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**BE/B.Tech (Full Time) DEGREE END SEMESTER EXAMINATION April / May 2012**  
**Industrial Engineering Branch**

**Third Semester**

**IE 9201 Work System Design**

**(Regulations 2008)**

(4)

**Time : 3 hrs**

**MaxMarks :100**

**Answer All Questions**  
**PART – A(10 x 2 = 20 marks)**

1. Define Ineffective time.
2. What are the factors of production?
3. Define Method study.
4. What do you mean by critical examination?
5. What are Allowances? Give examples.
6. What do you mean by performance rating?
7. What is Group Timing Technique?
8. Briefly explain the Halsey Plan.
9. Define O&M.
10. What do you mean by Form design?

**PART – B (5 x 16 = 80 Marks)**

- 11 (i) Discuss the History and development of work study. (8 Marks)
- (ii) Explain the productivity and standard of living (8 Marks)
- 12 (a). Explain various flow process charts with suitable examples.

(or)

- (b). Discuss the principles of motion economy.

13 (a). Discuss how will you conduct stop watch time study to fix standard time for an operation.

(or)

(b). Determine the standard time for the following job. Add 20% for allowances. The times shown are continuous stop-watch reading in hundredths of a minute.

ELEMENTS	Cycles							Rating
	1	2	3	4	5	6	7	
a) Get two cases	10		54		04		52	100%
b) Put part into case	21	40	64	82	15	33	59	90%
c) Fasten parts into position	28	47	72	96	22	40	81	110%

14 (a). Discuss with an example how you will conduct work sampling study to fix the allowed time for a job.

(or)

(b) (i). On the basis of the following information, calculate the earnings of Ram and Shyam under Straight Piece-Rate system and Taylor's Differential Piece-Rate System: (8 marks)

Standard production 8 units per hour

Normal time rate Rs.40 per hour

Differential to be applied:

80% of the piece rate below standard

120% of the piece rate at or above standard

In a 9 hour day Ram produces 54 units and Shyam produces 75 units.

(ii). A workman whose basic rate of pay is Rs.30 per hour is working under the "Rowan plan" of premium bonus. In addition, he receives a 'Cost of living' bonus of Rs.300 per week of 44 hours. During a week he does the following job: (i) Job "A" for which 30 hours are allowed, in 20 hours; (ii) Job "B" for which 36 hours are allowed in 20 hours. During the week his waiting time amounts to 4 hours (to be treated as overhead). Calculate the workman's earnings and the amounts to be charged to each job and to overhead (8 Marks)

15 (a). Discuss how you will conduct method study in office.

(or)

(b). "Measurement of indirect labour is a tedious job and it involves several factors". Do you agree with the statement? Justify your answer with examples from Indian Industry.