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Question Paper Code : 91564

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2025.

Seventh Semester

Civil Engineering

OIM 353 – PRODUCTION PLANNING AND CONTROL

(Common to : Aeronautical Engineering/Aerospace Engineering/Automobile Engineering/Biomedical Engineering/Computer Science and Design/Computer Science and Engineering/Computer Science and Engineering (Artificial Intelligence and Machine Learning)/Computer Science and Engineering (Cyber Security)/Computer and Communication Engineering/Electrical and Electronics Engineering/Electronics and Communication Engineering/Electronics and Instrumentation Engineering/Electronics and Telecommunication Engineering/Environmental Engineering/Geoinformatics Engineering/Industrial Engineering/Industrial Engineering and Management/Instrumentation and Control Engineering/Manufacturing Engineering/Marine Engineering/Materials Science and Engineering/Mechanical Engineering/Mechanical and Automation Engineering/Mechatronics Engineering/Medical Electronics/Petrochemical Engineering/Production Engineering/Robotics and Automation/Safety and Fire Engineering/Agricultural Engineering/Artificial Intelligence and Data Science/Bio Technology/Biotechnology and Biochemical Engineering/Chemical Engineering/Chemical and Electrochemical Engineering/Computer Science and Business Systems/Fashion Technology/Food Technology/Handloom and Textile Technology/Information Technology/Petrochemical Technology/Petroleum Engineering/Pharmaceutical Technology/Plastic Technology/Textile Chemistry/Textile Technology)

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Differentiate between product design and product development.
2. What is standardization and mention the benefits of standardization.
3. Name the few charts used in motion studies.
4. State about critical analysis.

5. List the information that can be obtained from the system maintenance concept.
6. Differentiate primary and secondary functions with respect to value analysis.
7. What is MRP? List the various inputs required for MRP.
8. Show the various recording methods for progressing purpose.
9. Define the terms inventory and inventory control.
10. Compare Excess Stock and Stock out situations.

PART B — (5 × 13 = 65 marks)

11. (a) ABC Ltd is engaged in the manufacture of chairs. The cost of land, building, and machinery is Rs. 1,00,000. The cost of wood and labour for each chair is Rs. 40 and the selling price is Rs. 60. Find out the minimum number of chairs to be manufacture so that neither profit not loss is incurred by ABC limited.

Or

- (b) The fixed costs for the year 2000-01 are Rs. 6,00,000 variable cost per unit is Rs. 40. Each unit sells at Rs. 160, determine (i) breakeven point in terms of physical units and in terms of rupees (ii) if a sales volume of 5500 units has been expected, then what will the profit earned? (iii) if a profit target of Rs. 1,20,000 has been budgeted compute the number of units to be sold. (iv) If the company sells 6500 units, calculate the margin of safety and profit. (3 + 3 + 3 + 4)

12. (a) Describe in detail about production study followed in production industry.

Or

- (b) The time taken for 4 cycles of an operation using stop watch are given below :

Calculate the standard time for operation if :

- (i) Elements 2 and 4 are machine elements. (5)
- (ii) For remaining elements, operator is rated at 80%. (4)
- (iii) Total allowance are 12% of the normal time. (4)

Element Cycle time in minutes

	1	2	3	4
1	2.5	2.6	2.4	2.7
2	1.2	1.6	1.3	1.5
3	0.5	0.6	0.4	0.6
4	3.5	3.1	3.2	3.4
5	1.3	1.2	1.3	1.1

13. (a) Explain the steps involved in standard procedure for process planning. Also explain various types of process planning method.

Or

- (b) A machining centre has a product consisting of 5 stages in production sequence. Below table represent time and machine time.

Calculate the

- (i) Total operation time, (5)
(ii) Machine output, (4)
(iii) Efficiency of the machine. (4)

Operations :	1	2	3	4	5
Preparation time in Min :	1.5	1.4	1.3	1	2
Machine time in Min :	2	2.5	2.2	3	5

14. (a) Explain the procedure by which scheduling 2 jobs in machines can be done with suitable example.

Or

- (b) Five jobs are to be processed on three machines and the processing times in hours are given below. Find the optimal sequence of jobs so that total elapsed time is minimized.

Job	J1	J2	J3	J4	J5
A	5	7	6	9	5
B	2	1	4	5	3
C	3	7	5	6	7

15. (a) The annual demand for an item is 3200 units. The unit cost is Rs. 6 and the inventory carrying charges are estimated as 25% per annum. If the cost of one procurement is Rs. 150, Determine

- (i) Economic Order Quantity, (3)
(ii) Number of orders per year, (3)
(iii) Time between two consecutive orders (3)
(iv) Optimal cost. (4)

Or

- (b) Monthly consumption of an item is 500 units. The price per unit is Rs. 25. Inventory carrying cost is 16 percent and ordering cost is Rs. 50 per order. Lead time of 1 month stock. For a ROL i.e., Q-system, determine
- (i) Re-Order Quantity (3)
 - (ii) Minimum Level (3)
 - (iii) Re-order level (3)
 - (iv) Maximum level (2)
 - (v) Average inventory. (2)

PART C — (1 × 15 = 15 marks)

16. (a) Beta industry estimates that it will sell 10,000 units of its product for the forthcoming year. The ordering cost is Rs. 36 per order and the carrying cost per unit per year is 9% of the purchase price per unit which is Rs. 2. Determine: (i) EOQ (ii) Optimal number of orders to be placed per annum (iii) Minimum total cost of inventory per annum.

Or

- (b) For a product, the annual fixed cost is Rs. 2,00,000, while the annual profit is Rs. 40,000 and average monthly sales is 820 units. A new design is being planned with investment of Rs. 80,000 to be returned in 2 years. With the new design, the P/V ratio shall increase by 5%. Calculate the annual sales figure for the new design under two different conditions, as follows :
- (i) Net profit remains constant; (8)
 - (ii) In addition to the above profit, a yield of 10% on the capital invested will be obtained. (7)