IV B. Tech I Semester Regular Examinations, November – 2022
PRODUCTION PLANNING & CONTROL
(Mechanical Engineering)

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

Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks
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UNIT-I

1 a) Describe the functions of production planning and control in detail. [7]
   b) What is an internal organization of a department? Explain it briefly by taking an example. [8]
      (OR)
2 a) Explain various elements of Production Control. [7]
   b) Explain the importance of the PPC department in a typical production system. [8]

UNIT-II

3 a) Describe the 'Least Square Method' of sales forecasting with its advantages and limitations. [7]
   b) Forecast the demand for the following series by exponential smoothing method by taking α = 0.3 and 0.6 [8]

Period	1	2	3	4	5	6	7	8	9	10
Actual demand	10	12	8	11	9	10	15	14	16	15

(OR)

4 a) Using the exponential smoothing technique, Compute the forecasts from the following data (time series) under the situations when α = 0.7.Compute the forecast for the 11th period? [7]

| Month	1	2	3	4	5	6	7	8	9	10
Demand	28	30	32	31	27	26	30	33	32	31

   b) Explain the general principles of forecasting techniques. [8]

UNIT-III

5 a) Define inventory. What are the various types of inventory? Why are they maintained? [7]
   b) A factory needs 36000 units annually of a component that cost Rs.2 per unit. The cost of each order placing is Rs.25 and the inventory carrying cost is Rs.10 per year. [8]
      (i) Find the economic lot size and the total inventory cost.
      (ii) What is the time between the placing of orders?
      (iii) The supplier offers a 2% discount if a single order is placed. Should the company accept it?

(OR)
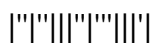
6   a)   What are the advantages of inventory control? What are the symptoms of poor inventory control?   [7]

      b)   Explain P and Q systems of controlling the inventories with neat diagrams.   [8]

UNIT-IV

7   a)   Briefly write about measures of capacity planning and effective factors of capacity planning.   [7]

      b)   What is aggregate planning? Write its functions, merits, and demerits.   [8]

(OR)

8   a)   Explain the concept of Chase planning.   [7]

      b)   Define aggregate planning and write the various inputs and outputs of aggregate planning with a neat block diagram.   [8]

UNIT-V

9   a)   What is the role of bill of materials? How demand affects the bill of materials?   [7]

      b)   What is the material follow-up? What is the role of the purchasing department in material follow-up?   [8]

(OR)

10   a)   Explain the inputs and outputs of the MRP system.   [7]

      b)   Explain the scope of ERP and difficulties in implementation.   [8]
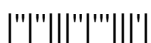
Code No: R194103C **R19** Set No. 2

IV B. Tech I Semester Regular Examinations, November – 2022
PRODUCTION PLANNING & CONTROL
(Mechanical Engineering)
Time: 3 hours   Max. Marks: 75

Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks
*****
UNIT-I

1 a) Discuss different elements of production planning and control. [7]
   b) State the purpose of PPC in an industry. Give a typical organizational [8]
       structure of PPC department.

(OR)

2 a) Define production planning. State its objectives. List the information [7]
       required for production planning.
   b) Describe the functions of Production planning and control. [8]

UNIT-II

3 a) Describe the 'Exponential Smoothing Method' of sales forecasting. [7]
       State its advantages and limitations.
   b) Find the trend using the least square method for the date below. Also, [8]
       estimate demand for 1984.

| Year	1975	1976	1977	1978	1979	1980	1981
Demand in 1000 units	85	75	80	72	65	60	55

(OR)

4 a) Name and describe the various factors affecting sales forecasting. [7]
   b) Using the exponential smoothing technique, compute the forecasts from [8]
       the following data under the situations when $\alpha = 0.3$ and $\alpha = 0.7$.
       Compute the forecast for the 8th period. Which forecast do you accept?
       Give reasons.

Week	1	2	3	4	5	6	7
Sales	39	44	40	45	38	43	39

UNIT-III

5 a) What is meant by VED analysis? What is its significance? [7]
   b) Explain the significance of the EOQ formula. What are its limitations? [8]

(OR)

6 a) Explain the factors affecting the inventory costs. [7]
   b) Classify inventory models. Discuss briefly any one of them. [8]

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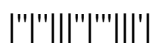
UNIT-IV

7   a)   Find the sequence that minimizes the total elapsed time required to complete the following jobs on three machines A, B, C. Calculate the idle time of individual machines and also the total idle of the system. (Processing time in Hrs.)   [7]

Job	1	2	3	4	5
Machine A	8	10	6	7	11
Machine B	5	6	2	3	4
Machine C	4	9	8	6	5

   b)   Define aggregate planning and write the various inputs and outputs of aggregate planning with a neat block diagram.   [8]

(OR)

8   a)   Explain short-term and long-term strategies of capacity planning.   [7]

   b)   Differentiate between aggregate and disaggregate planning.   [8]

UNIT-V

9   a)   What MRP I? What are the functions of MRP I? Describe the inputs and outputs of the same in detail.   [7]

   b)   Explain the process flow involved in Master Scheduling.   [8]

(OR)

10   a)   Explain the importance of the bill of material in the production line.   [7]

   b)   Differentiate between MRP I and MRP II.   [8]
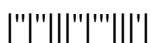
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IV B. Tech I Semester Regular Examinations, November – 2022
PRODUCTION PLANNING & CONTROL
(Mechanical Engineering)

Time: 3 hours   Max. Marks: 75

Answer any FIVE Questions
ONE Question from Each unit
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UNIT-I

1 a) What is PPC? What is the need for PPC?   [7]
   b) Discuss the objectives of production control.   [8]
                           (OR)
2 a) Discuss the benefits of Production planning and control. [7]
   b) Differentiate between production planning and production control. [8]

UNIT-II

3 a) Describe the least square method with its advantages and limitations. [7]
   b) Using the method of least squares, find the trend values for every five [8]
       years for the annual sales data given below. Also, estimate the annual sales
       for the year 1985.

Year	1980	1981	1982	1983	1984
Sales in Rs.	50000	65000	750000	52000	72000

                           (OR)
4 a) Explain the objectives of forecasting.   [7]
   b) One of the two-wheeler manufacturing companies experienced irregular [8]
       but usually increasing demand for three products. The demand was found
       to be 20 bikes for June and 540 bikes for July. They use a forecasting
       method that takes the average of the past year to forecast future demand.
       Using the simple average method demand forecast for June is found as 420
       bikes (Use a smoothing coefficient of 0.7 to weight the recent demand
       most heavily) and find the demand forecast for August.

UNIT-III

5 a) What is VED analysis? Explain its significance.   [7]
   b) ABC manufacturers produce 1, 25,000 oil seals each year to satisfy the [8]
       requirement of their clients. They order the metal for the bushing in a lot of
       30,000 units. It cost them $40 to place the order. The unit cost of the
       bushing is $0.12 and the estimated carrying cost is 25%unit cost. Find out
       the economic order quantity. What percentage of increases or decreases in
       order quantity is required so that the ordered quantity is Economic order
       quantity?
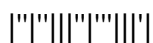
(OR)

6 a) What is meant by ABC analysis? What is its significance? [7]

b) M/s. KOBO Bearing Ltd is committed to supplying 24000 bearings per annum to M/s. Deluxe Fans on a steady daily basis. It is estimated that it costs 10 paise as inventory holding cost per bearing per month and the setup cost per run of bearing manufacture of Rs. = 324.
(i) What should be the optimum run size for bearing manufacture?
(ii) What should be the interval between two consecutive optimum runs?
(iii) Find out the minimum inventory holding cost? [8]

UNIT-IV

7 a) What is aggregate planning? Explain the pure strategies of aggregate planning. [7]

b) What is capacity planning? How to measure capacity planning? [8]

(OR)

8 a) A factory manufactures two products A and B. To manufacture one unit of A, 1.5 machine hours and 2.5 labor hours are required. To manufacture product B, 2.5 machine hours and 1.5 labor hours are required. In a month, 300 machine hours and 240 labor hours are available. Profit per unit for A is Rs. 50 and for B is Rs. 40. Formulate as LPP and Solve it. [7]

b) What are economies of scale explain with an example. What is Disaggregating [8]

UNIT-V

9 a) What is the master production schedule? Explain with an example. [7]

b) The precedence relationship of an assembly line is as follows. The desired output capacity is 48 numbers per day. If the factory runs two shifts per day, each shift 8 hrs duration.
(i) Draw the precedence diagram. (ii) Determine the cycle time
(iii) Balance the line. Calculate line efficiency, balance delay, and smoothness index. [8]

Work element	Duration (min)	Immediate precedence
1	10	-
2	6	1
3	5	2
4	5	2
5	8	2
6	9	3,4,5
7	8	6

(OR)

10 a) Distinguish MRP-I, MRP-II, and ERP. [7]

b) What is line balancing methods? Explain any two in detail. [8]
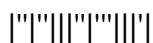
Code No: R194103C **R19** Set No. 4

IV B. Tech I Semester Regular Examinations, November – 2022
PRODUCTION PLANNING & CONTROL
(Mechanical Engineering)
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UNIT-I

1   a)   Explain the relationship between 'Production planning' and 'control'.   [7]
    b)   Describe the activities in the follow-up or control phase of PPC.   [8]
(OR)
2   a)   Describe the functions of Production planning and control.   [7]
    b)   Define production planning. State its objectives. List the information [8]
         required for production planning.

UNIT-II

3   a)   Define forecasting and its importance in the industry.   [7]
   b)   Forecast the demand for the following series by exponential smoothing [8]
         Method.

Period	1	2	3	4	5	6	7	8	9	10
Actual Demand	10	12	8	11	9	10	15	14	16	15

(OR)
4   a)   What are the different types of forecasting? Explain.   [7]
    b)   Name and describe the various factors affecting sales forecasting.   [8]

UNIT-III

5   a)   What does the various inventory cost? Explain the factors affecting the [7]
         inventory costs.
    b)   Describe ABC & VED analysis.   [8]
(OR)
6   a)   Derive the expression for EOQ when the demand for the item is uniform. [7]
         The production rate is infinite and no stocks out are allowed.
    b)   A company requires 10000 units of an item per annum. The cost of [8]
         ordering is Rs. 150 per order. The inventory carrying cost is 30%. The
         unit price of the item is Rs. 12. Calculate: (i) The economic order quantity
         (ii) the Optimal total annual cost (iii) the Time between the orders.
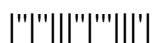
UNIT-IV

7 a) What is Capacity Planning? What are the different types of Capacity [7] Planning? When Is Capacity Planning required?

   b) What are long-term and short-term strategies? [8]

(OR)

8 a) What is aggregate planning and explain it in detail? [7]

   b) Aravind Chemicals Company manufactures two chemicals **A** and **B** which [8] are sold to the manufacturers of soaps and detergents. On the basis of next month's demand, the management has decided that the total production of chemicals **A** and **B** should be at least 350 kilograms. Moreover, a major customer's order for 125 kilograms of product A must also be supplied. Product **A** requires two hours of processing time per kilogram, and product **B** Requires one hour of processing time per kilogram. For the coming month, 600 hours of processing time are available. The company wants to meet the above requirements at a minimum total production cost. The production costs are Rs.2 and Rs.3 per kilo of products **A** and **B** respectively. The company wants to determine the optimal product mix and the total minimum cost. i)Formulate the above as a linear programming problem. ii) Solve the problem with the graphical method.

UNIT-V

9 a) Write a short note on the bill of material with an example. [7]

   b) Describe machine loading and scheduling with case study. [8]

(OR)

10 a) What is scheduling? What are the different scheduling methods? [7]

   b) Differentiate between MRP-I & MRP-II. [8]