BACHELOR OF PRODUCTION ENGG. EXAMINATION, 2018

(2^{nd} Year-2^{nd} Semester)

SUBJECT – **Production Management**

Time: Three hours Full Marks: 100

Answer Question **No. 1** and any ***three*** from the rest.

1. Answer (a) and any ***four*** from the following:

(a) Define "Production Systems" and "Production Management". 4

What is the difference between "Production Management" and "Operation Management"? 3

Name three types of transformation process and give example for each. 3

How do poor work culture and energy storage present new challenges to the production managers? 2

(b) Explain the cycle of Production functions and indicate their relative position for a large industrial organization. What is lead time factor and how it influences the planning phase of the cycle of production functions? 7

(c) Identify different existing organizational pattern of the production firm on the basis of their ownership. Which type of pattern is most advantageous for Indian insurance sector? Explain your answer in brief. 7

(d) What is forecasting? How it differs from prediction? Explain some of the variations of the historical data that influence the forecasting estimation. Differentiate between Moving Average and Exponential forecasting model. 7

(e) How "Queueing theory" can be utilized for controlling in process inventory? Develop one basic queueing model considering single channel and single phase waiting line structure. 7

(f) Explain different situation of "Stock Out" and how to overcome those in an inventory policy? How ABC and VED analysis can be combined to provide more effective inventory management? 7

(g) What are the major components of traditional Production, Planning and Control (PPC) functions? Explain all of them in brief. 7

2. (a) Describe in brief "Technology Forecasting". 5

(b) Quarterly sale of a product are given below:

Year	Winter	Spring	Summer	Fall
1	81	64	73	80
2	80	73	84	74
3	86	59	69	73
4	95	72	74	60
5	105	68	75	64

Using moving average model of forecasting determine the "Seasonal Adjusted Index" and calculate the forecasting sales for each of the four quarter in year '6'. 15

3. (a) Five jobs can be performed in any one of the four machines. The time required for machining the jobs through four machines are listed below. Determine the assignment that will provide the most optimal loading.

Job	Work Centres			
	M_1	M_2	M_3	M_4
A	10	9	8	12
B	3	4	5	2
C	25	20	14	16
D	7	9	10	9
E	18	14	16	25

10

(b) Auto Painters and Tinkers (APT) are planning for short term on a daily basis. They have four lines for painting and tinkering jobs, through line 1, 2, 3 and 4. Today, they have seven jobs A, B, C, D, E, F and G to allocated to the lines. The following table, gives the estimates of the job-times in hours. While line 1 and 2 have a capacity of 12 hours each, line 3 and 4 work longer, i.e, 18 hours each. The jobs are classified in order of priority as: A, B, C, D, E, F and G. How would you allocate the jobs to different lines?

Job	Lines			
	1	2	3	4
A	7	14	11	18
B	19	9	14	10
C	15	25	20	9
D	6	9	7	14
E	4	8	9	5
F	10	12	11	15
G	8	5	4	7

10

4. (a) What is "Recording Level" of an inventory policy? Deduce the Economic Order Quantity model for an organization and also identify limitations of this inventory model. 8

(b) Consider an inventory situation in a manufacturing unit where milling cutters are ordered in boxes of one dozen per box. Annual demand is 400 boxes. The cost for placing an order is Rs. 20% based on the average yearly inventory value. Supplier offers a quantity discount schedule in the following manner:

Quantity (Boxes)	Price per box (in Rs.)
1-49	2900
50-99	2800
100 or more	2700

Establish an optimum inventory policy. 12

5. Assembly of a component requires the performance of 15 work elements which are governed by certain precedence constraints as shows blow:

Work Elements	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Immediate Predecessors	-	-	-	0	0,1	1	2	2	3	4,5	7	9,6	11	8,12,10	13
Tune (in min.)	6	5	8	9	5	4	5	6	10	5	6	2	5	12	10

(i) Construct the precedence diagram for the assembly operation.
(ii) Base on heuristic method assign work elements to work station in order to minimize the number of work stations in the line.
(iii) Calculate the balancing loss of the proposed assembly line. 6+10+4

6. (a) Identify major objectives of Material Requirements Planning (MRP). Explain MRP with a flow chart. Differentiate between Material Requirements Planning (MRP) and Manufacturing Resource Planning (MRP II). 3+5+4

(b) A manufacturer has received an order for 250 units of product "G" to be completed and supplied at the eighth week from now. The product structure tree diagram is shown below. There is no stock on hand and none on order. Determine the size of the orders for each item and when the orders should be placed. 8