Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/M. Tech (ME)/SEM-1/MMT-104B/2011-12

2011
ERGONOMICS & WORK SYSTEM DESIGN

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

Answer any *five* questions out of the following.

5 × 4 = 20

1. Define Ergonomics. How is it related with work study ? 2 + 2
2. What are the factors affecting productivity ? What is productivity index ? 3 + 1
3. Define method study. What are its scope and objectives ? 2 + 2
4. What is meant by "Normal time" of an operation ? How is it different from "Standard Time" ? 2 + 2
5. What are the different types of coding of controls ? Give examples. 4
6. What is HAVS ? How can it be eliminated ? 1 + 3

GROUP – B

Answer any *five* questions out of the following. $5 \times 10 = 50$

7. What are the causes of low productivity ? What are the various techniques of their elimination ? What are the various methods of improving productivity in a manufacturing plant ? 3 + 3 + 4
8. What is meant by work measurement ? What are the different techniques of work measurement ? How is it related to method study and time study ? 2 + 5 + 3
9. What is meant by "Rating" in time study ? How is performance Rating related with Standard Time and Standard Performance ? Why are relaxation and fatigue allowances considered in building up the standard time of a job ? 2 + 4 + 4
10. What are the different occupational loads on human body ? What is metabolism ? How does muscle metabolism take place ? How does muscle fatigue occur ? 2 + 2 + 3 + 3
11. What are the different types of biomechanical movements ? Explain :
    a) Abduction and adduction
    b) Flexion and extension
    c) Supination and pronation 4 + 6
12. What is heat stress ? How is it related with thermoregulation ? What are the different methods of reducing heat stress ? What are the adverse effects of environmental heat, cold and humidity on human health and performance ? 2 + 2 + 2 + 4