

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE - SEMESTER-VII • EXAMINATION – WINTER 2013**

**Subject Code: 172502****Date: 05-12-2013****Subject Name: Productivity Improvement Methods****Time: 10:30 TO 01:00****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)** Enlist the factors influencing productivity. Explain how each factor will affect productivity. **07**

**(b)** Mention the tools to reduce the excess work content. Explain any two tools in brief. **07**

**Q.2 (a)** Explain the need of incentive schemes for proper implementation of productivity changes. **07**

**(b)** Why must the following be carried out concurrently ? **07**

- (i) Selection of handling equipment
- (ii) Location of work station, and
- (iii) Arrangement of facilities within work station.

**OR**

**(b)** The following data is available for a machine in a manufacturing unit. **07**

- # No. of hours worked per day..... 8  
 # Working days per month ..... 25  
 # Number of operators ..... 1  
 Standard time per unit of production:  
 # Machine time ..... 22 min.  
 # Operator time ..... 08 min.  
 # Total time per unit ..... 30 min.

If plant is operated at 75% efficiency, and the operator is working at 100% efficiency, what is the output per month?

**Q.3 (a)** What is the difference between product layout and a process layout? Under what conditions would each be adopted? **07**

**(b)** Explain in brief, 'Critical Examination' as applied to work study. **07**

**OR**

**Q.3 (a)** Describe an operation process chart in terms of the information it contains. What is the function of the chart in the development of departmental arrangement? **07**

**(b)** Explain the significance of principles of motion economy and state the principles of motion economy related to use of human body. **07**

**Q.4 (a)** A machinist has to attend two machines. The actual time taken by both machines are as follows: **07**

- \* Loading the job ..... 2 min  
 \* Unloading the job ..... 1 min  
 \* Machining time (Auto feed) ..... 5 min  
 \* Inspection of finished job ..... 3 min

Prepare a man-machine chart yielding the highest efficiency.

**(b)** Explain why it is required to break an operation into elements for time study. **07**

**OR**

- Q.4** (a) What guides will a time study analyst adhere to when breaking an operation down into its elements? What rational underlies each of these guides? **07**
- (b) What are relaxation allowances? Why is it given? How is it measured? **07**
- Q.5** (a) What is rating? Why is it used in time study? **07**
- (b) Time study has been carried out for a job having seven elements through cumulative timing method. From the study, following observations have been made. **07**

| Element Number           | 1   | 2   | 3   | 4   | 5   | 6   | 7   |
|--------------------------|-----|-----|-----|-----|-----|-----|-----|
| Observed time in seconds | 17  | 52  | 235 | 291 | 357 | 397 | 420 |
| Rating, %                | 105 | 115 | 90  | 100 | 85  | 120 | 80  |

Determine the standard time of a job considering relaxation and contingency allowances as 12% and 8% respectively of the basic time.

**OR**

- Q.5** (a) Explain briefly the concept of work sampling with suitable example. **07**
- (b) Explain in brief: **07**
- (i) Financial incentives
  - (ii) Non financial incentives
  - (iii) Individual incentive scheme
  - (iv) Group incentive scheme

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