

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2178

Roll No.

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B.Tech.

(SEM. V) ODD SEMESTER THEORY EXAMINATION 2012-13

WORK STUDY AND ERGONOMICS

Time : 3 Hours

Total Marks : 100

Note : (1) Attempt all questions.

(2) Marks are mentioned against each one.

1. Attempt any **FOUR** of the following : **(4×5=20)**
 - (A) Define productivity and different measure used to describe it. What is its role in controlling ?
 - (B) What do you mean by standard of living ? Mention and explain its determinants.
 - (C) How might an increase in productivity of a business affect (i) employees, (ii) stockholders, and (iii) consumers ?
 - (D) What do you mean by Labour and Land productivity ?
 - (E) What is Industrial Engineering ? What are the fields that come in its scope ? How is it different from Industrial Management ?
 - (F) What do you mean by Job Evaluation ? How it is done ? Explain.
2. Attempt any **TWO** of the following : **(2×10=20)**
 - (A) (i) Define the motion and time study according to (a) Taylor and (b) Gilbreth. 4

- (ii) Summarize the work of H L Gantt. 2
- (iii) What do you mean by primary, secondary and tertiary analysis of facts and present method ? 4
- (B) (i) Construct a process chart and flow diagram for making coffee in an electric coffee maker. 5
- (ii) Explain the advantages of multiactivity chart. Explain it with the help of an example. 5
- (C) (i) Prepare two handed operation chart for opening several different designs of soft-drink cans and bottle. 3
- (ii) Explain a Wink. 1
- (iii) Mention different Therbligs. 6
3. Attempt any **TWO** of the followings : (2×10=20)
- (A) (i) What are the steps in performing a stop watch time study ? 5
- (ii) What are predetermined motion times ? 3
- (iii) Describe job that contains productive as well as non productive time. 2
- (B) (i) Distinguish between actual time, normal time and standard time. 4
- (ii) What are the limitations of time study ? 3
- (iii) What is synthetic rating system ? 3
- (C) An analyst has become familiar with a job and has divided it into four elements. The element times for the first four cycles are given below with a performance

rating of each element. Determine the normal time for the job. 10

Element	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Performance Rating (%)
1	1.38	1.58	1.71	1.49	100
2	0.29	0.35	0.30	0.38	120
3	0.61	0.58	0.53	0.57	105
4	0.77	0.82	0.74	0.88	90

4. Attempt any **TWO** of the followings : $(2 \times 10 = 20)$
- (A) (i) Distinguish between work sampling and time study. 2
- (ii) Define a wage incentive plan. For what reasons might a company elect to use a wage incentive plan ? 2+3
- (iii) Explain how wage and incentive systems are related to cost and productivity. 3
- (B) (i) Explain different methods of job evaluation on the basis of their merits and demerits. 5
- (ii) Distinguish between conventional wage-incentive system. 5
- (C) Employees in the assembly deptt. of Mc Daniel Microwave Corporation are paid on a one-for-one incentive plan beginning at 90% of standard. Tom Minor works in this deptt. and earns base wage of \$ 9.20/hour for a 40 hour-week. The standard for Tom's job is 7 units/hour. Last week, Tom produced 310 units.
- (i) How many standard hour did Tom produce last week ? 5
- (ii) How much gross pay did he earn for this week ? 5

5. Attempt/Answer any **FOUR** of the following : (4×5=20)

- (i) Explain the process of rating the work of an operative.
- (ii) Mention different types of recording technique of different processes.
- (iii) Explain the important anthropometric factors in design.
- (iv) How the human capabilities can be assessed ? Explain.
- (v) Define element, task, job, operation and process.
- (vi) Explain synthetic rating method.