



C20-M-502

7656

**BOARD DIPLOMA EXAMINATION, (C-20)
OCTOBER/NOVEMBER—2024
DME – FIFTH SEMESTER EXAMINATION**

INDUSTRIAL ENGINEERING AND 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. What is the role of work study in raising the productivity?
2. What is standard data? State its uses.
3. What are the advantages of statistical quality control?
4. Write any three differences between variable charts and attributes charts.
5. What are the main elements of cost?
6. What do you understand by depreciation?
7. Write the formula for finding the volume of (a) cylinder, (b) sphere and (c) cone.
8. Find the RPM for turning a steel shaft of 40 mm diameter at a cutting speed of 30m/min.
9. Write the causes of forging losses.
10. Sketch any three types of welded joints.

PART—B

8×5=40

- Instructions :** (1) Answer **all** questions.
 (2) Each question carries **eight** marks.
 (3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. (a) Write a short note on string diagram.

(OR)

(b) Define PMTS. Explain the procedure to collect PMTS data and state its advantages, disadvantages, and applications.

12. (a) Find mean and standard deviation from the following data :

X	3	6	9	12	15	18	21
f	4	7	10	15	9	7	7

(OR)

(b) The daily production in machine shop is 1000 components. These components are inspected by GO and NO-GO gauges. A sample of 100 is inspected daily for continuously ten days. The samples are taken at random. Compute the control limits and draw p-chart and np-chart.

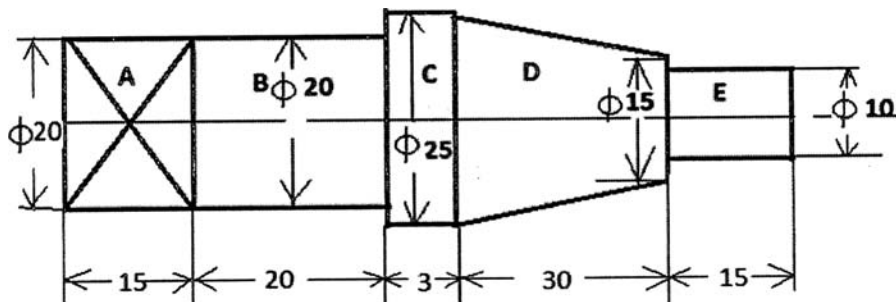
Date	1	2	3	4	5	6	7	8	9	10
Rejections	2	10	6	20	18	14	15	12	8	6

13. (a) Define estimator. List out the qualities of a good estimator.

(OR)

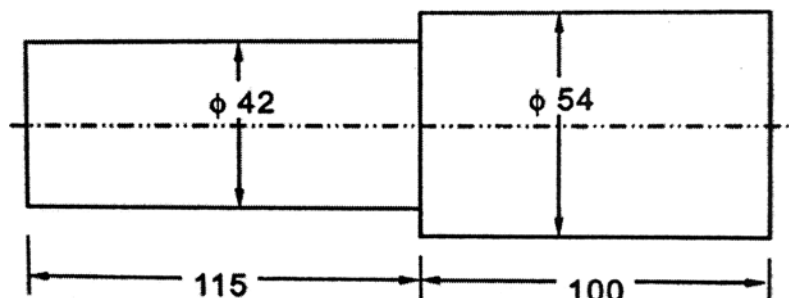
(b) Cost of a machine is ₹ one lakh and its scrap value is ₹ 25,000. The estimated life of machine is 4 years. Determine the depreciation charges for each year using sum of the year digits method.

14. (a) Calculate the cost of brass casting shown in the figure. Density of brass may be taken as 8.6 gm/cc. The cost of brass material is ₹ 60 per kg. All dimensions are in mm.



(OR)

- (b) Find the time required to turn a 60 mm diameter rod to the dimensions shown in figure. Take cutting speed as 20m/min, feed as 1.2 mm/rev. All cuts are 3 mm deep. All dimensions are in mm :



15. (a) A container, open on one side of size $0.5 \times 0.5 \times 1$ m height is to be fabricated from 6 mm thick plates. The plate metal weighs 8 gm/cc. If the joints are to be welded, estimate the cost of container. The relevant data is :

Cost of plate : ₹ 30/kg

Sheet metal scrap : 5% of net volume of material

Cost of labour : 10% of material cost

Cost of welding material : ₹ 40/m of weld

(OR)

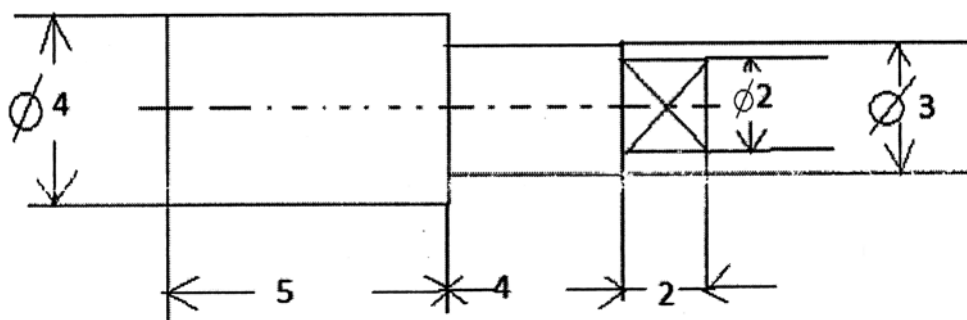
- (b) 100 M.S. pieces of component as shown in figure are to be drop forged from a 4 cm diameter bar stock. Estimate the cost of manufacturing, using given data :

(i) Cost of material = ₹ 100 per meter

(ii) Forging charges = ₹ 0.05 per cm^2 surface area

(iii) On cost = 10% of material cost

Consider all possible losses during operations. All dimensions are in cm.



PART—C

10×1=10

- Instructions :** (1) Answer the following question.
(2) The question carries **ten** marks.
(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

16. Find the welding material cost for making a rectangular frame for a gate of 2 m × 1 m from an angle iron of size 35 mm × 35 mm × 6 mm. Assume the following data.

- (a) Oxygen consumption = 0.4 cubic metre per hour, which is available at ₹ 15 per m³
- (b) Acetylene consumption = 0.4 cubic metre per hour, which is available at ₹ 60 per m³
- (c) Welding speed = 4 m/hr
- (d) Length of filler rod of dia 2.5 mm = 3.4 m/m of welding
- (e) Filler rod material cost = ₹ 20 per kg
- (f) Density of filler rod material = 7 grams per cc
Welding is to be done on both sides

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