

Code No: 158AZ

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech IV Year II Semester Examinations, July/August - 2022

FAILURE ANALYSIS
(Metallurgical and Materials Engineering)

Time: 3 Hours

Max.Marks:75

Answer any five questions
All questions carry equal marks

- 1.a) What is a fracture? Explain about Griffith crack theory in detail.
b) Discuss in detail about: Fracture criteria and theoretical strength. [7+8]
2. Differentiate between hot working and cold working. What is the effect of cold working on mechanical properties of metals and alloys? [15]
- 3.a) Differentiate between endurance strength and endurance limit with the help of S-N curve.
b) What is creep in metals? Differentiate between primary creep, secondary creep and tertiary creep. [7+8]
4. With help of suitable example, describe the correlation between microstructure and fracture behaviour in materials. [15]
5. Define the term "Fracture toughness". What are the basis modes of crack propagation? Explain with neat sketches. [15]
6. Explain the phenomenon of "Fatigue in metals". Discuss the effect of
a) Stress concentration.
b) Surface residual stresses on fatigue strength. [7+8]
- 7.a) Define Fatigue. Explain the fatigue failure mechanism.
b) Discuss a case study of failure of automobile component. [8+7]
- 8.a) Discuss briefly about in service failure by giving suitable example.
b) Explain the mechanism of stress corrosion cracking in alloys. [7+8]

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