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FIFTH SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/ TECHNOLOGY—MARCH, 2013

INDUSTRIAL ENGINEERING

(Common for ME and TD)

[Time: 3 hours

(Maximum marks: 100)

PART-A

(Maximum marks: 10)

Marks

- I Answer the following questions in one or two sentences. Each question carries 2 marks.
 - 1. State any four applications of value Engineering.
 - Define productivity.
 - Draw the symbols used in process chart for transportion, operation, delay and storage.
 - 4. What do you mean by measure of dispersion?
 - 5. Name the elements of prime cost.

 $(5 \times 2 = 10)$

PART-B

(Maximum marks: 30)

- II Answer any five of the following. Each question carries 6 marks.
 - 1. What are the method of increasing productivity? List any six.
 - 2. Explain process layout with a suitable line diagram.
 - 3. State the basic procedure of method study.
 - 4. Write the differences between variables and attributes with examples.
 - 5. Explain the three measures of central tendency.
 - 6. The cost of a certain scooter is ₹ 50,000 and its scrap value is ₹ 10,000 after a period of 4 years service. Determine the depreciation charges for each year using sum of years digits method.
 - 7. Differentiate estimating and costing.

 $(5 \times 6 = 30)$

PART-C

(Maximum marks: 60)

(Answer one full question from each unit. Each question carries 15 marks.)

UNIT-I

III (a) List the different steps in routing procedure.

(b) What are the factors to be considered while locating industrial plants?

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OR

IV (a) State the principles of material handling.

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(b) Explain preventive maintenance and predictive maintenance.

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UNIT-II

V (a) What is a flow process chart? Briefly explain three types of flow process chart.

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(b) State the applications of work sampling.

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VI (a) Explain SIMO chart with an example.

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(b) The mean observed time and rating factor for the five elements of a job are as follows:

Element	1	2	3	4	5
Mean observed time minute	0.35	0.80	2.8	1.8	1.5
% Rating factor	100	100	80	90	120

Given fatigue and contingency allowances as 5%, 10% and 5% respectively. Compute the allowed time for the job.

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Unit—III

VII (a) Briefly explain floor inspection and centralised inspection.

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(b) The following table shows the number of point defects on the surface of a bus body on a particular day. Construct a C—chart and comment.

Sample Number	1	2	3	4	5	6	7	8	9	10
Number of defects	2	4	7	5	5	6	8	14	2	9

OR

VIII (a) What are the objectives of Quality Control?

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(b) Ten sample of size 5 were subjected to variable inspection. Sample mean and sample range are as given below:

Sample Number	1	2	3	4	5	6	7	8	9	10
Sample range	3	5	2	4	3	3	- 4	5	4	2
Sample mean	11.0	11.3	11.2	11.6	11.8	10.6	10.8	11.4	11.2	11.1

Draw the \overline{X} and R-chart and comment.

For sample size of 5, take $A_2 = 0.58$, $D_3 = 0$, $D_4 = 2.11$.

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Unit-IV

IX (a) What do you mean by overheads? Explain the allocation of overheads on the basis of percentage method and unit rate method.

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(b) The market price of a lathe is ₹2,00,000 and the discount allowed to the distributor is 10% of the market price. It is found that selling expenses are ¼th of the factory cost. If the material cost, labour cost and factory overheads are in the ratio of 1: 4: 2, what profit is made by the factory on each machine, if the material cost is ₹ 16,000.

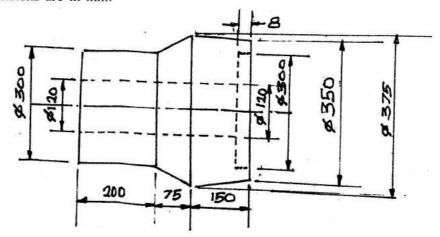
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OR

X (a) Explain straight line and sinking fund methods of calculating depreciation.

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(b) Find the cost of material required to make a bevel gear blank shown in figure. Assume density of material to be 8000 kg/m³ and its cost ₹ 40/kg. All dimensions are in mm.



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