

19 DEC 2022

Reg. No.

Question Paper Code

11483

B.E./B.Tech. - DEGREE EXAMINATIONS, NOV/DEC 2022
Seventh Semester
Mechanical Engineering
ME8793 - PROCESS PLANNING AND COST ESTIMATION
(Regulations 2017)

Duration: 3 Hours

Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

- | | <i>Marks,</i>
<i>K-Level, CO</i> |
|---|-------------------------------------|
| 1. List the objectives of process planning. | 2,K1, CO1 |
| 2. What are the factors affecting tooling selection? | 2,K2, CO1 |
| 3. Distinguish between jigs and fixtures. | 2,K1 CO2 |
| 4. What is meant by break-even point? | 2,K1 CO2 |
| 5. What are the functions of cost estimation? | 2,K1 CO3 |
| 6. Classify the allowances considered in cost estimation. | 2,K1 CO3 |
| 7. What are the various material losses which can occur in a forging shop? | 2,K1 CO4 |
| 8. Differentiate leftward and rightward welding. | 2,K1 CO4 |
| 9. Define "tool approach" and "tool over travel". | 2,K1 CO5 |
| 10. What are the typical data required for cutting time calculation in shaping? | 2,K2 CO6 |

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

11. a) Explain the two approaches in computer aided process planning. 13,K2,CO1
- OR**
- b) Explain process planning activities and documentation involved in preparation of process plan. 13,K2,CO1
12. a) Explain the set of documents required for process planning. 13,K2,CO2
- OR**
- b) Explain the factors to be considered in selection of process parameters. 13,K2,CO2
13. a) Explain the procedures followed for estimating the cost of an industrial product. 13,K2,CO3
- OR**
- b) Calculate the selling price per unit from the following data : 13,K2,CO3
Direct material cost = Rs. 8,000
Direct labour cost = 60 percent of direct material cost

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 - Create

11483

Direct expenses = 5 percent of direct labour cost
 Factory expenses = 120 percent of direct labour cost
 Administrative expenses = 80 percent direct labour cost
 Sales and distribution expenses = 10 percent of direct labour cost
 Profit = 8 percent of total cost
 No. of pieces produced = 200.

14. a) Calculate the net weight and gross weight for the component shown in Figure 1. Density of material used is 7.86 gm/cc. Also calculate:
- Length of 14 mm dia. bar required to forge one component.
 - Cost of forging/piece, if: Material cost = Rs. 80 per kg, Labour cost is Rs. 5 per piece, Overheads 150 percent of labour cost.

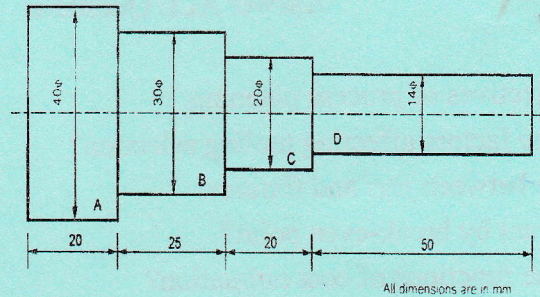


Figure 1

OR

- b) A lap welded joint is to be made as shown in Figure.2. Estimate the cost of weld from the following data:

| | | |
|----------------------------------|---|------------------------------|
| Thickness of plate | = | 10 mm |
| Electrode diameter | = | 6 mm |
| Minimum arc voltage | = | 30 Volts |
| Current used | = | 250 Amperes |
| Welding speed | = | 10 meters/hour |
| Electrode used perimeter of weld | = | 0.350 kgs |
| Labour rate | = | Rs. 40 per hour |
| Power rate | = | Rs. 3 per kWh |
| Electrode rate | = | Rs. 8.00 per kg |
| Efficiency of welding m/c | = | 50 percent |
| Connecting ratio | = | 0.4 |
| Overhead charges | = | 80 percent of direct charges |
| Labour accomplishment | = | 60 percent factor |

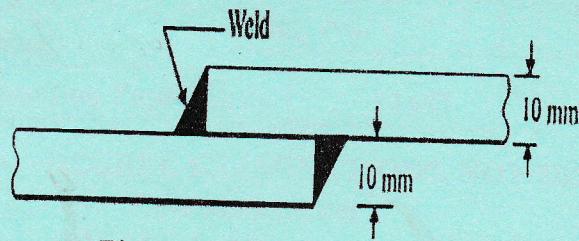


Figure 2

All dimensions are in mm.

15. a) Calculate the machining time required to produce one piece of the component shown in Figure 3 given below starting from 25 mm bar. *13,K2,CO5*
The following data is available. All dimensions are in mm.

For turning:

Cutting speed = 40 m/min.

Feed = 0.4 mm/rev.

Depth of cut = 2.5 mm/per pass

For thread cutting:

Cutting speed = 8 m/min.

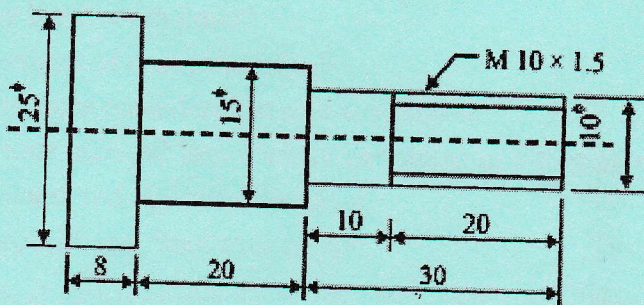


Figure 3

OR

- b) Find the time required on a shaper to machine a plate *13,K2,CO6*
600 mm x 1,200 mm, if the cutting speed is 15 meters/min. The ratio of return stroke time to cutting time is 2:3. The clearance at each end is 25 mm along the length and 15 mm on width. Two cuts are required, one roughing cut with cross feed of 2 mm per stroke and one finishing cut with feed of 1 mm per stroke.

PART - C (1 × 15 = 15 Marks)

16. a) Write briefly about the different methods of inspection followed in *15,K2,CO2* industries.

OR

- b) Explain the various types and sources of data required by the cost *15,K2,CO3* estimator.