

**VPM's**  
**DR VN BRIMS, Thane**  
**Programme: MMS(Operations) (2015-17)**  
**Third Semester Examination October 2016**

<b>Subject</b>	<b>Manufacturing Resources Planning and Control</b>		
<b>Roll No.</b>		<b>Marks</b>	<b>60 Marks</b>
<b>Total No. of Questions</b>	<b>7</b>	<b>Duration</b>	<b>3 Hours</b>
<b>Total No. of printed pages</b>		<b>Date</b>	<b>26.10.2016</b>

**Note: Q1 is compulsory and solve any FOUR from the remaining SIX questions.**

**Q1) Case study: 20 Marks (Compulsory)**

Avon Cycles is one of the top bicycle manufacturing companies in India. Prior to the year 2000, it used to manufacture 3000 bicycles per day. The company had about a hundred models of bicycles and employed 3000 people. Its turnover was Rs 200cr. Until 1997 all the planning and control function were done manually at their plant in Ludhiana outskirts. They had a fat ledger for accounting and was the only means of checking inventories, planning production, and preparing parts lists. Manual processes were slow and created many delays, numerous steps in planning and authorization and a lot of paper work. The effectiveness of planning was very inadequate. Frequent changes in schedule and mixed priorities played havoc, resulting in avoidable production stoppages and considerable costs. With the increase in competition, managing the large number of models and managing the lead times and delivery quotes to customers was becoming difficult. In 2000, Avon made a decision to go for an Enterprise Resource Planning software. A good ERP software would be able to overcome all these problems and also increase productivity. Based on the costs and the utility of the available ERP packages, Avon narrowed down the choice to Ebizframe. The investment in the ERP system would be Rs 75lacs and this included the ERP software, hardware, implementation and training. Phase –I of the implementation of software was completed in the year 2000. This phase covered the Sales, Exports , Purchase and HR modules. In Phase-2 the company proposed to implement Production planning.

The benefits of Phase-I were many. There was an 80% reduction in the time taken to perform various tasks. Earlier what used to take 10 days took only 2 days after ERP implementation. The Senior Management was able to track all the transactions and stay in touch with the operations of the company. They could also spend more time on planning future expansion that Avon should undertake. There were also significant cost savings and inventory was also rationalized.

Progressive organizations use alternative resource planning methodologies to remain competitive in the market. ERP is a modern version of resources planning that evolved from its humble beginnings in 1970. The benefits of ERP are typical of what happened at Avon.

**Questions : Attempt any two out of three**

1. Suppose that you are an Operations Manager of Avon Cycles, how would you plan the implementation of an ERP system in your company.
2. Avon used the ERP to track various transactions. List and describe some important transactions that could be tracked by an ERP
3. Avon cycles produces an assembly X that is used in several bicycle models. The current stock is 60 units. They will manufacture more in production run lots of 90 units. Develop a tentative master schedule for the demand shown below

Initial Inventory =60

Production Run=90 Units

Time in Weeks

	1	2	3	4	5	6	7	8	9	10
Cust. Fo'Cast		5	30	40	50	40	50	50	50	50
Interplant F'Cast			5			5			5	
Cust.Orders	40	40	30	10	10	5				
W/House Orders	15	10		5						

**Attempt Any FOUR from the Remaining SIX Questions**

**Q2) Any two from (a) or (b) or (c) ————— (5x2) = 10 Marks**

- a) Explain how forecasting helps an organization to reduce uncertainty.
- b) What is the best forecasting method for i) making a forecast of new product launch ii) making a sales plan for the next six months.
- c) Ganesh Restaurant is known for a specialty food item. Estimating the demand during the peak hours ( 6.00pm to 8.00pm). The Manager of Ganesh Restaurant collected information for the specialty during the past six weeks in the following data

Week-No	1	2	3	4	5	6
Demand (units)	80	95	75	110	100	90

Forecast the demand for the 7 th week using the 3 weekly moving average method. What is the Mean absolute deviation ( MAD) using this method.

**Q3) Any two from (a) or (b) or (c) ————— (5x2) = 10 Marks**

- a) What do the terms ‘ Capacity Augmentation’ and “Capacity Adjustment” mean? What are some methods followed to augment capacity
- b) What are the typical methods used to plan the Long term capacity planning. Explain with an example some important criteria used to make decisions considering expanding existing capacity
- c) A subcontractor for a new automobile plant wishes to install enough robots to assemble 200000 control panels per year. The assembly operation takes 10 min per panel. The output from the robots is typically 4% defective. How many are needed if each one is available for 4000 hours of capacity per year.

**Q4) Any two from (a) or (b) or (c) ————— (5x2) = 10 Marks**

- a) Explain the differences between Aggregate Production Plan(APP) and the Master Production Schedule( MPS
- b) Explain the role of MRP and CRP in a service outlet such as a Fast food Restaurant
- c) Caltronix has estimated the following demand requirement for the forthcoming work periods which represents a complete demand cycle. Caltronix is a going concern and expects the next demand cycle to similar to this one.

Period	1	2	3	4	5	6	7	8	9	10
Forecast	400	400	600	800	1200	1200	600	200	200	400

Maintain a stable workforce capable of produce 600 units per period and meet demand by overtime production at a premium of Rs 40 per unit Idle time cost are equivalent to Rs 60 per unit. Find the total cost of this plan.

**Q5) Any two from (a) or (b) or (c) ————— (5x2) = 10 Marks**

- a) Explain what you mean by the river flow analogy of the system of JIT manufacturing.
- b) How would a Kanban System work in the case of say a Bicycle Manufacturing Company.
- c) Clear Lake foundry produces three types of castings, A,B,C to customer orders. The standard hours per unit and the proposed delivery schedule over the next five periods are as shown below

Product	StdHrs per unit	Demand units per period				
		1	2	3	4	5
A	10	8	10	10	8	10
B	60	4	8	2	-	2
C	30	10	6	--	30	20

Plant capacity is set at 620 standard hours per period, based on a single shift operation

- a) Arrange the data into a tentative master schedule in make to order format
- b) What changes would you recommend to better utilize plant capacity.

**Q6) Any two from (a) or (b) or (c) ————— (5x2) = 10 Marks**

a) What is the importance of Operations Analysis?. What are some important factors to consider while analyzing operations of say a service such as provided by Just Dial?

b) List a few performance measures used to analyze operations. Design a template for analyzing an assembly line making Desktop Computers

c)Analysts at medical center have found that the time to perform an operation follows a 94% learning curve. The fourth operation took 212 min. If the same trend continues, what time could the analysts expect for 36<sup>th</sup> operation. The table below provides a reference of the learning curve.

Learning Curve table

% Base→	100	300	400	800	900	1000
90%-->	1	.8462	.8100	.7290	.7161	.7047
94-→	1	.9066	.8836	.8346	.8219	.8142

**Q7) Any two from (a) or (b) or (c) ————— (5x2) = 10 Marks**

a) What are the important functions performed by the MPS in Manufacturing

b) What is the relationship of Closed Loop MRP in MRP-II

c) What are the different classes of ERP implementers?. Describe the steps for successful ERP implementation for Manufacturing Planning and control