DEPARTMENT OF MECHANICAL ENGINEERING

Sub. Code/Name: ME6005 -Process Planning & Cost Estimation Year/Sem: IV/VII

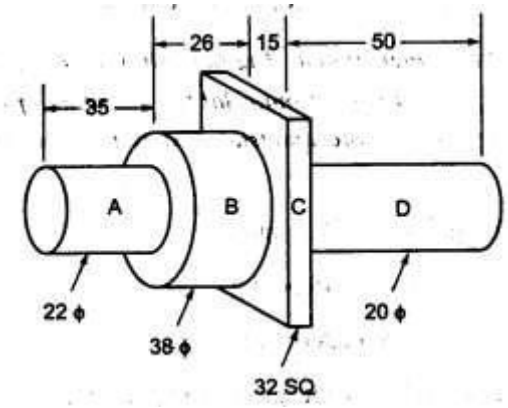
QUESTION BANK

UNIT-V PRODUCTION COST ESTIMATION Part-A (2 Marks)

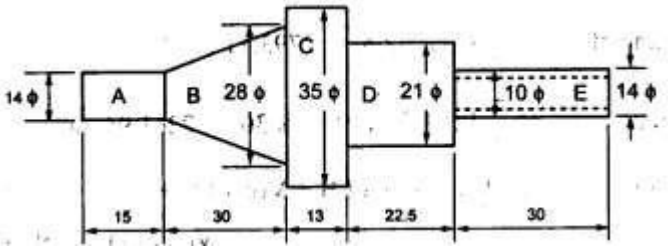
1. Define forging.
2. How will you determine materials cost.
3. Define percentage of overheads.
4. Define machine hour rate.
5. What is sprue loss?
6. What is flash loss?
7. What is tonghold loss?
8. What is shear loss?
9. How will you calculate net weight of the casting?
10. What is meant by machining time?
11. Differentiate hot forging and cold forging.
12. Contrast smith forging and drop forging.
13. In what ways, press forging and upset forging are different?
14. Define man hour and machine hour rate.
15. Distinguish between feed and depth of cut.
16. What is unit rate?
17. What is scale loss?
18. What are the types of welding?
19. What is the pattern?
20. What is shrinkage allowance?

Part-B (16 Marks)

1. An isometric view of a work piece is shown in figure. What will be the weight of the material required to produce it. The density of material is 2.681 gm/cc. Find also the material cost if its rate is Rs.13.60 per kg. All dimensions are in mm. , (16)



2. Estimate the weight of material required for manufacturing 220 pieces of shaft as shown in figure. The shafts are made of mild steel which weighs 7.87 gm/cm3 and costs Rs.4.25 per kg. Also calculate the material cost for 220 such shafts. (16)



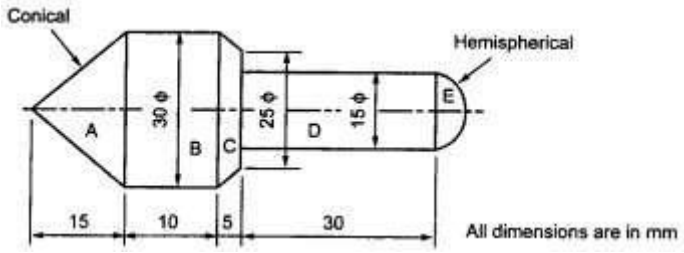
3. For manufacturing a 'milling machine', the expenditure is tabulated in table. (16)

S.No.	Particulars	Expenses in Rupees
1.	Material consumed	46,000
2.	Indirect factory wages	7,000
3.	Director's fees	2,500
4.	Advertising	8,000
5.	Net profit	11,750
6.	Depreciation on sales department's car	900
7.	Printing and stationery	350
8.	Depreciation on plant	4,200
9.	Direct wages	59,000
10.	Factory rent	5,750
11.	Telephone and postal charges	250
12.	Gas and electricity	400
13.	Office salaries	2,000
14.	Office rent	600
15.	Showroom rent	1,200
16.	Salesman's commission	1,850
17.	Sales department car expenses	1,200

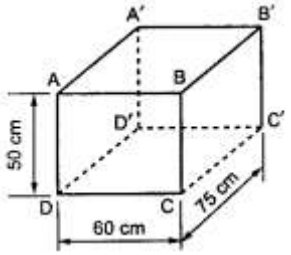
Find out (a) Prime cost, (b) Factory cost, (c) Total cost of production, (d) Cost of sales, and (e) Selling price.

4. Two workers complete 20 connecting rods, each weighing 3.5 kg by forging per day. They are paid at the rate of Rs.16 and Rs.14 per day respectively. If the material cost is Rs.7.25/kg and 60% of the direct labour is required to compensate for the factory overheads, estimate the total cost of each rod. (16)

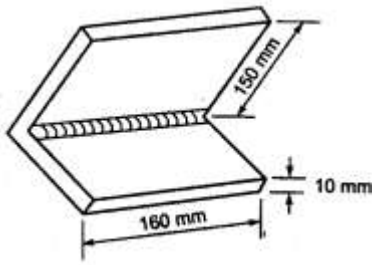
5. A steel component shown in figure is to be drop forged in close impression dies. Estimate the gross weight of the component. The various losses account for 26 % of net weight. Take density as 7.7 gm/cc. (16)



6. An open water tank of size 75 cm X 60 cm X 50 cm is made by gas welding from a 4 mm thick metallic sheet. Estimate the time required for welding a tank. Neglect other factors. (16)



7. Estimate the material cost for welding 2 flat pieces of M.S. 15 X 16 1 cm size at an angle of 90° by gas welding Neglect edge preparation cost and assume: Cost O2 = Rs. 10/m3 Cost of C2 H2 = Rs.. 60/m2 Density of filler metal = 7 gm/cc Cost of filler metal = Rs. 12/kg filler rod dia = 5 mm filler rod required 4.5 m/m of welding assume O2 consumption = 0.7 cu.m/hr. C2H2 consumption = 0.5 cu.m/hr. Welding time = 30 min/m of welding. (16)



8. 20 numbers of gun metal bevel gear blank shown in figure are to be cast in the factory from the planner supplied by the customer Estimate the selling price of each piece from the following data.

(i) Cost of molten gun metal= Rs.9.20 per kg. (3)

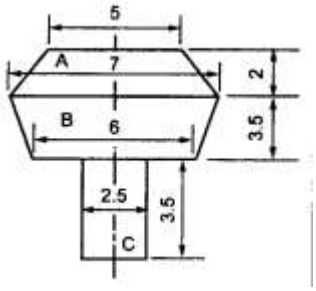
(ii) Scrap return value = Rs.s 5.00 per kg. (3)

(iii) Process scrap = 10 % net weight of casting (3).

(iv) Administrative overheads=Rs.3.50 per kg (3).

(v) Profit=15% of manufacturing cost. (2)

(vi) Density of gun metal = 8.73 gm/cc .(2)



9. An engine flywheel is required to be cast according to drawing shown in figure (16)

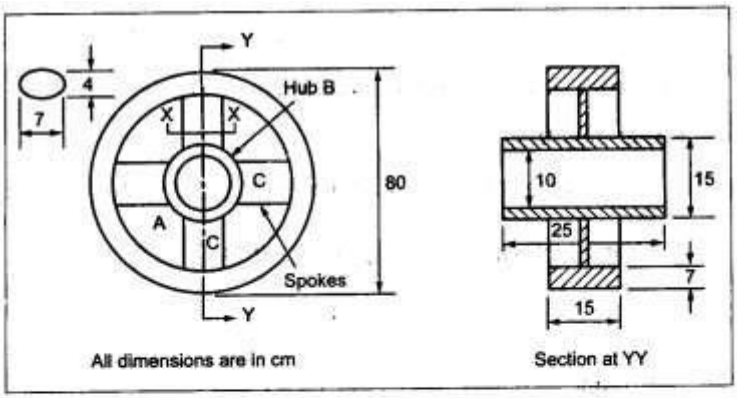


Fig. 10.5.

(a) Estimate the net weight of the flywheel casting.

(b) Estimate the selling price of each wheel, given the following data :

(i) Cost of pattern = Rs. 75 per 500 castings;

(ii) Process scrap = 11% of net weight;

(iii) Scrap return value = Rs. 0.70 per kg;

(iv) Cost of molten metal at furnace spout = Rs. 2 per kg;

(v) Administrative overheads = Rs. 6 per hour;

(vi) Selling overheads = 25% of production cost;

(vii) Profit = 15% of total cost;

(viii) Density = 7.2 gm/cc.

Other expenditure detail are :

Unit operation	Time per piece	Labour rate/hour	Shop overheads/hour
Moulding	12 min	Rs. 2.75	Rs. 4.50
Pouring	6 min	Rs. 2.50	Rs. 3.50
Shot blasting	5 min	Rs. 2.60	Rs. 4.00
Fettling	6 min	Rs. 2.40	Rs. 3.25

10. A C.I. factory employees 25 persons It consumes material worth Rs. 35,000 pays workers at the rate of Rs. 5 per hour and incurs total overheads of Rs.20,000. In a particular month (25 days) workers and an overtime of 150 hours and were paid double than the normal rate. Find

    (i) The total cost, and (8)

    (ii) The man hour rate of overheads. Assume 8 hours working days.