Register Number: …….

M.E. DEGREE EXAMINATIONS: JANUARY 2011

First Semester

INDUSTRIAL ENGINEERING

IEE501: Work System Design

Time: Three Hours **Maximum Marks: 100**

Answer ALL Questions:-

PART A (10 x 2 = 20 Marks)

1. What is total factor productivity?
2. What is the relation between production and productivity?
3. Draw the process chart symbols for “operation cum transport”.
4. Define the term “work measurement”.
5. What is rating factor in the calculation of standard time?
6. What is standard data?
7. Define work sampling and state the main applications of work sampling?
8. Why is measurement of indirect labour difficult?
9. What is ergonomics? Briefly explain its usefulness to work-study.
10. What is anthropometry?

PART B (5 x 16 = 80 Marks)

11. (a) What are the ways in which Management and Workers can contribute for productivity improvement?

(OR)

(b) In detail discuss on job design and productivity.

12. (a) “The activities in method study are recorded with the help of certain symbols and charting conventions”. Write these symbols and conventions and explain with examples what each symbol and convention stands for?

(OR)

(b) State the 26 basic principles of motion economy.

13. (a) The elemental times (in minutes) for 4 cycles of an operation using a stop watch are presented below.

Elements	Cycle time in minutes			
	1	2	3	4
1	1.5	1.5	1.3	1.4
2	2.6	2.7	2.4	2.6
3	3.3	3.2	3.4	3.4
4	1.2	1.2	1.1	1.2
5	0.51	0.51	0.52	0.49

Calculate standard time for the operation if,

(i) Elements 2 and 4 are machine elements

(ii) For other elements, the operator is rated at 110%

(iii) Total allowances are 15% of the normal time.

(OR)

(b) State how a job is selected for the purpose of time study? Also state the procedure for conducting time study.

14. (a) Describe the procedure for planning and organizing a work sampling study.

(OR)

(b) Elaborate on “design of forms” and the common faults in form design.

15. (a) Elaborate on the factors affecting human performance at work.

(OR)

(b) With reference to the concepts of ergonomics, discuss on the design of displays and controls.

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