



C14-M-403

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BOARD DIPLOMA EXAMINATION, (C-14)
MARCH/APRIL—2016
DME—FOURTH SEMESTER EXAMINATION
INDUSTRIAL ENGINEERING

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.
(4) SQC tables are permitted.

1. What is an operational process chart? List four process chart symbols. 2+1
2. Define micro motion study. List two applications. 2+1
3. Define work measurement. List two important objectives of work measurement. 2+1
4. Define an allowance. List four allowances of estimating the standard time. 1+2
5. What is meant by job specification? 3
6. List advantages of merit rating. 3

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7. List six important methods of wage payments. 3
8. Classify various types of incentive plans with one example each. 3
9. Define the term quality. List four quality characteristics. 1+2
10. Define sampling inspection. List two advantages of sampling inspection over 100% inspections. 2+1

PART—B

10×5=50

Instructions : (1) Answer *any five* questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. Define method study. Explain the step-by-step procedure of conducting method study for improving productivity in an industry. 2+8
12. Explain the following with examples : 5+5
- (a) Flow diagram
- (b) String diagram
13. (a) In a work sampling, conducted on a welder shows that he was idle for 20% of the total working time of 8 hours. The performance rating of the worker in the duty time is 125%. Assume that 10% of normal time is taken as allowances. Calculate the standard time to complete the operation. 4
- (b) Explain the procedure for calculating sample size by work sampling method. 6
14. (a) Explain clearly the procedure of job evaluation. 4
- (b) Explain (i) classification method and (ii) checklist methods of job evaluation and merit rating. 6

15. (a) Explain Rowan incentive plan. List two advantages of the plan. 4

(b) In an industry, there are six workers manufacturing electrical switches. The standard day rate is ₹ 60 per worker and the standard output is 50 switches. Calculate their daily earnings by Emerson's Efficiency Plan if they are manufacturing 15, 25, 35, 45, 50 and 60 switches respectively. 6

16. (a) State advantages and disadvantages of PMTS. 5

(b) Explain five types of wages applicable to the workers in an industry. 5

17. The following data was recorded for variable control charts :

<i>Sample Number</i>	1	2	3	4	5	6	7	8	9	10
<i>Mean \bar{X}</i>	7	7.5	8	10	9.5	11	11.5	4	3.5	4
<i>Range R</i>	2	3	2	2	3	4	3	2	3	2

(a) Calculate upper and lower control limits.

(b) Calculate construct mean and range charts.

(c) Comment on the process. 4+4+2=10

18. (a) Draw and explain the main characteristics of an OC curve. 4

(b) In an acceptance sampling plan under ABC-STD-105, a single sampling plan is to be used under inspection level III with lot size 2000 and AQL of 2.5%. What is an acceptance criterion under (i) normal inspection and (ii) tightened inspection? 6
