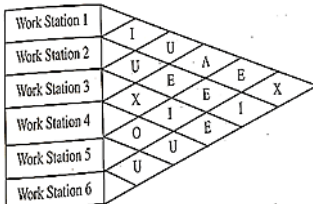## Sixth Semester B.E. Degree Examination
Subject Title: Production and Operations Management

TIME: 03 Hours   Max. Marks: 100

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each
MODULE.

02.   Each question Carry equal marks

		Module -1	**Marks**	**Bloom's Taxonomy Level**	**COs**
Q.01	**a**	Explain the operations management system with possible inputs, outputs and transformation process for a district hospital.	**10**	**L2**	**CO1**
	b	Define productivity**.** Discuss the factors affecting productivity.	**10**	**L2**	**CO1**
		OR			
Q.02	**a**	Define BEP, Margin of safety, Contribution, Angle of incidence.	**8**	**L2**	**CO1**

	b	A firm has a rated capacity of manufacturing 30000 castings/years. But due to poor sales, it is working at 25% of its rated capacity. The expenses are as below:
		 Fixed production expenses: 270000 Rs
		 Direct material cost: 62000 Rs
		 Variable production expenses: 80300 Rs
		 Direct labour cost: 52200 Rs
		 Fixed sales expenses:30000 Rs
		 Variable sales expenses:15000Rs
		  i. Determine BEP when each unit is sold at rate of Rs 55/-
		  ii. If it is possible to increase the sales to 24000 units /year and selling price reduced to Rs. 40/ unit, what would be the present profit or loss? Compare this with the profit or loss in the above case.
		  iii. What is the new BEP?
			12	**L3**	**CO1**

		Module-2			

Q.03	**a**	The Manager of a road transport company believes that the demand for the tyres used on his trucks is closely related to the number of kms driven, Accordingly following data covering the past six months has been collected:
		
		 (table below)
		
		  1. Compute the coefficients a and b for the regression line
		  2. Suppose the manger plans to drive 140,000 kms, what is the expected number of tyres that will be used?
		  3. What percentage of Variation in types use can be explained by kms driven?
			12	**L3**	**CO2**

Month	1	2	3	4	5	6
Kms driven in 1000s	150	200	170	110	120	270
Number of tyres used	10	15	12	8	9	18

	b	Explain the following qualitative forecasting methods
		  i. Delphi
		  ii. Executive opinion methods
			8	L2	CO2

		OR			
Q.04	a	Using simple exponential smoothing technique, determine the forecast for period 2 through 12 for which the actual figures are given below. Assume that for the 1st period forecast is equal to actual demand in that period given α=0.2. Also Graphically compare your forecast demand with actual demand.	12	L3	CO2

Period	1	2	3	4	5	6	7	8	9	10	11	12
Demand	200	211	190	198	210	230	195	200	215	198	200	212

	b	Define forecasting and explain the steps involved in forecasting process.	8	L2	CO2
		Module-3			
Q.05	a	What is Capacity planning? Explain long term and short-term capacity strategies.	10	L2	CO3
	b	Explain the steps involved in capacity planning.	10	L2	CO3
		OR			
Q.06	a	Discuss the factors that determine the type of layout in a plant.	7	L2	CO3
	b	Given the following relationship chart, arrange the work stations into a suitable 2 ×3 grid 	6	L3	CO3
	c	Define plant layout. Explain the main objectives of good plant layout.	7	L2	CO3
		Module-4			
Q.07	a	Define the Aggregate planning. Explain the aggregate planning process.	10	L2	CO4
	b	A company produces a motor assembly that is used in several hand appliances. It has 60units in stock and will manufacture more in production run (lots) of 90 units. Develop a tentative Master schedule for the demand shown in the table below:	10	L3	CO4

Initial Inventory=60	Weeks									
	1	2	3	4	5	6	7	8	9	10
Customer forecast	-	5	30	40	50	40	50	50	50	50
Interplant forecast	-	-	5	-	-	5	-	-	5	-
Customer order	40	40	30	10	10	5	-	-	-	-
Warehouse orders	15	10	-	5	-	-	-	-	-	-

		OR			
Q.08	a	With flow chart, explain master production scheduling process.	8	L2	CO4
	b	A car manufacturing company has supply capacity, demand and inventory	12	L3	CO4

pattern shown in the table below:

Supply units

Period	RT	OT	SC
1	60	18	1000
2	50	15	1000
3	60	18	1000
4	65	20	1000

Demand

Period	Units
1	100
2	50
3	70
4	80

Inventory: Initial =20; Final =25

(RT)Regular Time Cost/ unit= 100 Rs of which 50% of cost is labour

(OT)Over Time Cost/unit=125 Rs; (SC)Sub Contact Cost /unit= 130 Rs;

Inventory carrying cost/ unit=2 Rs.

Formulate this problem as transportation model to determine optimum production levels and means of production for the next four quarter periods. The company has a constant workforce and wishes to meet all demand with no back orders. Allocate production capacity to satisfy demand at minimum cost.

		Module-5			
Q. 09	a	A firm has forecast demand rate averaging 10 units /week for an item A. It produces A in order quantities of 40 units during 1-week lead time and carries a safety stock of 15units. The firm has on hand inventory of 20units (includes safety stock) and is scheduled to receive 40 units during week one. Prepare MRP schedule for 12-week period with the details given.	10	L3	CO5
	b	What is MRP? With flow chart, discuss inputs to and outputs from MRP system.	10	L2	CO5
		OR			
Q. 10	a	Design product structure and Intended BOM for a bracket (Z100) that is made up of brass (A10), 2 springs (B11) and 4 clamps (C20). The base is assembled from one clamp (C20) and two housing (D21). Each clamp has one handle (E30) and each housing has two bearings (F31) and one shaft (G32).	10	L3	CO5
	b	Explain stages of vendor development.	10	L2	CO5