

21 APR 2023

Reg. No.

Question Paper Code

11788

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL/MAY 2023

Eighth Semester

**Mechanical Engineering**

(Common to Production Engineering)

**ME8793 - PROCESS PLANNING AND COST ESTIMATION**

(Regulations 2017)

Duration: 3 Hours

Max. Marks: 100

**PART - A (10 × 2 = 20 Marks)**

Answer ALL Questions

- |   | <i>Marks,<br/>K-Level, CO</i> |
|---|-------------------------------|
| 1. What are the process planning methods?                               | 2,K1,CO1                      |
| 2. Discuss the various parameters considered in the material selection. | 2,K1,CO1                      |
| 3. What is meant by break-even point?                                   | 2,K1,CO2                      |
| 4. Distinguish between jigs and fixtures.                               | 2,K2,CO2                      |
| 5. What are the functions of cost estimation?                           | 2,K1,CO3                      |
| 6. Define Fatigue allowances.   | 2,K1,CO3                      |
| 7. What are the different types of forging operations?                  | 2,K1,CO4                      |
| 8. State any four pattern allowances.                                   | 2,K1,CO4                      |
| 9. What is meant by over travel?  | 2,K1,CO5                      |
| 10. Distinguish between feed and depth of cut.                          | 2,K2,CO5                      |

**PART - B (5 × 13 = 65 Marks)**

Answer ALL Questions

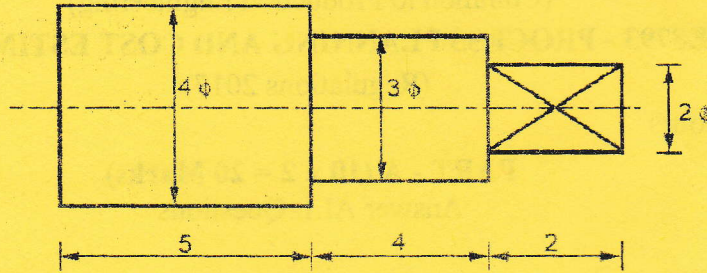
11. a) Explain the procedure involved in the product design with suitable flowchart. 13,K2,CO1
- OR**
- b) Explain the various material selection methods. 13,K2,CO1
12. a) Explain the various factors to be considered for selection of measuring instruments. 13,K2,CO2
- OR**
- b) Explain the set of documents required for Process Planning. 13,K2,CO2
13. a) Explain the various allowances in estimation with suitable justification. 13,K2,CO3
- OR**
- b) Write down the step by step procedure for estimating the direct materials cost and labour cost. 13,K2,CO3

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

**11788**

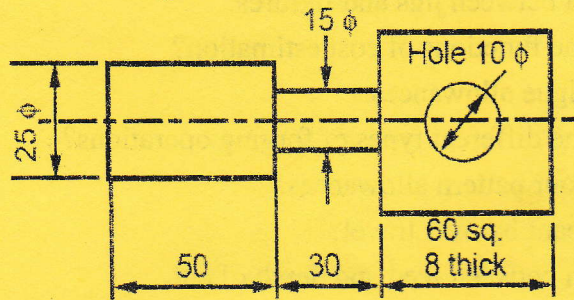


14. a) 200 pieces of a component as shown in Fig. are to be drop forged from a 4 cm diameter stock bar. Calculate the cost of manufacture, if 13,K2,CO4
- (i) Material cost is Rs 500 per meter.
  - (ii) Forging charges @ 1000/m<sup>2</sup> of surface area to be forged.
  - (iii) On cost is 10% of material cost. Consider all possible losses during operations. All dimensions are in cm.



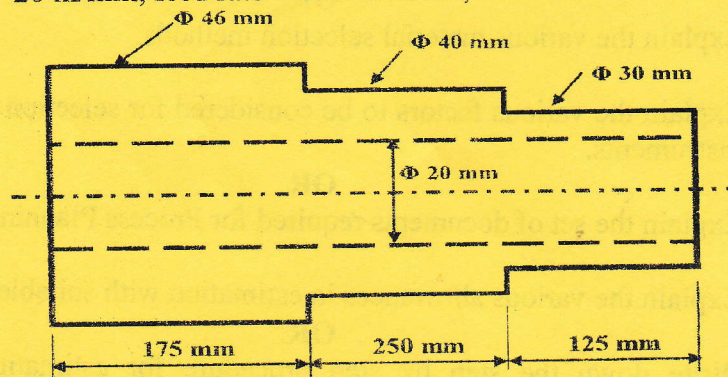
OR

- b) Calculate the net weight and gross weight for the manufacture of 500 levers shown in Fig. The material weighs 7.8 gm/cc and total losses account for 25 % of net weight of the lever. 13,K2,CO4



All dimension are in mm

15. a) A bush as shown in Fig. is to be prepared from a bar stock of diameter 46 mm and length 550 mm. Determine the machining time if Cutting Speed = 20 m/min; feed rate = 0.15 mm/rev; 13,K2,CO5



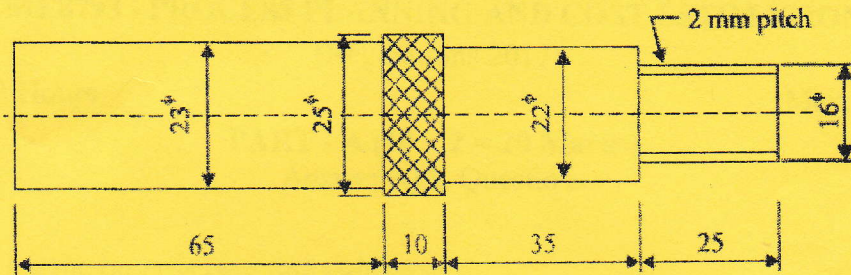
OR



- b) Estimate the machining time required for manufacturing a shaft shown in Fig. from a M.S stock of 26 mm dia. All dimensions are in mm 13, K2, CO5

Assume:

- (a) Feed for turning operations = 0.2 mm/rev.
- (b) Cutting speed for turning and knurling operations = 20 m/min.
- (c) Cutting speed for threading = 12 m/min.
- (d) Depth of cut not to exceed = 3 mm.
- (e) No. of cuts for threading = 5



**PART - C (1 × 15 = 15 Marks)**

16. a) Find the time required on a shaper to machine a plate 600 mm x 1,200 mm, if the cutting speed is 15 meters/min. The ratio of return stroke time to cutting time is 2:3. The clearance at each end is 25 mm along the length and 15 mm on width. Two cuts are required, one roughing cut with cross feed of 2 mm per stroke and one finishing cut with feed of 1 mm per stroke. 15, K3, CO6

**OR**

- b) Estimate the grinding time to finish a shaft from 38.5 mm to 30 mm diameter. Length of shaft as 300 mm. Assume the following data: 15, K3, CO6  
 Width of grinding wheel = 50 mm; Depth of cut in roughening operation = 0.785 mm; Depth of cut in finishing operation = 0.05 mm; Cutting speed = 12 m/min. Assume 1 mm on diameter to be finished ground and remaining rough ground.