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BOARD DIPLOMA EXAMINATION, (C-16)

OCTOBER/NOVEMBER—2023

DME - FIFTH SEMESTER EXAMINATION

INDUSTRIAL ENGINEERING - ESTIMATION AND COSTING

Time : 3 Hours]																	[*Total Marks* : 80

PART—A																			3×10=30

Instructions : (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. Define work study. Mention any four objectives of work study.

2. Draw the symbols for the following :

   (a) Inspection

   (b) Delay

   (c) Storage

   (d) Transport

3. State the applications of PMTS.

4. Differentiate between single sampling plan and double sampling plan used in quality control.

5. Write any three differences between inspection and quality control.

6. List out different types of overheads.

7. Write any four objectives of estimation.

8. Write the formulae for finding the volume of

(a) cylinder

(b) frustum of cone

(c) circular ring

9. Find the RPM for turning a steel shaft of 125 mm diameter at a cutting speed of 20 m/min.

**10.** List out any three pattern allowances in foundry.

PART—B

10×5=50

Instructions : (1) Answer *any* **five** questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. What is SIMO chart? Prepare a SIMO chart for the operations of assembling a bolt and nut.

12. *(a)* Briefly explain about two hand chart.

(b) What are the advantages and disadvantages of work sampling?

13. Describe the procedure to be followed for time study by stopwatch method.

14. Draw the neat sketch of an OC curve. Explain different regions and also salient points on the curve.

15. Estimate the volume of material required for producing 1000 parts as shown in the figure. Assume 15% of the finished material is wasted during finishing. All dimensions are in millimeters. Density of material is 7·8 grams/cc.
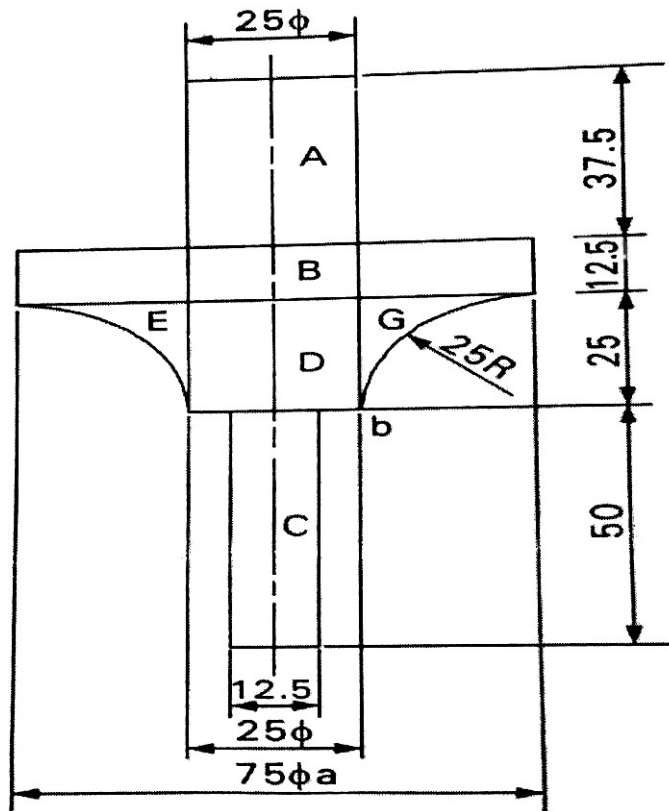
16. Find the time required to turn a 60 mm diameter rod to the dimensions shown in the figure. Take cutting speed as 20 m/min, feed as 1·2 mm/rev. All cuts are 3 mm deep.
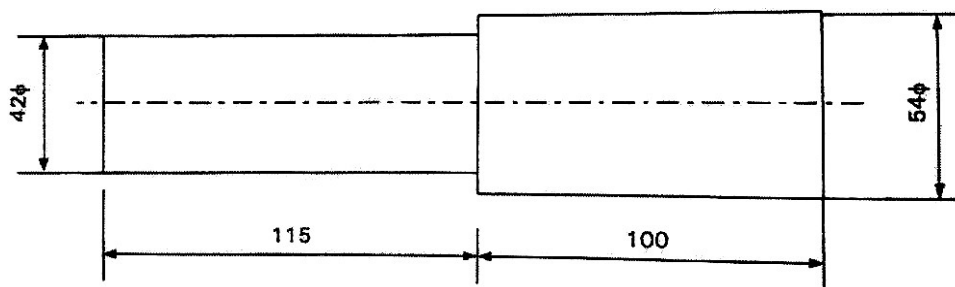
17. Workout the electric welding cost for a cylindrical boiler drum using 2½ m × 1 m diameter which is to be made from 15 mm thick mild steel plates. Both the ends are closed by welding circular plates to the drum. Cylindrical portion is welded along the longitudinal seam and welding is done both on inner and outer sides. Assuming the following data :

(a) Rate of welding = 2 m/hour on inner side and 2·5 m/hour on outerside;

(b) Length of electrode required = 1·5 m/m of welding;

(c) Cost of electrode = ₹5 per metre;

(d) Power consumption = 4 kWh/m of weld;

(e) Power charges = ₹1 per kWh

(f) Labour charges = ₹8 per hour;

(g) Overhead charges = 200% of prime cost

(h) Discorded electrode = 5%;

(i) Fatigue and setting up time = 6% of welding time
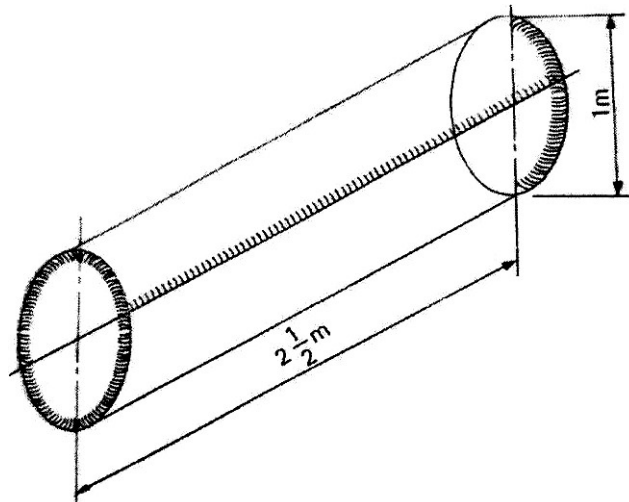
18. *(a)* What are the various forging losses? Explain any two of them.

(b) Write the procedure to estimate the weight of material for a component.

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