



C14-M-503

4651

BOARD DIPLOMA EXAMINATION, (C-14)

MARCH/APRIL—2018

DME—FIFTH SEMESTER EXAMINATION

ESTIMATING AND COSTING

Time : 3 hours ]

[ Total Marks : 80

**PART—A**

3×10=30

- Instructions :** (1) Answer **all** questions.  
(2) Each question carries **three** marks.  
(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Differentiate between estimating and costing.
2. A machine was purchased for ₹ 11,00,000 and its life was estimated as 10 years. Its scrap value was ₹ 1,00,000. Find the value of the machine at the end of 5 years.
3. List out two examples for each of the following :
  - (a) Factory overheads
  - (b) Administrative overheads
  - (c) Selling overheads
4. Determine the volume of solid of revolution of circular fillet about X-X axis at a distance  $R$  from the centre of gravity.
5. Briefly explain the step-by-step procedure to calculate the weight of material for a given component.
6. Calculate the time required to face a workpiece of 30 mm diameter. The cutting speed is 30 m/min and feed is 0.25 mm/rev.
7. How do you estimate the cost of arc cutting?

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8. State the relationship between thickness of plate and size of the electrode in gas welding.
9. List out various forging losses.
10. List out the different costs that sum up the foundry cost.

**PART—B**

10×5=50

**Instructions :** (1) Answer any **five** questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. (a) Explain the functions of estimating. 5  
 (b) Differentiate between depreciation and obsolescence. 5
12. An electric fan is available in the market at a catalogue price of ₹ 1,500. The discount allowed to the distributor is 12 percent. Administrative and sales overheads are 80 percent of factory cost. The direct material cost, direct labour cost and factory overheads are in the ratio of 1 : 3 : 2 respectively. If the direct labour cost is ₹ 300, determine the company's profit on each item.
13. Estimate the weight and material cost of material utilised in the manufacture of a gear blank as shown in Fig. 1. Assume 20% of finished material to be lost in various machining processes. The density of material is 7.25 g/cm<sup>3</sup> and the cost of the material per kg is ₹ 30.

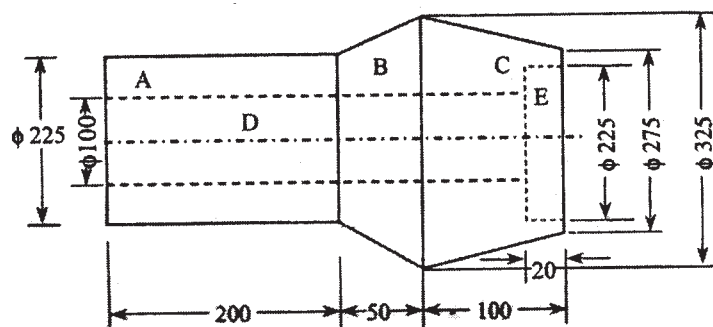


Fig. 1 (All dimensions are in mm)

14. Estimate the machining time to complete the job as shown in Fig. 2 from the raw material of 40 mm dia and 100 mm long.

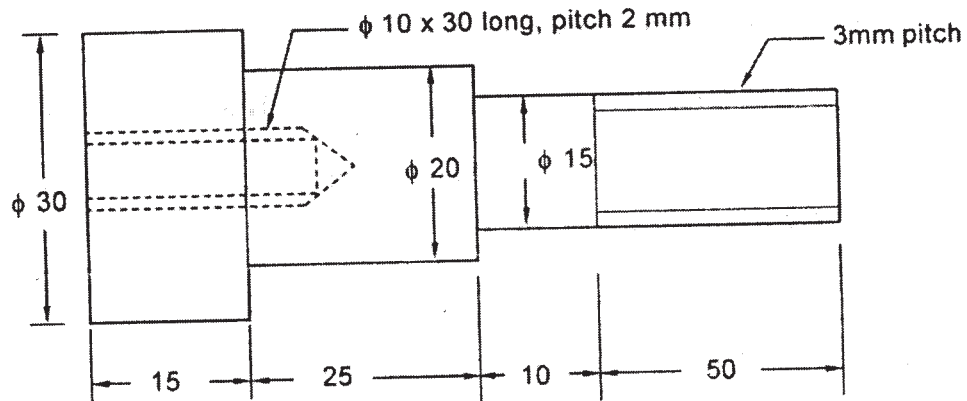


Fig. 2 (All dimensions are in mm)

Assume the following data :

Cutting speed for turning as 25 m/min, feed for turning as 1 mm/rev, depth of cut not exceed 2.5 mm, cutting speed for threading as 10 m/min and feed for drilling as 0.1 mm/rev.

15. (a) Mild steel shaft 30 cm long is to be rough ground from 43.3 mm dia to 43 mm dia using a grinding wheel of 40 mm face width. Calculate the time required to grind the job assuming work speed of 12 m/min and depth of cut 0.02 mm per pass. 5
- (b) Calculate the time required for drilling a component as shown in the Fig. 3. Cutting speed is assumed as 20/min and feed as 0.02 cm/rev. 5

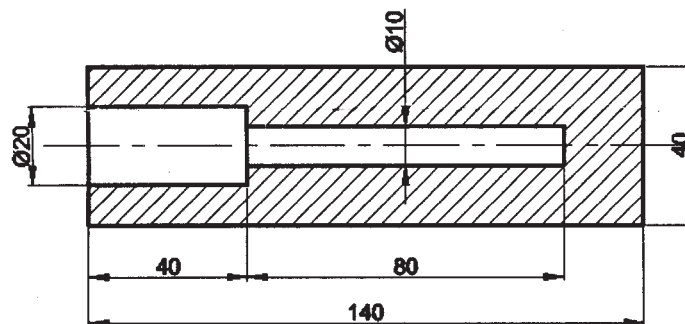


Fig. 3 (All dimensions are in mm)

16. Calculate the cost of welding two plates 200 mm × 100 mm × 8 mm thick to obtain a piece 200 mm × 200 mm × 8 mm approximately using rightward welding technique as shown in Fig. 4.

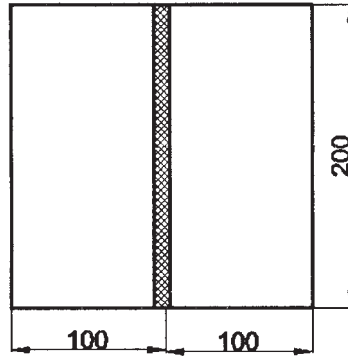


Fig. 4 (All dimensions are in mm)

The following data is available :

Cost of filler material	=	₹ 60.00/kg
Cost of oxygen	=	₹ 7.00/m <sup>3</sup>
Cost of acetylene	=	₹ 7.00/m <sup>3</sup>
Consumption of oxygen	=	0.70 m <sup>3</sup> /hour
Consumption of acetylene	=	0.70 m <sup>3</sup> /hour
Diameter of filler rod	=	4 mm
Density of filler material	=	7.2 grams/m <sup>3</sup>
Filler rod used per meter of weld	=	3.4 meter
Speed of welding	=	2.4 meter/hour

17. 250 pieces of a component as shown in Fig. 5 are to be drop forged from a 60 mm diameter bar stock. Calculate the cost of manufacturing if (a) material cost is ₹ 110 per meter length- (b) forging charges @ ₹ 0.05 per cm<sup>2</sup> of surface area to be forged and (c) on cost is 15% of material cost. Assume all possible forging losses.

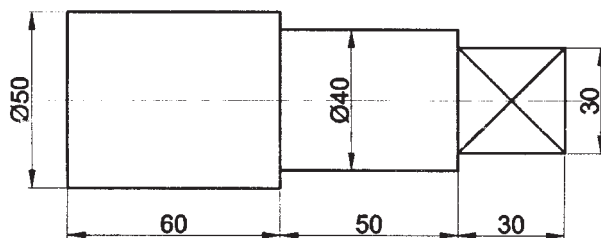


Fig. 5 (All dimensions are in mm)

18. Calculate the total cost of cast iron cap shown in Fig. 6, from the following data :

- Cost of molten iron at cupola spout = ₹ 30 per kg
- Process scrap = 17% of net wt of casting
- Process scrap return value = ₹ 5 per kg
- Administrative overhead charges = ₹ 2 per kg of metal poured
- Density of material used = 7.2 g/cc

The other expenditure details are :

Process	Time per piece	Labour charges per hour	Shop overheads per hour
Moulding and pouring	10 min	₹ 30	₹ 30
Casting removal, gate cutting, etc.	4 min	₹ 10	₹ 30
Fettling and inspection	6 min	₹ 10	₹ 30

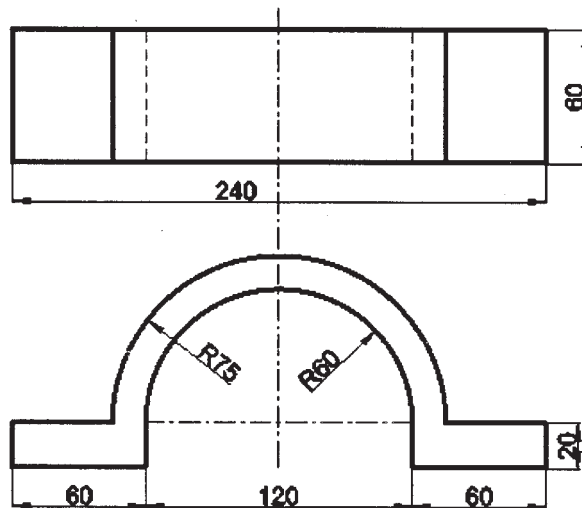


Fig. 6 (All dimensions are in mm)

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