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7656

BOARD DIPLOMA EXAMINATION, (C-20)

MAY/JUNE—2023

DME - FIFTH SEMESTER EXAMINATION

INDUSTRIAL ENGINEERING AND 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. Define method study. Write any three objectives of method study.
2. State the applications of PMTS.
3. What is quality control? List any three objectives.
4. Find the mean and standard deviation from the following data :

x	5	7	10	12	15	18	20
f	5	10	15	20	14	11	6

5. List out the qualities of estimator.
6. What are the various causes of depreciation?
7. Write the formulae for finding the volume of following :
 - (a) Frustum of cone
 - (b) Circular ring
 - (c) Sphere
8. Find the time required to face both ends of a 4 cm dia rod of length 8 cm, when it runs at 100 rpm with feed of 0.3 mm per revolution.

9. How do you estimate the cost of arc welding?
10. List out various forging losses.

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) What is an operation process chart? Draw an operation process chart for repairing punctured wheel of a car.

(OR)

- (b) What is work sampling? State its objectives, advantages and disadvantages.

12. (a) The following data was recorded for constructing Mean and Range charts. Sample size is 6. Number of samples are 12. Calculate (i) upper and lower control limits, (ii) draw mean and range charts and (iii) comment on the process. For $n = 6$; $A_2 = 0.48$; $D_3 = 0$ and $D_4 = 2$.

Date	1	2	3	4	5	6	7	8	9	10	11	12
Lot size	325	315	285	510	410	300	430	290	210	250	350	325
No of defectives	42	46	62	43	62	75	51	39	42	58	38	37

(OR)

- (b) The inspection result of a sheet metal part produced is given below :

Date	1	2	3	4	5	6	7	8	9	10	11	12
Lot size	300	300	300	300	300	300	300	300	300	300	300	300
No of defectives	24	15	21	15	42	0	24	30	30	9	9	15

Apply the following charts and discuss results :

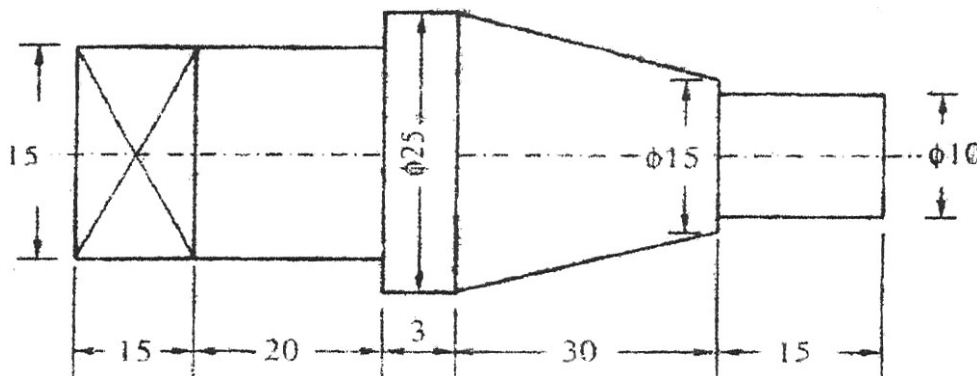
- (i) p-chart
 (ii) np-chart
 (iii) 100 p-chart

13. (a) The market price of a machine is ₹80,000 and distributor is allowed a discount of 25% of the market price. It is found that the selling expenses are 50% of factory cost. The material cost, labour cost and factory overheads are in the ratio of 1 : 3 : 2. If the labour cost is ₹12,000, determine the profit on each machine. Neglect other overheads.

(OR)

- (b) A machine with initial value of ₹2,20,000 and salvage value of ₹40,000 at the end of 20 years, was sold for ₹1,95,000 at the end of 5 years. What is the profit or loss, if sinking fund depreciation method at 8% compounded annually was adopted?

14. (a) Calculate the cost of brass shown in the fig. 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) Determine weight of 150 articles of aluminium shown in figure 2. Take density of mild aluminium as 2.685 gm/cc.

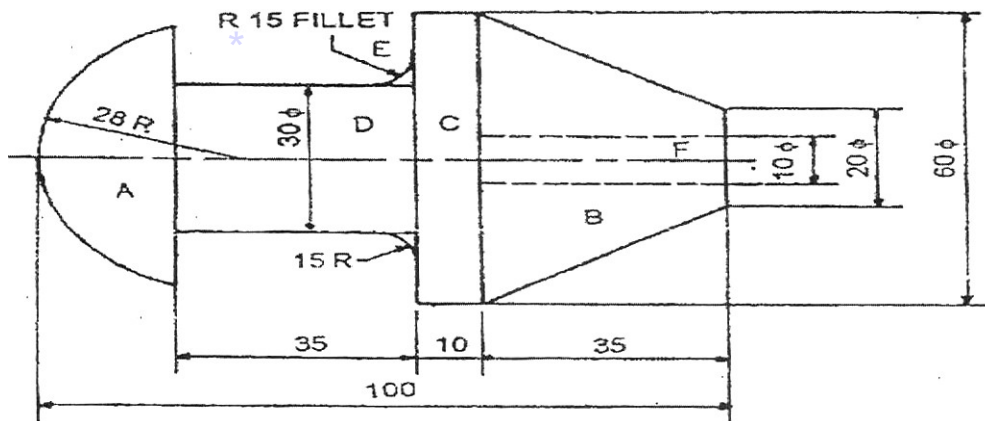
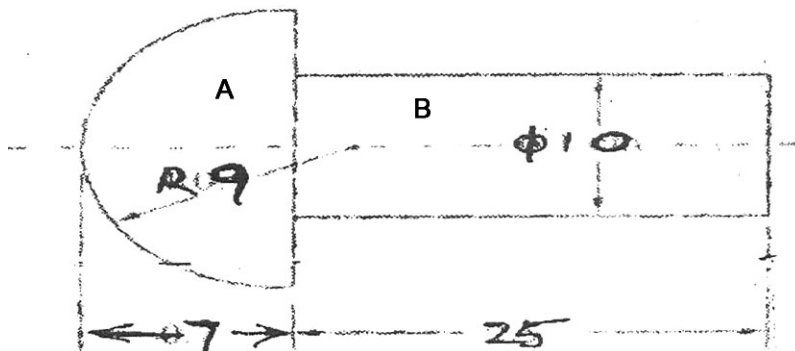


Fig. 2 (All dimensions are in mm)

15. (a) Estimate the length and weight of 1 cm dia stock required to hand forge 300 rivets of dimensions shown in figure below. Assume density of material as 7.5 gm/cc. All dimensions are in mm.



(OR)

- (b) 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 = 0.8 kg/m of welding
 - (v) Labour charges = ₹30 per hour
 - (vi) Power charges = ₹5 per kWh
 - (vii) Cost of electrodes = ₹32 per kg
 - (viii) Efficiency of the machine = 65%

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. A container of size 2 m × 1 m × 0.5 m height is to be fabricated from 6 mm thick plates. The plate metal density is 8 grams/CC. The top of the container is open and the joints are to be welded. Calculate the cost of container. Assume the following data :

- (a) Cost of plate = ₹20/kg.
(b) Metal Scrap = 8% of metal
(c) Cost of labour = 15% material cost
(d) Cost of welding material = ₹15/ meter weld

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