A 1400

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2007.

Seventh Semester

Mechanical Engineering

MF 441 — PROCESS PLANNING AND COST ESTIMATION

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define standardization.

2. What is Break Even Analysis?

3. What are the aims of costing?

4. Define Estimation.

5. List out the different components of Cost.

6. What are the factory expenses?

7. What are the losses in forging?

8. What are the Different types of labour cost involved in welding?

9. Define standard time. Write formula for standard time.

10. What are the different types of milling operations?

PART B — (5 × 16 = 80 marks)

11. (a) (i) What is the scope of process planning? (6)

(ii) Explain process planning for parts and process planning for assemblies. (10)

Or

(b) (i) What are the benefits of computer aided process planning? (6)

(ii) List out the types of computer aided process planning. Explain. (10)

12. (a) (i) Describe the various cost involved in the estimating procedure. (8)

(ii) What are the functions of estimating? (4)

(iii) Differentiate costing and estimation. (4)

Or

(b) (i) What is the aims of estimating? (4)

(ii) What is the importance of costing? (2)

(iii) Describe the detail procedure of estimating. (10)

13. (a) A firm producing air circulator wants to place an improved design in the market. Suggest a selling price covering the on cost and keeping the previous profit proportions on sales. The materials in new model will cost Rs. 350 and the direct wages would be Rs. 200. The following figures relate to the previous year. (16)

Stock of material on 1st April 1976 = Rs. 25,000

Stock of material on 31st March 1975 = Rs. 27,000

Purchase of raw materials in this period = Rs. 50,000

Manufacturing wages = Rs. 15,000

Works on cost = Rs. 7,500

Administrative and sales on cost = 7,500.

Sales during the year = Rs. 95,000

Or

(b) In a production concern the variable overhead charges are Rs. 2.00 per article and the fixed overhead charges per month are Rs. 35,000. It is estimated that 65,000 articles are produced each month under normal conditions Find :

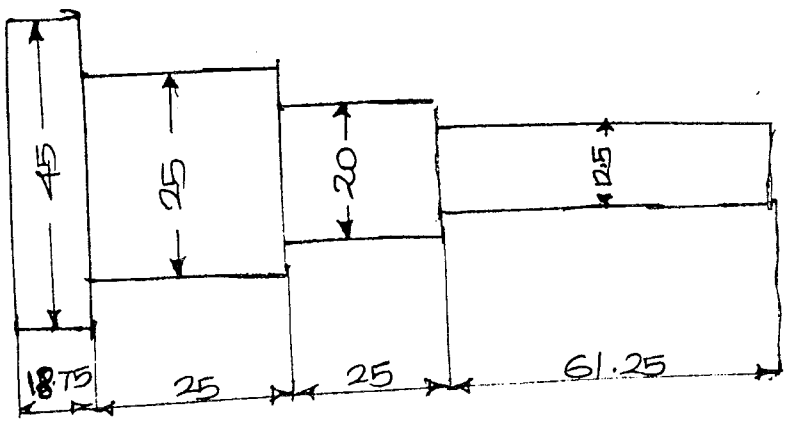
(i) The normal overhead cost per article.

(ii) If the factory cost drops to 85% production. The overhead charges that are unrecovered.

(iii) If the production is increased to 130% by what amount these charges will be over recovered. (16)

14. (a) 1000 stepped bolts of size shown in Fig. are to be made by machine forging. Estimate net weight, gross weight and number of bars required. If m.s bars are available in 5 metre length and 20 mm diameter. Take the density of m.s bar 7.868 gm/cm^3. (16)

ALL DIM IN MM.



Or

(b) (i) What is the material cost of welding two plates of size 300 mm length and 150 mm with 8 mm thickness to make a piece 300 × 300 mm approximately? Use rightward technique with no edge, preparation costs. Take over all cost of oxygen as Rs. 0.70 per cu.meter, cost of acetylene at Rs. 7.00 per cu.metre, cost of filler metal Rs. 2.50 per kg. and 1 cu.cm of filler metal weighs 11.28 gms. Assume weld as rightward. (12)

(ii) A lap joint is to be prepared in 9.5 mm. M.S. steel sheet using flat welding position and 6 mm electrode. Current used is 250 amps and 30 volts. Welding speed is 12 m/hr. and 0.3 kg of metal is deposited per metre length of joint.

Labour costs Rs. 1.50/hr, power Rs. 0.2/KWH and electrode Rs. 4/kg. Efficiency of machine is 50% and operating factor is 60%. Calculate the cost of labour, power and electrode per metre of weld. (4)

15. (a) (i) Estimate the time taken to prepare a job as shown in fig. From mild steel stock bar 4.00 cm in diameter and 7.5 cm long. Assume the following data. (12)

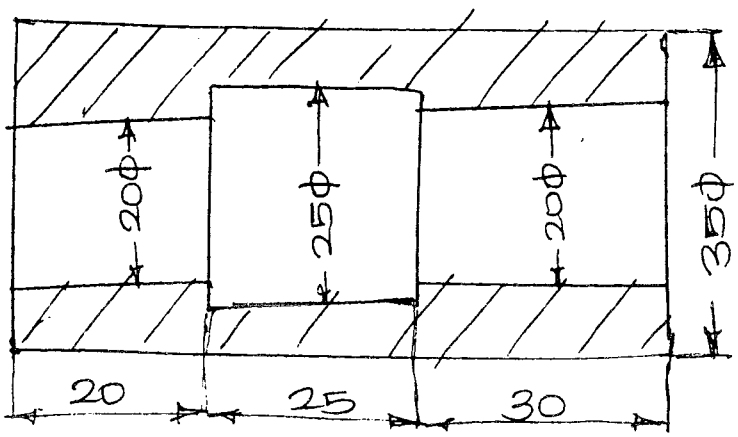
Cutting speed for turning and boring operations = 20 m/min

Cutting speed for drilling operations = 30 m/min.

Feed for turning and boring operation = 0.2 mm/rev.

Feed for 20 mm drill = 0.23 mm/rev.

Depth of cut not to exceed 3 mm in any operation.



ALL DIMENSIONS IN MM.

(ii) Estimate the time required for tapping a hole with 2 cm diameter tap (3 mm pitch) to a depth of 5 cm in mild steel. The return speed of the tap is to be 3 times the cutting speed which is to be 10 metres per minute. (4)

Or

(b) (i) A cast iron block of size 20 cm × 7.5 cm is required to be shaped to reduce the thickness from 2 cm to 1.8 cm in one cut. Determine the time required for shapping if cutting speed is 20 m/min. and feed is 0.2 mm per stroke and the cutting time ratio is 3/5. (8)

(ii) Calculate the time required to rough grind a steel shaft of 3.75 cm diameter to 3.7 cm diameter size using a grinding wheel of 5 cm face and assuming a cutting speed of 12 metre/minute and depth of cut 0.0025 cm. Length of shaft to be ground is 25 cm. (8)