

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII • EXAMINATION – SUMMER • 2014****Subject Code: 172502****Date: 03-06-2014****Subject Name: Productivity Improvement Methods****Time: 02:30 pm - 05:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Explain the term Productivity. How does it differ from Production? Give examples to justify your answer. **07**
- (b) What is meant by standard of living of the people? What is the relationship between Productivity and Standard of living? **07**
- Q.2** (a) What do you understand by ineffective time added which is within the control of workers? How does the management reduces this ineffective time? **07**
- (b) There are two industries manufacturing two types of plugs. The standard time per piece is 1.5 minutes. The output of the two industries is 300 and 200 respectively per shift of 8 hours. **07**
- (i) What is the Productivity of each per shift of 8 hours.
- (ii) What is the Production of each per week (6days) on the basis of double shift?

OR

- (b) A factory can manufacture two products A & B by using either of two materials P or Q. Product A is expected to sell at Rs 70 per unit and product B at Rs 30 per unit. The operating data are as follows: **07**

	Material P	Material Q
* Output A	200 units	200 units
Output B	300 units	200 units
* Quantity of raw material usage	1000 Kg	1000 Kg
* Labour usage	300 man-hrs	250 man-hrs
* Elect.energy consumption	1000 kwhr	1500 kwhr
* Cost of raw materials/kg	Rs 20	Rs 30
* Labour per man-hr	Rs 5	Rs 5
* Elect.energy / kwhr	Rs 1.5	Ra 1.5

Compare the productivity of materials, labour and electrical energy in using material P and Q. Comment on the relative advantage of using either of the materials.

- Q.3** (a) What are the general characteristics of conveyors? Trucks? Cranes? And Hoist? **07**
- (b) Explain in brief the following factors to be considered in selection of job for work simplification. **07**
1. Economic or Cost effective consideration
 2. Human consideration

OR

- Q.3** (a) Compare and contrast Flow process chart and Two handed process chart in context of construction, usage and symbols used. **07**
- (b) Make a Two handed process chart, yielding maximum efficiency, for the assembly of a Electrical Tester consisting of five components. **07**
- (1) Barrel (2) Filament bulb (3) Resister (4) Clip (5) Cap

- Q.4 (a)** What are 'therbligs'? Give the symbols, abbreviations and meaning of the following therbligs. **07**
 (1) Find (2) Grasp (3) Unavoidable delay (4) Position (5) Avoidable delay
- (b)** Make a Two handed process chart, yielding maximum efficiency, for the assembly of a bolt, two washers, square wooden block with center hole and nut. **07**

OR

- Q.4 (a)** Describe the various stop watches used in time study. State the uses and limitations of each of them. **07**
- (b)** Explain why is it necessary to break an operation in to elements. **07**
- Q.5 (a)** Define various types of elements and give one example of each type. **07**
- (b)** The continuous time reading in centiminutes, rating and allowances for four elements for an operation are as follows: **07**

Element Observations →	1	2	3	4
1 ↓	8	13	26	29
2	37	42	55	58
3	68	74	88	91
4	98	103	16	19
5	24	29	43	46
6	54	60	73	76
Average rating	110 %	120 %	105 %	120 %
Allowances	15 %	20 %	15 %	20 %

Calculate:

- (i) Standard time for each element and for the work cycle.
- (ii) Determine the number of workers required if 10000 pieces of the above job are required per shift of 8 hours.

OR

- Q.5 (a)** Explain in brief the following allowances . **07**
 (1) Contingency allowance
 (2) Special allowance
- (b)** Explain in brief synthesis technique of work measurement. **07**
