Code No: **R4203A**   # R10   **Set No. 1**

IV B.Tech II Semester Regular Examinations, April/May - 2014
PRODUCTION PLANNING AND CONTROL
(Common to Mechanical Engineering and Automobile Engineering)

Time : 3 hours   **Max. Marks: 75**

Answer any Five Questions
All Questions carry equal marks
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1 a) Explain the importance of PPC department in a typical production system. [8]
   b) Write about the Elements of production control [7]

2 a) Explain various benefits of forecasting methods? [5]
   b) A computer software firm has experienced the following demand for its "Personal Finance" software package

Period	1	2	3	4	5	6	7	8
Units	56	61	55	70	66	65	72	75

   i) Develop an exponential smoothing forecast using $\alpha=0.4$ and an adjusted exponential smoothing using $\alpha=0.4$ and $\beta=0.20$
   ii) Compare the accuracy of two forecasts using MAD and cumulative error [10]

3 a) Explain P and Q systems of controlling the inventories with neat diagrams. [8]
   b) The annual demand for an automobile component is 36000 units. The carrying cost is Rs. 0.50/unit/year, the ordering cost is Rs.25.00 per order and the shortage cost is Rs.15.00/unit/year. Find the optimal values of the following:
   i) Economic Ordering Quantity
   ii) Maximum inventory
   iii) Maximum shortage quantity
   iv) Cycle time. [7]

4 a) Explain the logic of Material Requirement Planning System? Explain with example [8]
   b) Explain various benefits and demerits of JIT system [7]

5 a) What are the important factors that affecting routing procedure. [8]
   b) Explain bills of material importance in production control. How does it help in assembly production. [7]

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6 a) Categorize various scheduling techniques and list significance of each method briefly   [8]

b) A house painting contractor has five houses to paint. Following are the estimated times required to paint each house and due date for completion.

House	Estimated Time (days)	Due date
A	2.5	8
B	4.0	10
C	3.0	7
D	5.0	14
E	2.0	16

Use the Shortest Processing Time rule to sequence the five jobs Compute average flow time and average tardiness per job using this sequence   [7]

7 a) What is expediting and explain about the duties of expediter?   [7]

b) The Company needs to produce 4000 boxes of blocks per 40 hour week to meet upcoming holiday demand. The process of making blocks can be broken down into six work elements. The precedence and time requirements for each element are as follows. a) Draw precedence diagram for the production process b) Determine minimum number of work stations and c) balance efficiency.

Work element	Precedence	Performance time (min)
A	-	0.1
B	A	0.4
C	A	0.5
D	-	0.2
E	C,D	0.6
F	B,E	0.4

[8]

8 a) What is dispatching? What is its significance? Enumerate its advantages in production control.   [7]

b) Explain about the applications of computer in production planning and control.   [8]

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1 a) Explain the scope of production planning and control. Explain the boundaries with the help of organization chart [8]

   b) Give the internal organization of PPC department and Compare job shop and Batch type production systems [7]

2 a) List out various qualitative techniques for forecasting [7]

   b) A manufacturing company has monthly demand for one of its products as follows:

Month	Feb	March	April	May	June	July	August	Sept
Demand	520	490	550	580	600	420	510	610

   i) Develop a three period moving average forecast
   ii) Develop three period weighted moving average forecast with weights of 0.50, 0.30 and 0.20 for the most recent demand values. [8]

3 a) Define inventory? Explain various functions of inventory [7]

   b) Alpha industry estimates that it will sell 12000 units of its product for the forthcoming year. The ordering cost is Rs. 100 per order and the carrying cost per unit per year is 20% of the purchase price per unit. The purchase price per unit is Rs.50.Find
   i)   Economic Order quantity
   ii)   No. Of orders per year
   iii) Time between successive orders. [8]

4 a) Explain the various steps of Line of Balance technique? [7]
   b) What is ERP system? Explain any three segments of ERP system [8]

5 a) Define routing & its significance. Explain about the important components of routing sheets? [8]
   b) Explain about difference with loading in detail? [7]

Code No: **R4203A**   **R10**   Set No. 2

6 a) Explain about Scheduling techniques in brief?   [8]
   b) Write about standard scheduling policies in detail?   [7]

7 a) Explain various types of expediting procedures   [8]
   b) What is difference between an aggregate plan and a master production
       schedule**?**   [7]

8 a) Describe advantages & disadvantages of dispatching jobs all at once and
       operation by operation.   [8]
   b) Explain about the types of follow up in detail?   [7]

Code No: **R4203A**   **R10**   **Set No. 3**

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Time : 3 hours   **Max. Marks: 75**

Answer any Five Questions

All Questions carry equal marks

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1 a) Explain various objectives of Production Planning Control (PPC) department. [8]
   b) Discuss different types of production systems with suitable examples? [7]

2 a) List out various quantitative techniques for forecasting? [7]
   b) Forecast the production for next two years when the production quantity for
       last ten years is as follows:
       200,225,235,240,255,260,265,275,270,271
       Use the following methods and comment on results
              i) Simple average
              ii) Moving average (3 years and 5 years)
              ii) Exponential smoothing for $\alpha=0.3$ and 0.7 [8]

3 a) Explain various costs associated with inventory. [7]
   b) If a product is to be manufactured within the company, the details are as
       follows:
              Annual demand rate, =24000 units
              Production rate, =48000 units
              Setup cost, =Rs. 200 per setup
              Carrying cost,= Rs.20/unit/year. [8]
       Find the a) EOQ and b) Cycle time

4 a) Explain the philosophy involved in JIT system. What are the major
       requirements for a successful JIT implementation? [8]
   b) Distinguish between Line Balancing and Line of Balance. [7]

5 a) What are the reasons for scheduling? Explain how scheduling improves the
       process of production control significantly. [7]
   b) Explain about steps involved in routing procedure? [8]

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6 a) Compare and contrast different scheduling policies.   [7]
   b) David is an independent computer software consultant. After completing his most recent project, he had five jobs awaiting completion. Following are the estimated work times required to complete each job and due dates requested by customers

Job	Processing time	Due date(days from present)
A	12	52
B	16	37
C	8	28
D	20	57
E	6	31

Construct job sequences using the Shortest Processing Time rule, Earliest Due Date rule and Compute the average flow time.   [8]

7 a) List out various aspects of production control? Explain any three aspects in detail.   [8]
   b) What are the advantages and disadvantages of using a chase demand strategy for developing an aggregate planning?   [7]

8 a) Compare & contrast dispatching centralized control VS Dispatching decentralized control.   [8]
   b) Explain various activities of dispatcher   [7]

Code No: **R4203A**   **R10**   **Set No. 4**

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Time : 3 hours   **Max. Marks: 75**

Answer any Five Questions
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*****

1 a) Explain various functions of Production Planning Control (PPC) department. [8]
  b) What are the advantages of production planning and control and Explain various principles and procedures of production control? [7]

2 a) What is forecasting and Explain the importance of forecasting? [7]
  b) The cost per standardized long distance phone call has been decreasing over time. Using the following data for the last 8 years

Year	1	2	3	4	5	6	7	8
Standardized Cost	3.25	3.05	2.98	2.93	2.91	2.58	2.44	2.37

   a) Use linear regression to compute an expression for cost as a linear function of time
   b) Using above equation, predict the standardized cost for year 10 [8]

3 a) Compare VED analysis with ABC analysis. [8]
  b) A company requires 10000 units of an item per annum. The cost of ordering is rs.100 per order. The inventory carrying cost is 20%. The unit price of the item is Rs.10. Calculate a) the economic order quantity b) Optimal total annual cost c) time between the orders. [7]

4 a) Explain various steps which are followed in a Kanban system [7]
  b) Explain about the MRP II system in detail? [8]

5 a) Explain the role of bills of material with the help of block diagram [7]
  b) What is the significance of loading? Explain with the help of machine load record. [8]

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Code No: **R4203A**   **R10**   **Set No. 4**

6 a) List out various scheduling rules and Explain at least three of them   [7]

   b) At an electronics repair shop all items are first diagnosed by an expert technician. He estimates the amount of repair work required and assigns it to a second technician for completion. The second technician has five jobs awaiting work with the expected work time required and due date listed below

Job	Expected repair time	Due date
A	5.5	8
B	6.0	16
C	3.5	16
D	5.0	20
E	4.0	24

   Construct job sequences using the Critical ratio rule, and Slack Time Remaining rule and Compute the average flow time   [8]

7 a) What is aggregate planning and Explain various objectives of aggregate planning   [7]

   b) List out various heuristics for line balancing problem. Explain any one heuristic in detail with example   [8]

8 a) What is material follow up? What is the role of purchase department in material follow up?   [7]

   b) List out various forms raised by dispatcher? Explain any three with neat sketch   [8]