Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : X10713

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020
AND APRIL/MAY 2021
Seventh/Eighth Semester
Mechanical Engineering
ME 8793 – PROCESS PLANNING AND COST ESTIMATION
(Common to Materials Science and Engineering, Mechatronics Engineering,
Mechanical and Automation Engineering, and Robotics and automation
/production Engineering/manufacturing Engineering)
(Regulation 2017)

Time : Three Hours   Maximum : 100 Marks

Answer ALL questions.
PART – A   (10×2=20 Marks)

1. Write short notes on collective-single part drawing.

2. Differentiate between continuous cutting and intermittent cutting with an example.

3. In a turning process, the length of work piece is 80 mm, feed is 0.5 mm/rev. and cutting speed is 500 rpm. Calculate the time required for the cutting operation.

4. In a manufacturing industry, the fixed cost for a particular year is Rs. 2,50,000. The variable cost is Rs. 15 per unit. The selling price of the component is Rs. 40. Calculate the value of break-even quantity.

5. Brief on cost accounting.

6. What do you mean by depreciation ?

7. In hot working process, surface finish is not good. Justify this statement.

8. List out few examples for indirect material cost in casting.

9. Define approach length in turning process.

10. Which operation is done to provide gripping in metal handles ?

PART – B **(5×13=65 Marks)**

11. a) Explain in detail about the retrieval type CAPP system.

   (OR)

   b) Enlist the technical factors to be considered for machine selection and explain them in short.

12. a) Discuss about the principles of jigs and fixtures design.

   (OR)

   b) List out the set of documents required for process planning.

13. a) Briefly explain the various elements of cost.

   (OR)

   b) Classify and explain the allowances used in calculating the standard time.

14. a) It is required to make a lap joint in a 11 mm M.S. plate using flat welding position with 8 mm electrode as shown in figure. Welding speed is 10 meters per hour. When 0.4 kg of metal is deposited per meter length of joint for the current used with 250 amperes and voltage is 30 volts. Labour cost is Rs. 50 per hour, power rate is Rs. 8 per KWhr and cost of electrode is Rs. 60 per kg. Efficiency of the machine is 50% and operating factor is 60%. Calculate the cost of labour, power and electrode per meter of welding.
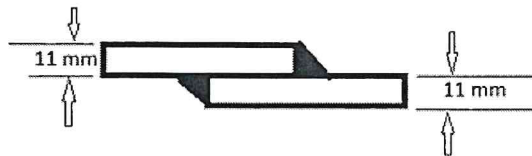

   (OR)

   b) 200 components have to be manufactured as shown in the figure, by upsetting process from a 30 mm diameter bar. Calculate the net weight, gross weight and length of 30 mm bar required. Consider the total losses of the process as 12%. The density of the material is 7.86 gm/cc.
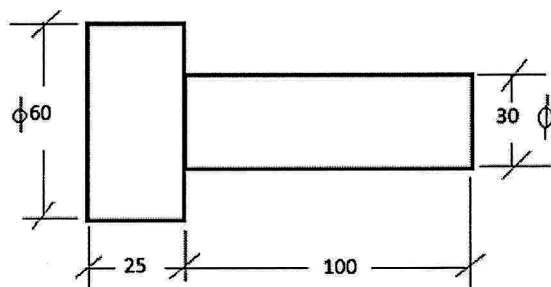
All Dimensions are in mm

15. a) Calculate the total time required to turn one component shown in figure from a 50 mm diameter raw material, using a spindle speed of 800 rpm, feed 0.4 mm/rev. and depth of cut 2.5 mm/pass for the whole operation.

All Dimensions are in mm
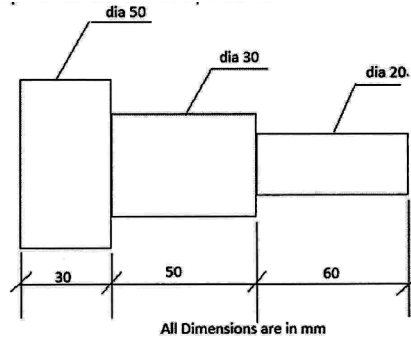
(OR)

b) Calculate the time required for shaping a C.I. block of 500 × 200mm. The cutting speed of shaper is 15 m/min with a feed of 0.9 mm/stroke. The clearance on each side is 20 mm along the length and 15 mm along the width. The ratio of return stroke to cutting stroke is speed is 3:2.

PART – C　　　　　　　　　　　　　　**(1×15=15 Marks)**

16. a) A bolt can be produced either by capstan late or CNC lathe. In capstan lathe, time taken is 1 hour and overhead cost is 50% of labour cost. In CNC lathe time taken is 5 hours for 100 products and overhead cost is 120% of labour cost. The material cost of each product is Rs. 60 and labour cost is Rs. 50/hour in both machines. Which of these two machines is economical for making the bolt ?

(OR)

b) List out the various operations involved in the manufacturing of the part shown in figure from a mild steel raw material of 60 mm diameter and 130 mm length. Make a process planning sheet and indicate the machines and cutting tools required for the same. Tolerance is ± 0.1 mm unless specified.

All dimensions are in mm

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