(M-502) INDUSTRIAL ENGINEERING AND QUALITY CONTROL
BLUE PRINT OF MODEL QUESTION PAPER

Sl. No	Chapter Name	Periods Allocated	Weightage Allocated	Question Wise Distribution of Weightage			Marks Wise Distribution of Weightage		
				R	U	Ap	R	U	Ap
1	Work Study	14	26	1	1	2	3	3	20
2	Plant Engineering and Factory Costing.	12	21	1	1	1 ½	3	3	15
3	Quality Control Techniques.	12	21	1	1	1 ½	3	3	15
4	Estimation of Weights and Machining Times	12	21	1	1	1 ½	3	3	15
5	Estimation of Forging and Welding Costs.	10	21	1	1	1 ½	3	3	15
TOTAL		**60**	**110**	**5**	**5**	**08**	**15**	**15**	**80**

Unit Test - 1

Q.No	Question from the Chapter/ Unit	Bloom's category	Marks allocated	CO addressed
Part - A (16 marks)				
1,2	Work Study	R	7	CO1
3	Plant Engineering and Factory Costing.	U	3	CO2
4,5	Quality Control Techniques	U	6	CO3
Part - B (24 marks)				
6	Work Study	U	8	CO1
7	Plant Engineering and Factory Costing.	U	8	CO2
8	Quality Control Techniques	Ap	8	CO3

Unit Test - 2

Q.No	Question from the Chapter/ Unit	Bloom's category	Marks allocated	CO addressed
Part - A (16 marks)				
1,2, 3	Estimation of Weights and Machining Times	U	10	CO4
4, 5	Estimation of Forging & Welding Costs	R,U	6	CO5
Part - B (24 marks)				
6, 7	Estimation of Weights and Machining Times	Ap	8	CO4
8	Estimation of Forging & Welding Costs	Ap	16	CO5

R-Remembering; U-Understanding; Ap-Applying;

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UNIT TEST - I

INDUSTRIAL ENGINEERING AND QUALITY CONTROL (M-502)

Time : 90 Minutes Total Marks: **40**

PART – A

Instructions: *1st Question having 4 one mark questions, and remaining 4 Questions carry 3 marks each*

1. (a) Write the formula for Halsey wage plan.
   (b) Standard of output is the factor to rate the employee (True/False)
   (c) In Emerson's efficiency plan the bonus is calculated on the basis that bonus must be ------ of his daily rages if the efficiency exceeds 100%
   (d) What is the Purpose of Incentive?
2. What are the objectives of method study?
3. What is the Importance of Plant maintenance
4. Differentiate between inspection and quality control.
5. Differentiate discrete data and continuous data?

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PART – B

Instructions: *Part B consists of **3** Units. Answer any one full question from each unit. Each question carries 8 marks and may have sub questions.*

6. Explain the procedure for work measurement by stopwatch method.

(OR)

What are the constituents of standard time? Define each terms involved in computing standard time high lighting the allowances.

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7. Explain different types of Plant layouts.

(OR)

Explain Basic Feature of Emerson's efficiency Plan and discuss the merits and demerits of the plan.

8. 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

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

(OR)

Analyse the differences between variable charts and Attribute charts

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UNIT TEST - II

INDUSTRIAL ENGINEERING AND QUALITY CONTROL (M-502)

Time : 90 Minutes Total Marks: **40**

PART – A

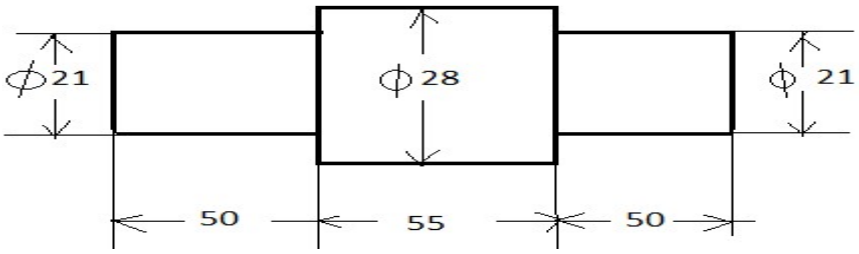
Instructions: *1st Question having 4 one mark questions, and remaining 4 Questions carry 3 marks each*

1. (a) How the weight of the component is calculated.
   (b) Time taken for tapping is more than that of drilling time. (True/False)
   (c) The general formulae for machining time is ----
   (d) State the tool movement in facing operation.
2. Write the formula for finding the volume of (a) Cone (b) Circular ring and (c) Frustum of Pyramid?
3. List different machining processes involved while making the given component.
4. List out various forging losses?
5. What are the costs generally considering while calculating the Gas welding cost?

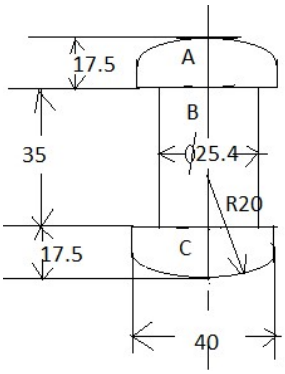
PART – B

Instructions: *Part B consists of **3** Units. Answer any one full question from each unit. Each question carries 8 marks and may have sub questions.*

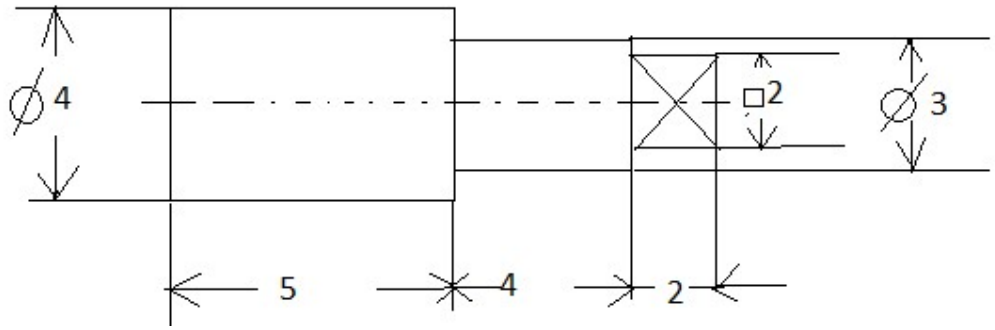
6. Estimate the time required to turn 35mm diameter bar to the dimensions shown in fig. Cutting speed is 15.4m/min and feed is 2mm/rev. All cuts are 3.5mm deep.



(OR)

Estimate the number of rivets made from 4.5kg of mild steel as shown in the  fig. The density of the material is 7.87 grams/cm3. All dimensions are in mm.

7. 200 pieces of a component as shown in the figure. are to drop forged from a 4cm diameter bar stock. Calculate the cost of manufacturing if (a) Material cost is Rs.100 per meter length. (b). Forging charges@ Rs. 010 per cm2 of surface area to be forged. (c) On cost is 10% of material cost. Assume all possible forging losses and all dimensions are centimetre.



(OR)

Two one meter long MS plates10 mm thick are to be welded by a lap joint with 6 mm electrodes. Calculate the cost of welding if: Electrical supply is 250 amps and 30 volts: Welding speed: 10 m/hr; Electrodes used: 0.5kg/m of welding; Labour charges: Rs.15 per hour; Power charges: 1/kWh; Cost of electrode: Rs.15/kg; Efficiency of welding machine: 60%.

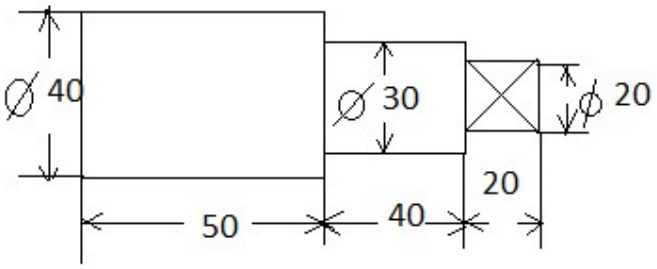
8. 100 M.S. pieces of component as shown in Fig. are to be drop forged from a 4cm dia bar stock. Estimate the cost of manufacturing, using given data .

   a). Cost of material = Rs.100/-meter

b). Forging charges = 0.05Rs./cm2 surface area.

c). on cost = 10% of material cost.

Consider all possible losses during operations.



(OR)

Two one meter long MS plates10 mm thick are to be welded by a lap joint with 6 mm electrodes. Calculate the cost of welding if: Electrical supply is 250 amps and 30 volts: Welding speed: 10 m/hr; Electrodes used: 0.5kg/m of welding; Labour charges: Rs.15 per hour; Power charges: 1/kWh; Cost of electrode: Rs.15/kg; Efficiency of welding machine: 60%.

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D.M.E. – V SEMESTER END EXAMINATION

INDUSTRIAL ENGINEERING AND QUALITY CONTROL (M-502)

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

PART – A

10 x 3 = 30

Instructions: *Part A consists of **10** questions. Answer **all** questions and each question carries **three** marks.*

1. List six advantages of work study?
2. Define Standard time?
3. What is the Importance of Plant maintenance?
4. List any three methods of depreciation.
5. State the causes of variation in a process.
6. Differentiate inspection and quality control.
7. Estimate the machining time to turn a MS Rod from 4 cm to 3.5 cm diameter for a length of 15 cm in a single cut. Assume cutting speed 30m/min and feed 0.4mm/rev.
8. Write the formulae for Volume of (a) Cone (b) Circular ring.
9. List any three types of forging losses.
10. List the costs involved in the estimation of welding cost of a product.

PART – B

5 X 10 = 50

Instructions: Answer any 5 ***Questions***. *Each question carries* ***10*** *marks and may have sub questions.*

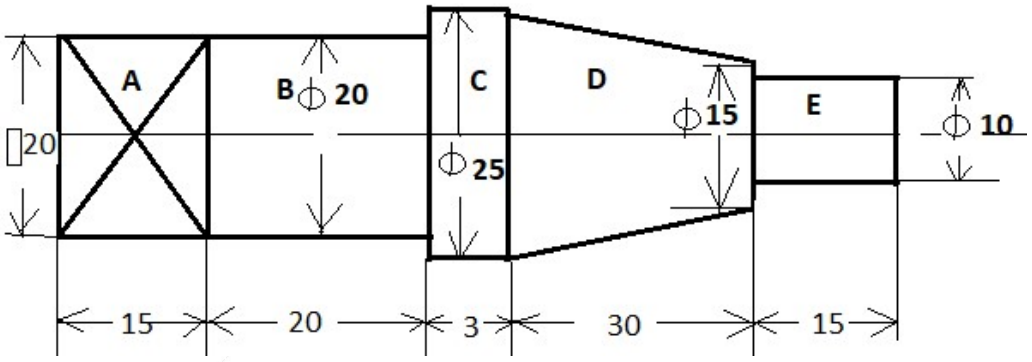
11. Describe the procedure adopted for method study to improve the productivity of the manufacturing Industry.
12. What are the constituents of standard time? Define each terms involved in computing standard time high lighting the allowances.
13. An N.C. machine was purchased for Rs. 15, 00,000 and its life is estimated as 15 years. Its scrap value is Rs. 75,000. Calculate (1) Rate of depreciation (2) Total depreciation fund at the end of four years; (3) Value of the machine at the end of 12 years. Using straight line method of depreciation
14. The following data was recorded for constructing Mean and Range charts. Sample Size is 6. Number of samples are 12. Calculate (a) Upper & Lower control limits (b) Draw Mean and Range charts. (c) Comment on the process.

Sample Number	1	2	3	4	5	6	7	8	9	10	11	12
Mean, $\bar{x}$	325	315	285	510	410	300	430	290	210	250	350	325
Range, R	42	46	62	43	62	75	51	39	42	58	38	37

15. (A) Explain the procedure for estimation of selling price of the given product.

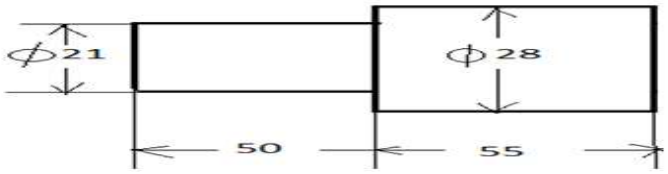
    (B) Explain the 5-S concepts of improving quality in the organisation.

16. Calculate the cost of brass casting shown in the fig. Density of brass may be taken as 8.6 gm/cc. The cost of brass material is Rs.60 per kg. All dimensions are in mm.



17. Two one meter long MS plates 10 mm thick are to be welded by a lap joint with 6 mm electrodes. Calculate the cost of welding if: Electrical supply is 250 amps and 30 volts: Welding speed: 10 m/hr; Electrodes used: 0.5kg/m of welding; Labour charges: Rs.15 per hour; Power charges: 1/kWh; Cost of electrode: Rs.15/kg; Efficiency of welding machine: 60%.

18. (A) Estimate the time required to turn 35mm diameter bar to the dimensions shown in fig. Cutting speed is 15.4m/min and feed is 2mm/rev. All cuts are 3.5mm deep.



(B) 100 M.S. pieces of component as shown in Fig. are to be drop forged from a 4 cm dia bar stock. Estimate the cost of manufacturing, using given data.

a). Cost of material = Rs.100/-meter

Consider all possible losses during operations.