VPM's
DR VN BRIMS, Thane
Programme: MMS (2018-20) (Operations)
Third Semester Examination October 2019

Subject	**Manufacturing Resource Planning & Control.**		
Roll No.		**Marks**	**60 Marks**
Total No. of Questions	**7**	**Duration**	**3 Hours**
Total No. of printed pages		**Date**	**18.10.2019**

Instructions:-

- **Q. No 1** is compulsory.
- Attempt **Any Four** from the Remaining Six Questions.
- Figures to the right indicate marks in full.

Q.1. Case Study (20 Marks)

HONDA 'S MIXED MODEL ASEMBLY LINE

Honda has two major car manufacturing facilities in Japan-one at Sayama , north of Tokyo, and the other at Suzuka, west of Nagoya. The Sayama plant is the oldest one and its two assembly lines can make up to 600,000 vehicles a year. Suzuka‟s three assembly lines have a maximum capacity of around 800,000 vehicles a year. The production lines at both the plants are capable enough of making various models of cars simultaneously. For instance, at Sayama, seven types of cars can be assembled on the same assembly line-the basic Accord, Prelude, and Legend, the two –door Legend, the Accord-derived Accord Inspire, Vigor, and Ascot. The main advantage of the mixed model assembly line is that the declining demand for one model can be counterbalanced wit increased demand for others.

Mixed models on single lines is no longer a novelty in the automobile industry. Toyota has a better-known variant of such an assembly line. Toyota arranges different models one after the other on the conveyors across the line to balance the workload for workers and to balance the delivery of parts. On the other hand Honda has always produced in lots (Typically in factors of 60 cars) of one model at a time and the cars are exactly the same in all respects (e.g red Civics, left-hand drive, to be exported to Europe).

At Sayama, several batches of different derivative Accords may be manufactured before the line is switched to make Preludes for several batches. Models may be switched on the line three or four times in a day. This system allows easy panning of the supply of parts and at the same time offers flexibility in manufacturing according to fluctuating demand patterns.

Unlike the Toyota system of mixing the cars to accommodate the workers who stay at fixed work stations or in fixed groups, the Honda production system reorganizes the workforce, when necessary, with groups of workers moving about the assembly line to balance the workload. While designing a new model, it is kept in mind that it will produced on the existing line with the same fixed equipment across the line. This is necessary to avoid staggering investments for making changes in the existing assembly line to suit the design requirement of a new model.

There are however, a few limitations of such a system. For example, the dimensions of the Honda Accord station wagon, introduced at Gilda‟s Marysville plant (USA), were designed to fit the existing production equipment. Hence, the third compartment was not very large and the rear window sloped forward.

Honda is also known for the complete metamorphosis of its Suzuka plant. This plant was opened in 1960 for manufacturing motorcycles. By the mid-1980, Suzuka became the highest output motorcycle factory in the world. The same plant ahead

started producing automobiles in 1967. Today this plant manufactures only automobiles after the motorcycle production was transferred completely to the exclusive motorcycle plant at Kumamoto in 1991 (Mair 1994).

Questions:

1. Critically compare the mixed model assembly lines of Honda and Toyota. Which approach is better according to you? (10 Marks)
2. Suppose Honda wants to follow Toyota's mixed model assembly system of having different models of cars arranged one after the otheron the assembly line instead of producing a batch of a single model for a few hours. Assume that Honda's City and accord models have to be produced on the assembly line and the chassis of both require a different type of drill to be done in the fabrication line. The drilling time for the City chassis (say,C) is 2 minutes and the Accord chassis (Say A) is 6 minutes. The final assembly requires the number pf C's to be twice the number of A's. In what balanced sequence should the chassis of C & A be arranged on the fabrication line so that C= 2A? Assume eight working hours per day

Q.2. Attempt any two from (a), (b) & (c). (5x2 = 10)

(a). Explain the inputs & outputs of CRP.

(b). What is MPS ? Explain the important functions of MPS with an example.

(c). Explain Infinite & finite loading.

Q.3. Attempt any two from (a), (b) & (c). (5x2 = 10)

(a). Explain the purpose & concept of LOB.

(b). Give the framework of MRP II.

(c(. Explain the time fences in MPS.

Q.4. Attempt any two from (a), (b) & (c). (5x2 = 10)

(a). Explain MRP inputs & outputs.

(b). What do you mean by Bill of Materials Structure & types of BOM. Give an example.

(c). Explain between design capacity & system capacity.

Q.5. Attempt any two from (a), (b) & (c). (5x2 = 10)

a. A product line mfg. shoes has five stations in series whose individual capacities per shift are stated in the following table. The actual of the line is 500 pairs per shift. Find the system capacity and system efficiency.

Station No.	**1**	**2**	**3**	**4**	**5**
Individual capacity/shift	**600**	**650**	**650**	**550**	**600**

b. Laxmi Industries is planning for expanding its production operation. It has identified three different technologies for meeting the goal. The initial outlay and annual revenues with respect to each of the are summarized in the following table. Suggest the best technology which is to be implemented based on present worth method of comparison assuming 20% interest rate compounded annually.

	Initial outlay (Rs.)	**Annual Revenue (Rs.)**	**Life (yrs.)**
Technology 1	1200000	400000	15
Technology 2	2000000	600000	15
Technology 3	1800000	500000	15

c. Explain Rough-cut capacity planning with an example

Q.6. Attempt any two from (a), (b) & (c). (5x2 = 10)

(a). Explain demand forecasting & Objectives of demand forecasting.

(b). The table below gives the date on current inventory, production lot sizes, standard hours per unit and the forecast of demand for all items required for a product. Determine the sequence of production (schedule) using the ROT (Run Out Time) method.The available production capacity is 320 hours. Analyse the effect of capacity on the schedule.

Item	Std. hrs/unit	Lot Size	Forecast demand/wk	Current inventory	Machine hr/order
A	0.20	200	70	200	40
B	0.40	300	100	240	120
C	0.30	200	80	260	60
D	0.40	400	120	160	160

(c). Complete the material requirements plan for item A given below. Note that this item has an independent demand that necessitates that a safety stock of 40 units be maintained. Order quantity = 70; lead time = 4 weeks; Safety stock = 40.

Weeks	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Gross requirements	**20**	**20**	**25**	**20**	**20**	**25**	**20**	**20**	**30**	**25**	**25**	**25**
Scheduled/planned receipts		**70**										
On hand at end of period 65												
Planned order release												

Q.7. Attempt any two from (a), (b) & (c). (5x2 = 10)

(a). The forecast demand for remote handsets for next six weeks is 30, 35, 38, 32, 32, 30. And the number of orders booked at the start of the MPS planning period is 23, 40, 24, 22, 38, 22. Prepare an MPS schedule for the telephone set manufacturer. Give :: Inventory on hand = 40; lead time = 1 week; production lot size = 80 units; quantity on hand = 40.

(b). Explain in brief Final Assemble Schedule.

(c). Elaborate on Available to Promise with an example.