

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VIII (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2182102

Date: 29/04/2017

Subject Name: Material selection and Failure Analysis

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.

- Q.1** (a) Explain the role of material engineer for selection of materials in Design synthesis. **07**
(b) Short note on factor affecting on cost of basic materials **07**
- Q.2** (a) Explain various criteria for the selection of materials by giving suitable application. **07**
(b) Which are different mechanical properties used for selection of material in engineering use. Explain Strength in detail. **07**
- OR**
- (b) Explain Creep mechanism. On which factors Creep resistance of material depends? Describe various materials used for Creep resistance. **07**
- Q.3** (a) What procedure is follow for failure investigator? **07**
(b) Discuss about bearing materials. **07**
- OR**
- Q.3** (a) Explain macro and micro features of Ductile failure. **07**
(b) Write basic characteristics of brittle failure and explain in brief. **07**
- Q.4** (a) Discuss case study on high temperature metallurgical changes leading to failure of metals. **07**
(b) Explain in brief about Materials used for ship structure and automobile structure. **07**
- OR**
- Q.4** (a) How H₂ embrittlement occur in steel? Explain mechanism of H₂ induced cracking in the steel. **07**
(b) Explain three stages of fatigue failure. Differentiate between strations and beach marks. **07**
- Q.5** (a) Discuss briefly about in service failure by giving suitable example. **07**
(b) Explain the mechanism of stress corrosion cracking in alloys. **07**
- OR**
- Q.5** (a) Discuss case study based on in process failure. **07**
(b) Discuss case study in which failure occur due to Inter granular Corrosion. **07**
