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C14–M–503

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BOARD DIPLOMA EXAMINATION, (C–14)

OCT/NOV—2017

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. State the functions of cost estimation.

2. State the importance of costing.

3. List out any three causes of depreciation and give example for each of the cause.

4. Write the formula for finding the volume of the following :
(a) Frustum of cone
(b) Circular ring
(c) Sphere

5. List out the steps involved in finding out the cost of the material.

6. Estimate the time required to machine 15 cm 15 cm face of job on the shaper in a single cut. Assume the feed as 0·7 mm/stroke and cutting speed as 10 m/min.

7. Mention the various elements involved in calculating the fabrication cost of a product.

8. Briefly explain the procedure to compute the power charges in arc welding.

9. List out any three losses in forging operation.

10. Give any three examples for foundry overheads.

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)* List out the various constituents of estimating the cost of a product.

(b) Explain briefly the factory overheads. 5+5

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. Calculate the weight of the component shown in Fig. 1. Density of the material may be taken as 8 grams/cm^3 :

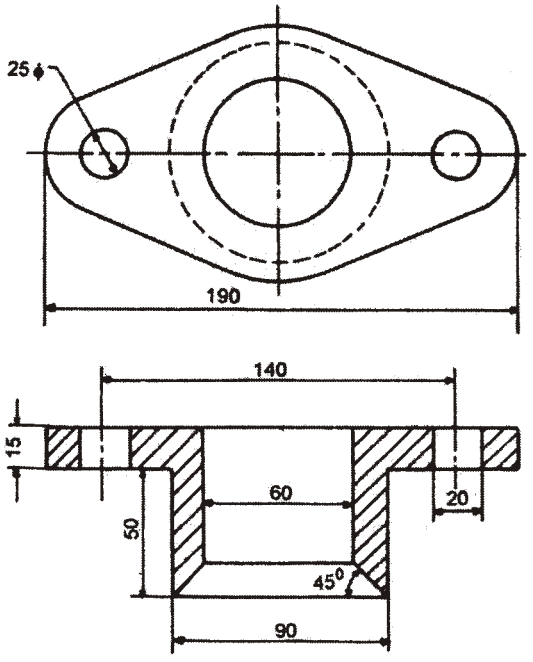

Fig.1.(All dimensions are in mm)

14. A mild steel shaft, shown in Fig. 2 is to be turned from a 24-mm dia bar. The complete machining consists of the following steps :

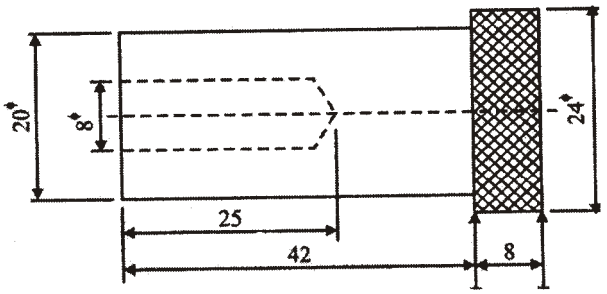

Fig.2.(All dimensions are in mm)

(a) Facing 24 mm dia on both side

(b) Turning to 20 mm dia

(c) Drilling 8 mm dia hole

(d) Knurling

With HSS tool, the cutting speed is 60 m/min. The feed for longitudinal machining is 0·3 mm/rev. The feed for facing 0·2 mm/rev, feed for knurling 0·3 mm/rev and feed for drilling is 0·08 mm/rev. Depth of cut should not exceed 2·5 min in any operation. Find the machining time to finish the job.

15. *(a)* Define the following terms :

(i) Cutting speed

(ii) Feed

(iii) Depth of cut

(b) Find the time required to produce 8 holes on a costing each of 10 cm depth, if the hole dia is 2 cm. Cutting speed is taken as 20 m/min and feed as 0·02 cm/rev.

16. Calculate the cost of welding two pieces of mild steel sheets 1 metre long and 7 mm thick. A 60 V is prepared by means of gas cutting before welding is to be commenced. The cost of oxygen is ₹ 7·00/m^3 and of acetylene is ₹ 4·00/m^3. The filler metal cost ₹ 20/kg.

The relevant data as follows :

For gas cutting (for 10 mm thick plate) :

Cutting speed—20 m/hr

Consumption of oxygen—2·0 m^3/hour

Consumption of acetylene—0·2 m^3/hour

Data for rightward welding (for 7 m thick plate) :

Consumption of oxygen—0·8 m^3/hour

Consumption of acetylene—0·8 m^3/hour

Diameter of filler rod used—3·5 mm

Filler rod used per metre weld—3·4 m

Rate of welding—3 metres/hour

Density of filler metal—8 gram/cm^3

17. 150 pieces of shafts as shown in Fig. 3 are to be drop forged from the raw stock of 20 mm diameter :

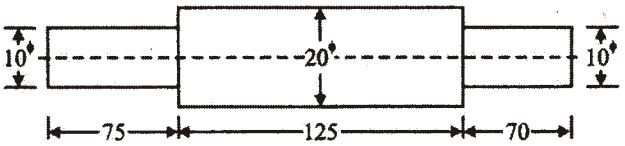

Fig. 3 (All dimensions are in mm)

Estimate the cost incurred if—

(a) the material cost is ₹ 5·20 m;

(b) the cost of forging is ₹ 120·50 m^2 of surface area to be forged;

(c) the overhead expenses is to be 100% of the cost of the forging;

(d) the consider all possible forging losses.

18. A cast iron component is to be manufactured as per Fig. 4. Estimate the selling price per piece from the following data :

Density of material—7·2 gm/cc
Cost of molten metal at cupola spout—₹ 20 per kg
Process scrap—20% of net weight
Scrap return value—₹ 6 per kg
Administrative overheads—₹ 30 per hour
Sales overheads—20% of factory cost
Profit—20% of factory cost

Other expenses are as shown in the following table :

Operation	*Time* (in min)	*Labour cost* (in ₹/hour)	*Shop overheads* (in ₹/hour)
Moulding and pouring	15	20	60
Shot blasting	5	10	40
Fettling	6	10	40

The component shown is obtained after machining the casting. The pattern which costs ₹ 5,000 can produce 1000 pieces before being scrapped. The machining allowance is to be taken as 2 mm on each side.

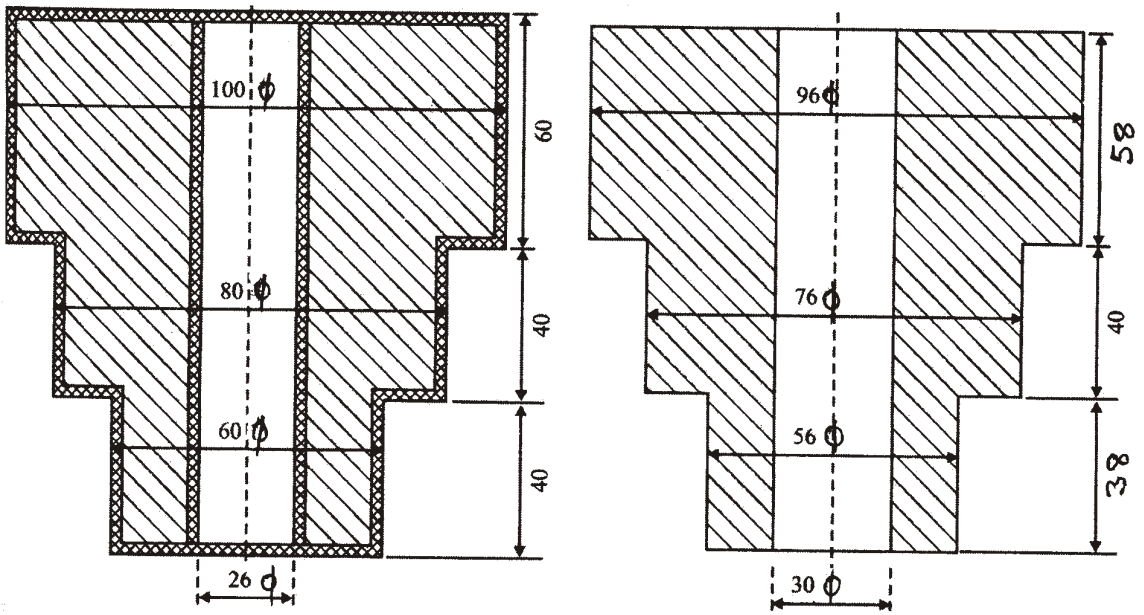

Fig. 4 *(a)* Component as cast and *(b)* Finished component

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