# GUJARAT TECHNOLOGICAL UNIVERSITY
## BE - SEMESTER–V (NEW) EXAMINATION – SUMMER 2021

**Subject Code:3151509** **Date:13/09/2021**
**Subject Name:Work System design and Ergonomics**
**Time:10:30 AM TO 01:00 PM** **Total Marks: 70**

**Instructions:**
1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

|     |     |     | MARKS |
|-----|-----|-----|-------|
| **Q.1** | **(a)** | What is ergonomics? | 03 |
|     | **(b)** | State the application of work system design. | 04 |
|     | **(c)** | What do you understand by the term 'work measurement'? What is its relationship with method study? What are the objectives of work measurement in an industry? | 07 |
| **Q.2** | **(a)** | Define 'Work Study'. | 03 |
|     | **(b)** | Discuss why work study is a direct means of raising productivity. | 04 |
|     | **(c)** | Discuss the principles of motion economy. | 07 |
|     |     | **OR** |     |
|     | **(c)** | How would ergonomics help to analyze man – machine system ? Can this study improve the work – station layout ? How ? Discuss. | 07 |
| **Q.3** | **(a)** | What is method study? | 03 |
|     | **(b)** | Discuss the effects of working condition on productivity. | 04 |
|     | **(c)** | Explain features of human body & explain measures of physiological functions. | 07 |
|     |     | **OR** |     |
| **Q.3** | **(a)** | Distinguish between a flow diagram and a string diagram. | 03 |
|     | **(b)** | Give the procedure for constructing a string diagram. | 04 |
|     | **(c)** | Memo motion study is gaining more popularity, why ? Discuss some of its applications in industries. | 07 |
| **Q.4** | **(a)** | What is an element in time study? | 03 |
|     | **(b)** | State the reasons for breaking down the job in to elements? | 04 |
|     | **(c)** | What is rating? Discuss various methods of rating. | 07 |
|     |     | **OR** |     |
| **Q.4** | **(a)** | State the application of work measurement. | 03 |
|     | **(b)** | Explain various types of allowances. | 04 |
|     | **(c)** | Write note on 'Therblig' : Types, symbols and applications | 07 |
| **Q.5** | **(a)** | What is Anthropometry? | 03 |
|     | **(b)** | Explain clearly the steps involved in arriving at standard time. | 04 |
|     | **(c)** | How can work sampling be used to study production in machine shop? Explain with the help of suitable example. | 07 |
|     |     | **OR** |     |
| **Q.5** | **(a)** | Explain the use of human anthropometry in workplace layout. | 03 |
|     | **(b)** | Discuss about Predetermined Motion Time Systems. | 04 |
|     | **(c)** | Explain MOST and its types in brief. | 07 |

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