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NPTEL

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Courses » Creep deformation of materials

Announcements **Course** Ask a Question Progress FAQ

Unit 4 - Week 2

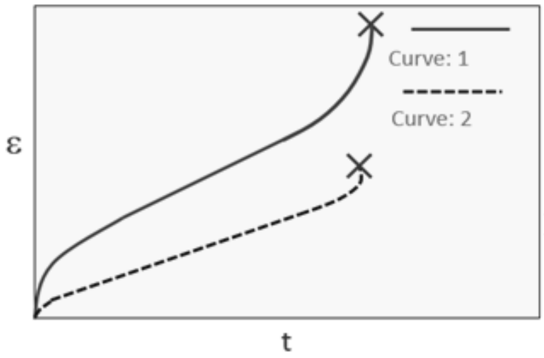
Register for Certification exam

Assignment 2

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2019-02-13, 23:59 IST.

1) Choose the most appropriate answer for the figure shown below *1 po*

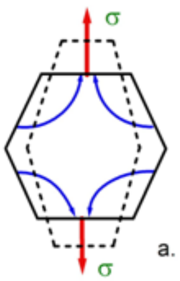


- Curve 1 is demonstrated by materials experiencing an evolution in deformation substructure and curve 2 is demonstrated by materials that have a constant substructure right from the beginning.
- Curve 1 is demonstrated by materials experiencing a reduction in tertiary creep stage and curve 2 is demonstrated by materials that have an increasing tertiary creep regime right from the beginning.
- Curve 1 is demonstrated by materials experiencing a reduction in secondary creep stage and curve 2 is demonstrated by materials that have an increasing primary creep regime
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Curve 1 is demonstrated by materials experiencing an evolution in deformatio substructure and curve 2 is demonstrated by materials that have a constant substructure right from the beginning.

2) Identify the mechanisms of diffusion creep operating in a and b respectively in the Figure below



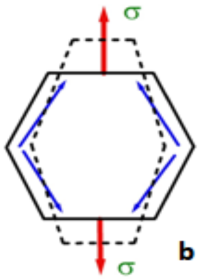
No, the answer is incorrect.
Score: 0

Accepted Answers:

(Type: String) Nabarro-Herring creep
(Type: String) Nabarro-Herringcreep
(Type: String) NabarroHerringcreep
(Type: String) Nabarro Herring creep
(Type: String) NabarroHerring creep
(Type: String) Nabarro Herringcreep

0 points

3) Identify the mechanisms of diffusion creep operating in a and b respectively in the Figure below



No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) Coble creep
(Type: String) Coblecreep

0 points

4) One key difference between class M and class A alloys is ***1 point***

- Class M alloys are glide controlled and class A alloys are climb controlled
- Class M alloys are metallic alloys and class A alloys are amorphous alloys
- Class M alloys are climb controlled and class A alloys are glide controlled
- Both a and b

No, the answer is incorrect.
Score: 0

Accepted Answers:
Class M alloys are climb controlled and class A alloys are glide controlled

5) A criticism of the Andrade equation is that it predicts a creep rate of__________________at the time of loading.

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) Infinity

0 points

6) The mechanism of creep that bears a stress exponent of 1 and a grain size exponent of 0 is_________________________________mechanism.

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) Harper-Dorncreep
(Type: String) Harper Dorn creep
(Type: String) HarperDorn creep
(Type: String) Harper Dorncreep
(Type: String) Harper-Dorn creep
(Type: String) HarperDorncreep

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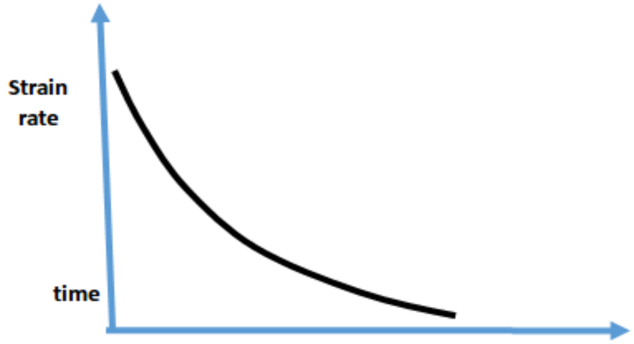
7) If the strain rate vs time plot looks like that shown below, then the mechanism of creep is_______________creep.



No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) exhaustion

1 point

8) The jogged screw model proposed by Barrett and Nix did not work for the creep data generated from ϒ-TiAl because

0 points

- The Barrett and Nix model had an incorrect value of the stress exponent at 7 whereas the creep data from ϒ-TiAl could be explained with a stress exponent of 5.
- The Barrett and Nix model required an activation energy of grain boundary diffusion activation energy whereas the creep data from ϒ-TiAl could be explained with grain boundary diffusion activation energy.
- The Barrett and Nix model required an activation energy of grain boundary diffusion activation energy whereas the creep data from ϒ-TiAl could be explained with grain boundary diffusion activation energy.
- The Barrett and Nix model applies to grain boundary sliding and creep data from ϒ-TiAl corresponded to the power law breakdown regime.

No, the answer is incorrect.
Score: 0

Accepted Answers:
The Barrett and Nix model required an activation energy of grain boundary diffusion activation energy whereas the creep data from ϒ-TiAl could be explained with grain boundary diffusion activation energy.

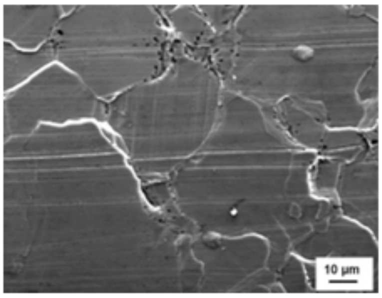
9) The creep parameters n, p and Q stand for **1 point**

- Grain size exponent, stress exponent and activation energy respectively
- Stress exponent, grain boundary exponent and activation energy respectively
- Strain exponent, grain size exponent and temperature exponent respectively
- Stress exponent, grain size exponent and activation energy respectively

No, the answer is incorrect.
Score: 0

Accepted Answers:
Stress exponent, grain size exponent and activation energy respectively

10) The post creep microstructure shown in the figure below indicates deformation controlled by **1 point**



Ref. R Korla, A H Chokshi, Metall. Mater. Trans A, 2014

- Viscous glide creep
- Power law breakdown
- Grain boundary sliding
- Harper-Dorn creep

No, the answer is incorrect.
Score: 0

Accepted Answers:
Grain boundary sliding

11) In first order kinetic reaction, the rate of the reaction is directly proportional to the____________________of the reactant.

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: String) concentration

1 point

12) During creep studies, there is always a risk of phase transformation or change in microstructural length scales due to exposure to high temperature. What would be the correct approach to ensure that the material characteristics such as phases, microstructural length scales such as grain size / interparticle spacing etc do not change? **1 point**

- Heat treat the sample at a test temperature lower than the creep test temperature.
- Plastically deform the material at room temperature and subsequently heat treat the sample at a test temperature higher than the creep test temperature.
- Heat treat the sample at a temperature higher than the creep test temperature.
- Plastically deform the material at room temperature and subsequently heat treat the sample at a test temperature lower than the creep test temperature.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Heat treat the sample at a temperature higher than the creep test tempe

13) A material displayed a strain rate of deformation of 4.5 x 10^{-7} s-1 after a time of 100 h under an applied stress of 45 MPa. What will be the deformation rate after a time of 300 h if the material is displaying a logarithmic creep behavior? *1 po*

$$\varepsilon = \varepsilon_0 + \alpha \ln(1 + \gamma t)$$

- 5.4 x 10^{-7} s^{-1}
- 3.37 x 10^{-7} s^{-1}
- 1.8 x 10^{-8} s^{-1}
- 2.72 x 10^{-7} s^{-1}

No, the answer is incorrect.
Score: 0

Accepted Answers:
2.72 x 10^{-7} s^{-1}

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