C16–M–**502**

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BOARD DIPLOMA EXAMINATION, (C–16)
OCT/NOV—2018
DME—FIFTH SEMESTER EXAMINATION

INDUSTRIAL ENGINEERING ESTIMATING 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. What is the role of work study in raising the productivity?

2. Write any three objectives of method study.

3. What are the allowances to be considered in determining standard time?

4. Write various reasons for a machining process being out of control.

5. List out the types of sampling plan.

6. Write any three objectives of estimation.

7. What are the main elements of cost?

8. Write the procedure to estimate the weight of material for a component.

9. Estimate the machining time to turn a MS rod from 4 cm diameter to 3.5 cm diameter for a length of 15 cm in a single cut. Assume cutting speed 30 m/min and feed 0.4 mm/rev.

10. Write the components for estimating forging cost.

PART—B   10×5=50

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

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

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

11. Describe the procedure for method study.

12. Describe the procedure to be followed for 'time study' by stop watch method.

13. *(a)* Write a short note on string diagram.

(b) What are the advantages of PMTS?

14. In a production process a lot of 250 products have been manufactured in a day. Five samples have been collected arandom in that day as a SQC measure. Each sample size is 5. Five samples *A, B, C, D* and *E* have been collect as shown in the table below for a particular dimension of the product :

Table

Measurements per sample

Sample	1	2	3	4	5
A	43	42	42	44	43
B	45	40	39	39	46
C	40	40	41	42	43
D	43	42	40	40	46
E	40	41	43	46	43

Calculate the control limits and plot $\bar{x}$ and *R* charts.

Assume the following values for the constants:

A_2 0.577; D_3 0.0; D_4 2.11

15. Estimate the volume of material required for manufacturing 100 pieces of shaft as shown in the figure. The shafts are made of M.S. weighing 8 gm/cc and costs Rs. 10 per kg. Calculate also the material cost for such shafts. All dimensions are in mm.
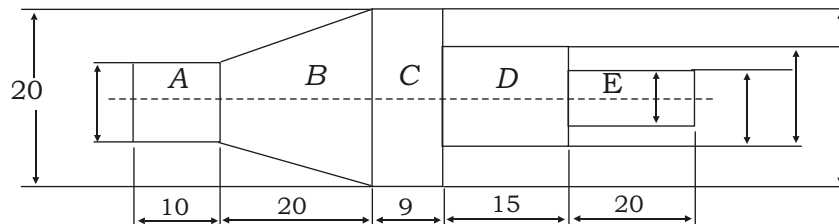
16. Find the time required to turn 3.5 cm dia bar to the dimensions shown in the figure. Cutting speed is 17.6 m/min and feed is 1 mm/rev. All cuts are 3.5 mm deep. All dimensions are in mm.
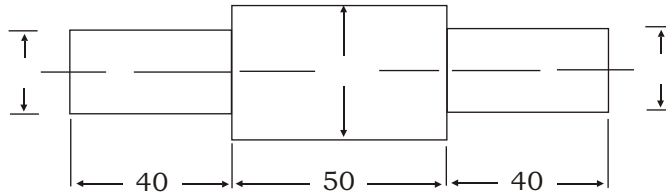
17. *(a)* Write the formula for finding the volume of the following :

  (i) Circular ring

  (ii) Segment of sphere

(b) briefly explain the pattern allowances.

18. Two 1 meter long MS plates of 10 mm thickness are to be welded by a lap joint on both sides with the help of 6 mm electrode. Calculate the cost of welding. Assume the following data :

(i) Current speed = 250 ampere

(ii) Voltage = 30 volt

(iii) Welding speed = 10 m/hr

(iv) Electrodes used = 0·5 kg/m of welding

(v) Labour charges = Rs. 20 per hour

(vi) Power charges = Rs. 2 per kWh

(vii) Cost of electrodes = Rs. 25 per kg

(viii) Efficiency of the machine = 60%

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