

VALLIAMMAI ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING

Sub. Code/Name: ME2027-Process Planning & Cost Estimation Year/Sem: IV/VII

QUESTION BANK

UNIT-I WORKSTUDY AND ERGONOMICS

Part-A (2 Marks)

1. What is meant by Work Study?
2. Mention few application of work study
3. What is meant by Method Study?
4. What is Process Charts?
5. What are the various symbols of process chart?
6. Explain outline process chart.
7. Explain two hand process chart.
8. What is SIMO Charts?
9. What is multiple activity charts?
10. What are therbligs?
11. Where string diagram is used?
12. What is travel chart?
13. What is meant by work measurement?
14. What are the techniques of work measurement?
15. Define performance rating?
16. What is allowance?
17. What do you mean by standard time?
18. How do you calculate the standard time?
19. What is meant by ergonomics?
20. State some application of ergonomics?

Part-B (16 Marks)

1. Define the terms 'work study', 'method study' and 'work measurement'. Also briefly explain how use of work study leads to higher productivity in a manufacturing unit.
2. What are the various symbols of process chart? Write and explain briefly.

3. Explain the significance, construction and applications of the following recording techniques:
 - (i) Outline process chart
 - (ii) Flow process chart
 - (iii) Two handed process chart; and
 - (iv) Multiple activity charts.
4. Differentiate between
 - (i) Cyclograph and chronocyclegraph
 - (ii) Travel chart and string diagram
 - (iii) Flow process chart and flow diagram
5. What are therbligs? Give any five therbligs with symbols
6. List the principles of motion economy as applied to:
 - (i) The use of human body,
 - (ii) Arrangement of work place, and
 - (iii) Design of tool and equipment
7. Define work measurement and state its objectives.
8. Briefly explain the various techniques of work measurement.
9. Define time study List down the various steps in conducting a stop watch time study.
10. What is meant by ergonomics? Describe the objectives of the study of ergonomics.

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UNIT-II PROCESS PLANNING

Part-A (2 Marks)

1. What is meant by process planning?
2. Define technology view of process planning.
3. What are the activates associated with process chart?
4. What are the factors affect process planning?
5. List any four information required for process planning.
6. What are factors that influence process planning?
7. What are the reasons for process documentation?
8. State the general approaches to process planning?
9. What is manual process planning?
10. What are the advantages of manual process planning?
11. What are the disadvantages of manual process planning?
12. What is CAPP?
13. What are the advantages of CAPP?
14. What is Flow Chart?
15. List any two advantages and limitations of flow and Decision charts?
16. Explain process planning activates.
17. What are the disadvantages of flow charts?
18. What is decision table?
19. State the benefits of decision table?
20. What are the tools for acquiring documentation knowledge?

Part-B (16 Marks)

1. Explain the technological framework of process by using a block diagram. (16)
2. List the information required for process planning. (16)
3. What are the factors that influence process planning? (16)
4. Explain in detail the process planning activities. (16)
5. Explain the manual approach to process planning. (8)
What are advantages and limitations? (8)

6. (i) What is meant by CAPP? (4)
(ii) List out the benefits of CAPP systems. (12)
7. Explain the two approaches commonly used in CAPP system bringing out their advantages and limitations. (16)
8. Compare and contrast the features of variant and generative CAPP systems. (16)
9. Write short notes on 'tools for developing manufacturing logic and knowledge'.
10. What are the advantages and limitations of using?
 - (i) Flow charts (8)
 - (ii) Decision tables (8)

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UNIT-III INTRODUCTION TO COST ESTIMATION

Part-A (2 Marks)

1. Define Cost Estimation
2. List any four importance of cost estimation.
3. List any two objectives of cost estimation.
4. What are the functions of cost estimation?
5. What is final cost estimation?
6. What is preliminary estimation?
7. What are the components of job estimate?
8. What is drafting cost?
9. What is inspection cost?
10. State the importance of cost accounting.
11. What are the types of Estimation?
12. What are the methods of Estimation?
13. State the importance of realistic estimates.
14. What is design cost?
15. What is labour cost?
16. What do you mean by overhead cost?
17. Define costing.
18. What are the methods of costing?
19. What is direct cost?

Part-B (16 Marks)

1. (i)What is cost estimating? (8)
(ii)State the objectives of cost estimating. (8)
2. List the functions of estimating. (16)
3. Explain the type of cost estimates, which are used in estimating. (16)
4. List the various data required to make a cost estimate (16).
5. List the various types and sources of data required by the cost estimator. (16).

6. (i) What do you mean by a realistic estimate? (8)
(ii) Describe its importance in production. (8)
7. Explain the procedure followed for estimating the cost of an industrial product. (16).
8. (i) Define costing or cost accounting (6)
(ii) Why costing is essential to industrial control? (12).
9. (i) What is the purpose of costing? (8)
(ii) Differentiate between estimating and costing. (8)
10. Explain the various methods of costing. (16).

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UNIT-IV COST ESTIMATION

Part-A (2 Marks)

1. What are the elements of cost?
2. What are the types of cost?
3. What is meant by direct material?
4. What are the types of direct material?
5. State some examples for direct material.
6. What is meant by indirect material?
7. Who are called direct labour?
8. State some examples for direct labour?
9. What are factory expenses?
10. What are administrative expenses?
11. What are distribution expenses?
12. Who are called indirect labour?
13. What is meant by factory on cost?
14. Defining selling expenses.
15. What is total cost?
16. What is prime cost?
17. What is meant by office cost?
18. List various components of cost.
19. Give any two examples of distribution expenses.
20. What is ladder of cost?

Part-B (16 Marks)

1. (i) Name the various elements of cost. (8)
(ii) Explain each element in detail giving suitable examples. (8)
2. Contrast between direct materials and indirect materials. (8)
(ii) What do you understand by the term 'overhead expenses'? List few items of overhead expenses in a factory. (8)
3. What items of expenditure are included in administrative overheads? (16)

4. Describe in brief:
 - (i) Selling expenses, (8)
 - (ii) Distribution expenses. (8)
5. List various components of cost (16)
6. Explain the terms prime cost, factory cost, total cost and selling price. Show the relationship between various components of cost with the help of a block diagram.
7. Briefly explain all the factors to be considered while calculating the time required for a particular job. (16)
8. Define the following terms:
 - (i) Set up time, (4)
 - (ii) Handling time, (4)
 - (iii) Machining time, and, (4)
 - (iv) Tear down time. ,(4)
9. What are the various time allowances which should be considered for calculating labour cost?
10. Under what situations, you can use the allocation of overhead expenses by percentage on prime cost method.

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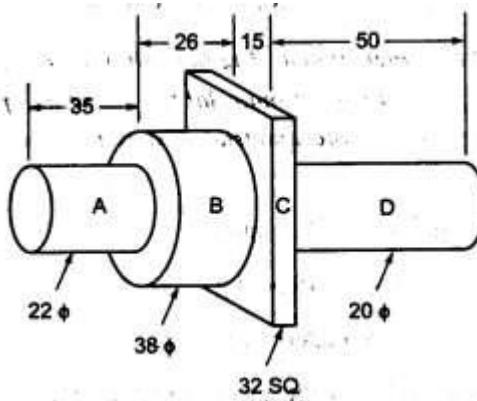
UNIT-V-PRODUCTION COST ESTIMATION

Part-A (2 Marks)

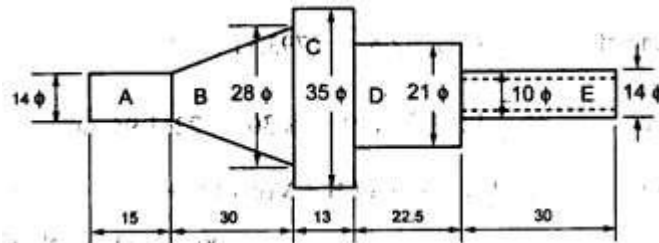
1. Define forging.
2. How will you determine materials cost.
3. Define percentage of overheads.
4. Define machine hour rate.
5. What is sprue loss?
6. What is flash loss?
7. What is tonghold loss?
8. What is shear loss?
9. How will you calculate net weight of the casting?
10. What is meant by machining 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)

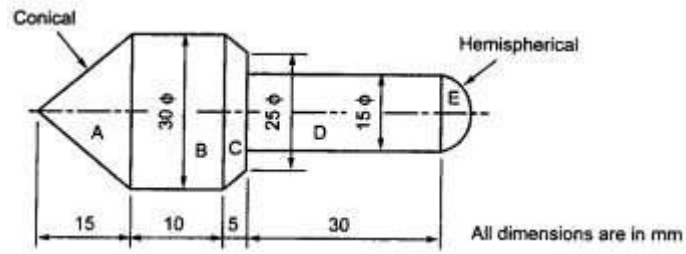


3. For manufacturing a 'milling machine', the expenditure is tabulated in table. (16)

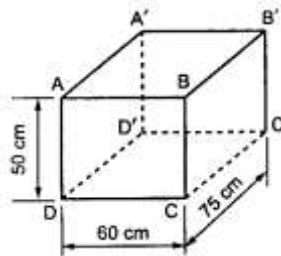
S.No.	Particulars	Expenses in Rupees
1.	Material consumed	46,000
2.	Indirect factory wages	7,000
3.	Director's fees	2,500
4.	Advertising	8,000
5.	Net profit	11,750
6.	Depreciation on sales department's car	900
7.	Printing and stationery	350
8.	Depreciation on plant	4,200
9.	Direct wages	59,000
10.	Factory 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.

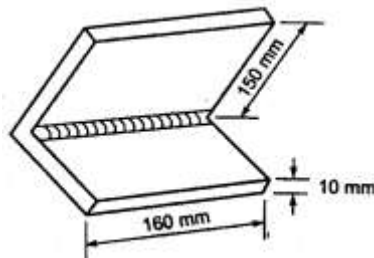
4. Two workers complete 20 connecting rods, each weighing 3.5 kg by forging per day. They are paid at the rate of Rs.16 and Rs.14 per day respectively. If the material cost is Rs.7.25/kg and 60% of the direct labour is required to compensate for the factory overheads, estimate the total cost of each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

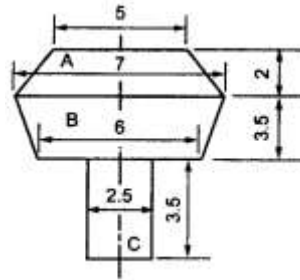


7. Estimate the material cost for welding 2 flat pieces of M.S. 15 X 16 1 cm size at an angle of 90° by gas welding Neglect edge preparation cost and assume: Cost O₂ = Rs. 10/m³ Cost of C₂ H₂ = Rs. 60/m³ Density of filler metal = 7 gm/cc Cost of filler metal = Rs. 12/kg filler rod dia = 5 mm filler rod 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)

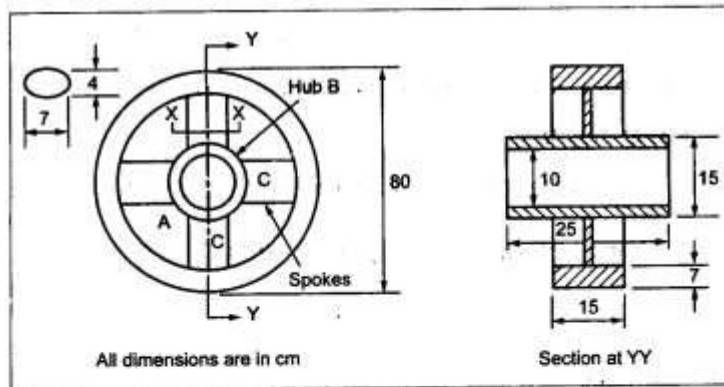


Fig. 10.5.

- (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.