Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–III(New) • EXAMINATION – WINTER 2016**

**Subject Code:2132104** **Date:06/01/2017**

**Subject Name:Testing of Metals and Alloys**

**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.**

| | | | MARKS |
|---|---|---|---|
| **Q.1** | | **Short Questions** | **14** |
| | **1** | Hardest natural material so far known is_____ | 1 |
| | **2** | Unit of Tensile strength is_____ | 1 |
| | **3** | Area under stress strain curve is known as_____ | 1 |
| | **4** | Creep can occur at room temperature: True/False | 1 |
| | **5** | What is Stress?. | 1 |
| | **6** | Define Impact strength. | 1 |
| | **7** | What is Strain? | 1 |
| | **8** | Define Tensile strength. | 1 |
| | **9** | Give formula of % Reduction in area. | 1 |
| | **10** | Define Yield strength. | 1 |
| | **11** | Define Fatigue life. | 1 |
| | **12** | Define young's Modulus | 1 |
| | **13** | Define Hardness. | 1 |
| | **14** | Define Resilience. | 1 |
| **Q.2** | **(a)** | Discuss any two factors affecting creep behavior. | **03** |
| | **(b)** | Explain Izod impact test. | **04** |
| | **(c)** | Describe Charpy Impact test. Derive Relationship for energy absorbed by specimen. | **07** |
| | | **OR** | |
| | **(c)** | Define creep. Draw a typical creep curve and explain the various stages in creep. | **07** |
| **Q.3** | **(a)** | Explain the objective of testing of materials. | **03** |
| | **(b)** | Classify methods for testing of material. Describe the criteria for selection of a particular testing method. | **04** |
| | **(c)** | Explain the procedure of tensile testing and draw Stress-strain diagram for brittle and ductile material. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Write a short note on effect of temperature on flow properties. | **03** |
| | **(b)** | Discuss true stress-strain curve. | **04** |
| | **(c)** | Describe importance and method for calibration of any one testing instrument. | **07** |
| **Q.4** | **(a)** | Explain the rebound Hardness test. | **03** |
| | **(b)** | Write a note on Micro Hardness Test. | **04** |
| | **(c)** | Describe the Vicker Hardness Test method with advantages & limitations. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Explain how Scratch Hardness test can be used for testing of hardness of a given sample. | **03** |
| | **(b)** | Write in brief about different Rockwell scales. | **04** |
| | **(c)** | Discuss Brinell Hardness Test Procedure in detail. Mention Limitations. | **07** |

| | | | |
|---|---|---|---|
| **Q.5** | **(a)** | Write a note on yield point phenomena. | **03** |
| | **(b)** | Explain Mechanism of Ductile fracture. | **04** |
| | **(c)** | What are S-N curves. Differentiate ferrous alloys and non - ferrous alloys with reference to their S-N curves. | **07** |

**OR**

| | | | |
|---|---|---|---|
| **Q.5** | **(a)** | Differentiate between ductile and brittle fracture. | **03** |
| | **(b)** | Explain Mechanism of Brittle fracture propagation. | **04** |
| | **(c)** | Describe the important features of fatigue failure. Write a note on fatigue Mechanisms in metals. | **07** |

**********