

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.
2. Define productivity.
3. Draw the symbols used in process chart for transportation, operation, delay and storage.
4. What do you mean by measure of dispersion?
5. Name the elements of prime cost. (5×2=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. (5×6=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. 7
 (b) What are the factors to be considered while locating industrial plants? 8

OR

- IV (a) State the principles of material handling. 7
 (b) Explain preventive maintenance and predictive maintenance. 8

UNIT—II

- V (a) What is a flow process chart? Briefly explain three types of flow process chart. 8
 (b) State the applications of work sampling. 7

OR

- VI (a) Explain SIMO chart with an example. 8
 (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. 7

UNIT—III

- VII (a) Briefly explain floor inspection and centralised inspection. 8
 (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? 7
 (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 \bar{X} and R-chart and comment.

For sample size of 5, take $A_2 = 0.58$, $D_3 = 0$, $D_4 = 2.11$. 8

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. 7
- (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 $\frac{1}{4}$ th 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. 8

OR

- X (a) Explain straight line and sinking fund methods of calculating depreciation. 7
- (b) Find the cost of material required to make a bevel gear blank shown in figure. Assume density of material to be 8000 kg/m^3 and its cost ₹ 40/kg. All dimensions are in mm. 8

