C14–M–**503**

4651

BOARD DIPLOMA EXAMINATION, (C–14)

SEPTEMBER/OCTOBER - 2020

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. Compare estimation with costing.

2. What are various methods of calculating depreciation?

3. List out any 6 qualities of an estimator.

4. Calculate the volume of a regular hexagonal prism whose height is 100 mm and length of one side of hexagon is 30 mm.

5. Calculate the time required to face both ends of a rod of 5 cm in one cut. Take speed of rotation of job as 200 r.p.m. and cross feed as 0·3 mm/rev.

6. What is the necessity of estimating the machining time?

7. Draw the line diagram of leftward welding technique.

8. Write the difference between hand forging and machine forging.

9. How do you estimate the flash loss, if a bar of 100 mm length and 40 mm diameter is to be manufactured by drop forging? Calculate the surface area of that component also.

10. What is process scrap and fettling?

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PART—B   10×5=50

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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)* Describe the time allowances to be considered to estimate the time to complete an operation.

(b) Explain various causes of depreciation.

12. A small firm is producing 100 pens per day. The direct material cost is found to be ₹ 160, direct labour cost ₹ 200 and factory overheads chargeable to it ₹ 250. If the selling on cost is 40% of the factory cost, what must be the selling price of each pen to realize a profit of 14·6% of the selling price?

13. *(a)* Calculate the cost of making 150 CI castings as shown in Fig. 1. Density of CI may be taken as 7·2 gm/cc. The cost of CI material is ₹ 5 per kg. All dimensions are in mm :
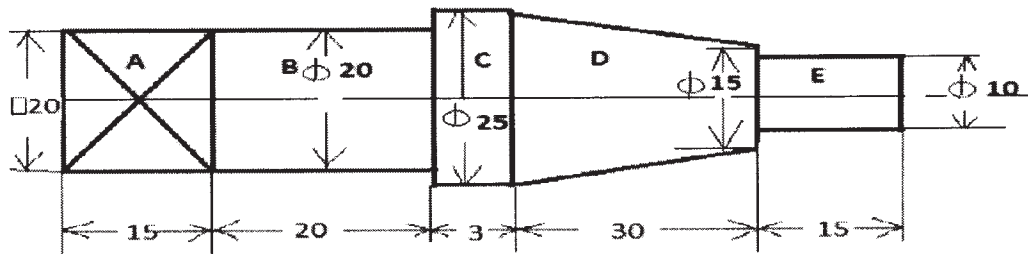

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Fig. 1

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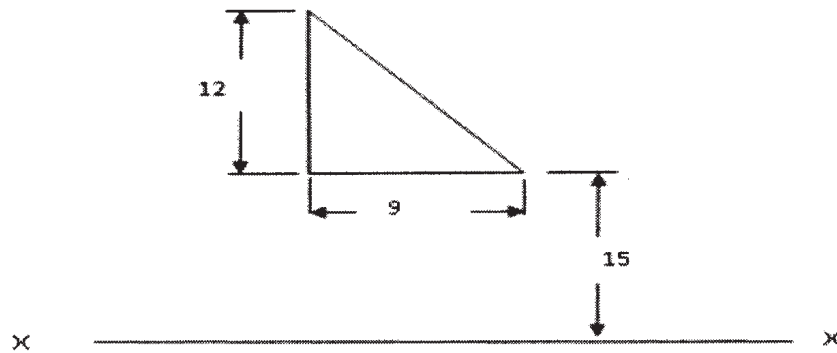*(b)* Determine the volume of solid of revolution of triangle about XX-axis as shown in Fig. 2 :

Fig. 2   7+3=10

14. Estimate the time taken to prepare a job from MS rod of diameter 4 cm and 6 cm long as shown in Fig. 3. Assume the following data :

Cutting speed for turning and boring operations—20 m/min

Cutting speed for drilling operation—30 m/min

Feed for turning and boring operation—0·02 cm/rev

Feed for drilling—0·023 cm/rev

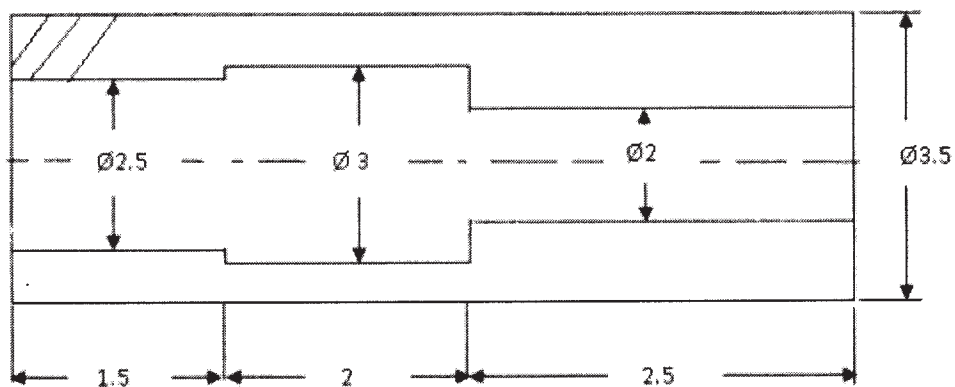Depth of cut not to exceed 3 mm in all operations

All dimensions are in cm.

Fig. 3

15. *(a)* Find the time for threading on 3 cm diameter spindle for a length of 15 cm. Number of threads to be cut is 3 per cm, the lathe runs with a speed of 88 r.p.m. Assuming materials to be mild steel and no. of cuts required for threading to be 7 cuts.

(b) A CI rectangular block of 10 cm × 3 cm is required to be shaped to reduce the thickness from 1·5 cm to 1·3 cm in one cut. Determine the time required for shaping, if cutting speed is 20 m/min and feed 0·2 cm/stroke and the cutting time ratio is 3/5.

(c) Calculate the time required to rough grind a steel shaft of 3 75 cm to 3 7 cm using grinding wheel of 5 mm face. Assume cutting speed 12 m/min and depth of cut 0·0025 cm. Length of shaft to be ground is 25 cm.

3+3+4=10

16. Estimate the welding cost for butt welding two mild steel plates each 300 mm × 200 mm × 4 mm. Assume the following data :

Consumption of oxygen = 0·55 m^3/hr

Rate of oxygen = ₹ 30/m^3

Consumption of acetylene = 0·27 m^3/hr

Rate of acetylene = ₹ 150/m^3

Welding time per meter of weld = 20 min

Length of filler rod consumed = 3·4 m/m of welding

Filler rod diameter = 3 mm

Filler material lost during welding = 20%

Density of filler rod = 7·2 gm/cc

Cost of filler rod = ₹ 45/kg

Welding is done on both sides.

17. *(a)* Explain the procedure for estimating the forging cost of a component.

(b) Calculate the length of regular hexagonal bar (side 10 mm), if it is forged from a square bar of 25 mm side and 200 mm long by considering scale loss only. 7+3=10

18. 100 bevel gear blanks are to be cast as per finished drawing shown in Fig. 4. Machine allowance 2 mm, allowed in the pattern on each side. Consider machining allowance only. Calculate the selling price of one gear blank. Pattern is supplied by customer. Use the following details :

Cost of CI = ₹ 10/kg, Melting charge = 15% of material cost, Moulding charge = ₹ 2 per mould.

Fig. 4

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