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**END SEMESTER EXAMINATION – 2022**

Semester : 5th (New)

Subject Code : Me-502

**INDUSTRIAL ENGINEERING**

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks for the questions.

**Instructions :**

1. *All* questions of PART – A are compulsory.
2. Answer any *three* questions from PART – B.

**PART – A**

Marks – 25

1. Fill in the blanks : 1×10=10

- (a) In Work study, the symbol O implies \_\_\_\_\_.
- (b) If a worker gets daily wage of Rs. H, then according to Rowan plan, his maximum daily earnings can be \_\_\_\_\_.

[Turn over

- (c) The start or completion of task is called \_\_\_\_\_.
- (d) SQC techniques are based on the theory of \_\_\_\_\_.
- (e) \_\_\_\_\_ assess the worth of a person performing the job.
- (f) Standard time is the sum of \_\_\_\_\_ and \_\_\_\_\_.
- (g) Time study is carried out to determine the time required to complete the job by \_\_\_\_\_.
- (h) The graphical representation of collected information is known as \_\_\_\_\_.
- (i) The study of work measurement leads to \_\_\_\_\_.
- (j) In ranking system, jobs are ranked in terms of their importance with respect to level of duties and responsibilities from \_\_\_\_\_ to \_\_\_\_\_.

2. Write true or false :

1×5=5

- (a) Dummy activity does not consume time and resources.
- (b) In micro-motion study, Therbligs is represented by standard symbol and colour.

- (c) The critical activity has zero float.
- (d) Job evaluation determines the worth of a person performing the job.
- (e) Halsey Premium Plan gives bonus only on the percentage of time saved.

3. Choose the correct answers : 1×10=10

- (a) Work study is concerned with
  - (i) improving present method and finding standard time
  - (ii) improving production capacity
  - (iii) improving production and control
  - (iv) All of the above
- (b) Which one is a method of merit rating ?
  - (i) Factor comparison method
  - (ii) Point rating method
  - (iii) Check list method
  - (iv) All of the above
- (c) PERT has the following time estimate
  - (i) One time estimate
  - (ii) Two times estimate
  - (iii) Three times estimate
  - (iv) Four times estimate

- (d) What type of chart will be used to plot the number of defectives in the output of any process ?
- (i) X bar chart                      (ii) R chart
  - (iii) C chart                          (iv) P chart
- (e) What does CPM stand for ?
- (i) Control Path Method
  - (ii) Critical Path Method
  - (iii) Critical Plan Management
  - (iv) Control Path Management
- (f) Slack time in PERT analysis
- (i) can never be less than zero
  - (ii) is minimum for critical events
  - (iii) can never be greater than zero
  - (iv) is maximum for critical events
- (g) Quantities that can be numerically measured, can be plotted on a
- (i) X bar chart                      (ii) P chart
  - (iii) C chart                          (iv) NP chart



- (h) Objective of job evaluation is
- (i) to ensure correct wages
  - (ii) to reduce work imbalance
  - (iii) to resolve wage disputes
  - (iv) All of the above
- (i) Motion study involves analysis of
- (i) actions of operator
  - (ii) layout of work place
  - (iii) tooling and equipment
  - (iv) All of the above
- (j) Which is not a job evaluation system ?
- (i) Ranking method
  - (ii) Point rating method
  - (iii) Factor comparison method
  - (iv) Forced choice method.

## **PART – B**

**Marks – 45**

4. (a) Explain the symbols used in Method Study.
- 6
- (b) What is a Process Flow Chart in production ?  
What are its uses and advantages ?

3+3+3=9

5. (a) What are the objectives of Method Study ?  
Explain the procedure for Method Study.  $4+4=8$
- (b) What is Time Study ? Explain the equipments  
required for Time Study.  $3+4=7$
6. (a) Define Job Evaluation. What are the objectives of Job Evaluation ?  $1+4=5$
- (b) What are the differences between Job  
Evaluation and Merit Rating ? 4
- (c) Define Wages. Name the different types of  
Wage Incentive Plans.  $1+5=6$
7. Write short notes on any *three* :  $5 \times 3 = 15$
- (a) Predetermined Motion Time Study (PMTS)
- (b) PERT
- (c) R-chart
- (d) Statistical Quality Control
- (e) Bonus and Incentives.