Course Name: Manufacturing Resource Planning & Control		Course Code		MMS - O-307
Roll No.		Marks		**60**
Total No. of Questions	6	Duration		**3 Hours**
Total No. of printed pages	4	Date		13.02.2023

Course Outcome Statements:

CO1: Remember the basic concepts of production and operations management.

CO2: Understand various resources required for a manufacturing organization.

CO3: Apply the principle of matching available supply with market demand

CO4: Analyse Sales and marketing plan to prepare Aggregate production Plan

CO5: Assess the feasibility of meeting the draft Master Production Schedule

Instructions: -			Marks		CO
Q. No 1 (All Questions are Compulsory)					
Q. No.		Questions			
Q. 1		Case/Case-let Study (500-800 words)			
	a.	A manufacturer of an industrial equipment is in the process of preparing the Aggregate Production Plan for the next year. He feels he has sufficient manufacturing capacity in terms of labour hours per month available. The details of his operations are – a. Currently he works on a single shift basis of 8 working hours and employs 125 workers. b. Time required to manufacture one unit of equipment is 100 hours c. At the beginning of the new financial year he will have finished goods inventory of 200 units. d. Inventory carrying costs are Rs. 1000 per unit per month and are applied on the average inventory held during the month e. The shortage or backlogging costs for overdue orders are double the unit carrying cost. The table below gives the forecast demand for his equipment and the number of working days available during the planning horizon.	6	4	4

Month	Demand (in units)	Number of working days
April	250	23
May	220	22
June	300	21
July	290	24
August	260	22
September	180	22
October	200	19
November	220	23
December	250	21
January	200	23

		February	240	20			
		March	270	24			
		If he follows level production strategy with given workforce, can he meet demand? Estimate the cost of the plan.					
	b.	If the manufacturer in the above example has no opening stock and desires to follow a chase strategy by overtime working, Estimate the cost of the plan. The overtime cost for worker is Rs. 40 /hour and the undertime cost (nuisance due to idle worker) is Rs. 20/hour.	6	5	5
Q. 2		Answer **Any one** from the following.			
	a.	Explain level production strategy with its characteristic. Evaluate its production system and compare it with Chase demand strategy?	6	5	5
	b.	A company manufactures three products A, B and C, each unit of which requires 20, 40 and 70 man hours respectively to produce. Following table gives data about the forecast and firm orders for these products for a planning horizon of next three months. Capacity planned in A.P. Plan is 18000 hrs/ month which is just available in the current situation in factory. Evaluate a MPS for the period covered in planning horizon and comment on the capacity required to execute the plan. State clearly the assumptions made for drawing the schedule	6	5	5

Product	Demand Status	Month1	Month2	Month3
A	Forecast	100	120	140
	Firm order	120	90	30
B	Forecast	200	240	180
	Firm order	180	200	60
C	Forecast	80	100	90
	Firm order	50	110	20

Q. 3		Answer **Any one** from the following.			
	a.	List down the importance of Assembly line. List the features of current ERP packages available today.	6	4	4
	b.	The following tasks are required to be performed on an assembly line in the sequence and times specified.	6	4	4

Task	Task time (seconds)	Tasks that must precede
A	50	-
B	40	-
C	20	A
D	45	C
E	20	C
F	25	D

G	10	E	
H	35	B, F, G	

a. Draw the schematic diagram.

b. Find out the theoretical minimum number of stations required to meet a forecast demand of 400 units per eight hours of actual working shift

c. State the idle time for each station after balancing the line

d. Ascertain the efficiency of the assembly line.

Q. 4		Answer **Any two** from the following.			
	a.	An engineering company has installed a machine to manufacture its product. Its Design capacity is 1000 units / month while the Effective capacity is 800 units /month. Actual output obtained in a particular month was 720 units. Utilize the above case to identify the following terms : i) Capacity Utilization ii) Efficiency Number of units required to be produced, if capacity utilization to be 75%.	6	3	3
	b.	A bakery has following demand pattern for first four days of the week	6	3	3

Day	4 weeks ago	3 weeks ago	2 weeks ago	Last week
Monday	2200	2400	2300	2400
Tuesday	2000	2100	2200	2200
Wednesday	2300	2400	2300	2500
Thursday	1800	1900	1800	2000

1. Find out likely demand for following days of the next week by different methods
   a. Monday by four week moving average method
   b. Tuesday by weighted average method by using weights .40, .30, .20, .10 (higher weight for near past and lower ones for distant past)

2. If the forecast for entire last week's demand was 22,000 but only 21, 000 were actually demanded , estimate the forecast for the entire next week by using exponential smoothing constant of .10

3. Based on the forecast made in (2) above for the next week, if the actual demand in the next week turns out to be 22,500,

		what will be the forecast for week after that?			
	c.	"Aggregate Production Plan is chalked out to meet demand by balancing supply on period by period basis". Utilize the above statement by bringing out commonly used demand modifiers as well as different supply altering techniques.	6	3	3
Q. 5		Answer **Any two** from the following.			
	a.	Explain scheduling explain its important in manufacturing organization. Illustrate the characteristic features of the two main work scheduling or loading methods and their underlying assumptions.	6	2	2
	b.	Classify different ways for expressing capacity? How are they related? Explain the terms capacity utilization and capacity management?	6	2	2
	c.	Explain Master Production Schedule (MPS)?	6	2	2
Q. 6		Answer **Any two** from the following.			
	a.	What is a cellular layout? What are its features and applicability. How does it combine the features of product and process layout?	6	1	1
	b.	When MPS enforces the same rules as that of MRP, why is it needed?	6	1	1
	c.	Why MRP II is the more developed and refined version of MRP I? How MRP II has evolved into ERP? What do you understand by best practices codified into these packages? What are the deployment options for ERP and issues concerning their implementation.	6	1	1