

X

NPTEL

reviewer4@nptel.iitm.ac.in ▼

Courses » Introduction to Materials Science and Engineering

Announcements **Course** Ask a Question Progress FAQ

Unit 15 - Week 12 - Mechanical Behaviour of Materials III + Fracture

Register for
Certification exam

Course outline

How to access
the portal

Supplementary
Materials

Week 1 -
Crystallography
I

Week 2 -
Crystallography
II + Structure of
Solids I

Week 3 -
Structure of
Solids II

Week 4 -
Structure of
Solids III

Week 5 - Defects
in Crystalline
Solids I

Week 6 - Defects
in Crystalline
Solids II

Week 7 - Phase
Diagrams I

Assignment 12

The due date for submitting this assignment has passed.

As per our records you have not submitted this assignment. **Due on 2019-04-24, 23:59 IST.**

1) Choose the correct statement: **1 point**

- Engineering stress is roughly equal to the true stress at lower strains but the difference increases with increasing strain
- Engineering stress is significantly different from true stress at lower strains and the difference increases with increasing strain
- Engineering stress is significantly different from true stress at lower strains but the difference decreases with increasing strain
- Engineering stress is roughly equal to the true stress at all strain levels

No, the answer is incorrect.

Score: 0

Accepted Answers:

Engineering stress is roughly equal to the true stress at lower strains but the difference increases with increasing strain

2) Which of the following materials would creep significantly at 100°C? **1 point**

Material	Tin	Lead	Zinc	Copper	Iron
Melting Point (°C)	232	327	420	1083	1539

- Zn, Sn and Pb
- Zn
- Fe, Cu
- Sn and Pb

No, the answer is incorrect.

© 2014 NPTEL - Privacy & Terms - Honor Code - FAQs -

A project of



NPTEL

National Programme on
Technology Enhanced Learning

In association with

NASSCOM®

Funded by

Week 10 - Phase Transformations II + Mechanical Behaviour of Materials I

Week 11 - Mechanical Behaviour of Materials II

Week 12 - Mechanical Behaviour of Materials III + Fracture

- Week-12 Overview
- 12.1 True stress and True Strain
- 12.2 Creep
- 12.3 Effect of Stress and Temperature on Creep
- 12.4 Creep Mechanisms
- 12.5 Composites
- 12.6 Isostrain Modulus
- 12.7 Isostress Modulus
- 12.8 Fracture
- 12.9 Ductile and Brittle Fracture
- 12.10 Role of Crack Size
- 12.11 Griffith's Criterion
- 12.12 Stress Concentration
- 12.13 Ductile to Brittle Transition
- 12.14 Enhancing Fracture Resistance
- 12.15 Toughening of Glass: Tempering
- 12.16 Toughening of Glass:

- the steady state creep rate is lower and also the creep life will be lower
- the steady state creep rate is lower and the creep life will be higher
- the steady state creep rate is higher and also the creep life will be higher

No, the answer is incorrect.

Score: 0

Accepted Answers:

the steady state creep rate is lower and the creep life will be higher



4) Creep can occur by _____.

1 point

P: diffusion

Q: grain boundary sliding

R: cross-slip of dislocations

- P alone
- P and Q
- P and R
- P, Q and R



No, the answer is incorrect.

Score: 0

Accepted Answers:

P, Q and R

5) The temperature required to initiate creep in a material _____ when the stress is decreased.

1 point

- increases
- decreases
- remains the same

No, the answer is incorrect.

Score: 0

Accepted Answers:

increases

6) A continuous aligned fiber composite is made of E-glass fibres and an epoxy resin matrix. **1 point**
The Young's modulus (in GPa) of the composite along the direction of the fibers is found to be 40 GPa. The Young's modulus of E-glass fiber = 85 GPa and that of epoxy resin = 12 GPa. Find the approximate volume fraction of the fibers.

- 76
- 38
- 22
- 44

No, the answer is incorrect.

Score: 0

Accepted Answers:

38

7) The significant features of a brittle fracture are _____ and _____.

1 point

- low energy absorption, significant plastic deformation
- high energy absorption, significant plastic deformation
- low energy absorption, no significant plastic deformation
- high energy absorption, no significant plastic deformation

Ion-Exchange

 12.17 Fatigue 12.18
Sub-critical
Crack Growth Quiz :
Assignment 12**Interactive
Session****No, the answer is incorrect.****Score: 0****Accepted Answers:***low energy absorption, no significant plastic deformation*

8) A higher surface energy _____ the formation/growth of cracks as the formation/growth of a crack creates new surfaces which _____ the total energy of the system. **1 point**

- resists, increases
- favours, increases
- favours, decreases
- resists, decreases

**No, the answer is incorrect.****Score: 0****Accepted Answers:***resists, increases*

9) During fatigue the crack grows due to _____.

1 point

- constant stress
- cyclic stress
- monotonically decreasing stress
- monotonically increasing load

No, the answer is incorrect.**Score: 0****Accepted Answers:***cyclic stress*

10) Tempering of glass enhances fracture strength of glass by introducing _____.

1 point

- residual compressive stresses in the surface but not inside
- residual tensile stress in the surface but not inside
- residual compressive stress inside but not on the surface
- residual tensile stress both on surface and inside

No, the answer is incorrect.**Score: 0****Accepted Answers:***residual compressive stresses in the surface but not inside*[Previous Page](#)[End](#)

