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

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Course outline

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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.

- 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. 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. ***1 point***

- 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

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 decresing 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

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