

INDUSTRIAL ENGINEERING

THIRD SEMESTER- (REGULATION-2008)

IE9201 WORK SYSTEM DESIGN

(Use of Statistical/Industrial Engineering Tables are permitted)

Time: 3 hr

Max. Mark: 100

Answer ALL Questions

Part-A (10 X 2 = 20 Mark)

1. What are the factors will be helpful for overcoming the ineffective time?
2. List out any four techniques for the elimination of Ineffective time?
3. What is the purpose of secondary questions in the critical examination?
4. What are the advantages of films over visual methods in micro motion studies?
5. What are the errors in work sampling?
6. What is the significance of split hand stop-watches?
7. What is the purpose of Group Timing Technique?
8. What are the elements of incentive plans?
9. What are the advantages of computer aided time-study?
10. Mention any four check lists for procedural analysis in the office method study?

Part-B (5 X 16 = 80 Marks)

11. A leading hospital in Chennai follows certain systematic way of serving dinners in a hospital ward. The hospitals ward containing 17 beds. When dinners were served by the nurse in charge of the ward fetched a large tray bearing the first course, together with the plates for the patients, from the kitchen. The food was usually contained in three dishes two of which held vegetables and the third the main dish. The nurse placed the tray on the table marked serving table. She set the large dishes out on the table, served one plate with meat and vegetables and carried it to bed1. She returned to the serving table and repeated the operation for the remaining 16 beds. When she served all the patients with the first course, she returned to the kitchen with the tray and the empty dishes, collected the dishes and plates for the second course and returned to the ward. She then repeated the complete operation, replacing the plates emptied by the patients with plates containing their second course and returning the used plates to the serving table, where she stacked them. Finally she made a tour of the ward, collecting up the empty plates from the second course, and carried everything on the tray back to the kitchen. First identify which type of chart can be used for the current method and propose the new method for the identified chart? (16)

12 (a) Elaborate the various steps taken to calculate the total productivity, total factor productivity, return-on-investment, labor & capital productivity? (16)

OR

12 (b) With the help of a neat flow-chart explain the steps involved in the method study? (16)

13 (a) Calculate the following from table 1.1

- (i) Standard time for each element and then for the complete work cycle
- (ii) Check whether the observations are sufficient for 95% confidence level and within accuracy of +5% for each element.
- (iii) Operative requirement- if 10,000 pieces are to be produced per shift. (16)

Table 1.1 Data recording for all the four manual-elements

Element No	Time-Recording (Observations)										Average Rating	Allowances Permitted
	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10		
1	09	41	71	107	38	67	98	28	57	87	115%	15%
2	15	46	79	13	43	72	204	33	62	93	105%	15%
3	28	59	94	27	56	85	18	46	76	306	97%	15%
4	32	62	98	30	59	88	21	49	79	09	120%	15%

OR

13 (b) Explain the determination of sample size and the procedure for selecting random observations in work sampling? How will you conduct the work sampling study? (16)

14 (a) Enumerate the various wage incentive schemes with suitable examples? (16)

OR

14 (b) Explain the following terms and find out time in TMU/minute? (16)

- (a) P1NSD (b) R12Am (c) G1A (d) T90L (e) mM10C (f) M16B15

15 (a) Describe the procedure followed in forms design and control in detail? (16)

OR

15 (b) Write short notes for the following:

- (i) Work measurement of office work (6)
- (ii) Development of Standard Data (6)
- (iii) MTM Classification (4)