> ⊙ **This quiz has been regraded; your score was not affected.**

Quiz 1

Due Sep 30 at 11:59p.m.   **Points** 3.3   **Questions** 10
Available Sep 30 at 12a.m. - Sep 30 at 11:59p.m. 23 hours and 59 minutes
Time Limit 30 Minutes

This quiz was locked Sep 30 at 11:59p.m..

Attempt History

	Attempt	Time	Score	Regraded
LATEST	**Attempt 1**	30 minutes	2.31 out of 3.3	2.31 out of 3.3

Score for this quiz: **2.31** out of 3.3
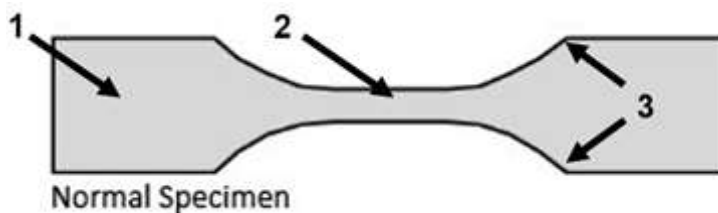Submitted Sep 30 at 10:11a.m.
This attempt took 30 minutes.

Question 1   0.33 / 0.33 pts

This is a standard tensile test coupon. Where on this sample would the strain be the highest?

Correct!

(●) 2

(○) The strain would be the same everywhere

(○) 3

(○) 1

Question 2 0 / 0.33 pts

The stored elastic energy in tempered glass can be roughly related to which of the following?

○ The size difference between the large and small atoms in chemically treated glass

You Answered

◉ The thermal energy used to produce the glass

○ None of the above

Correct Answer

○ The surface energy liberated during fracture

Question 3 0.33 / 0.33 pts

Recall the stress-strain behaviour for an ideal metal, polymer, and ceramic. Which of the following statements are **true**?

○ The final length after elongation for a ceramic material should be larger than a polymeric material

○ The stress achieved before transitioning into the plastic deformation portion of the curve is larger for a polymeric material than a metallic material

○ The final length after elongation for a ceramic material should be larger than a metallic material
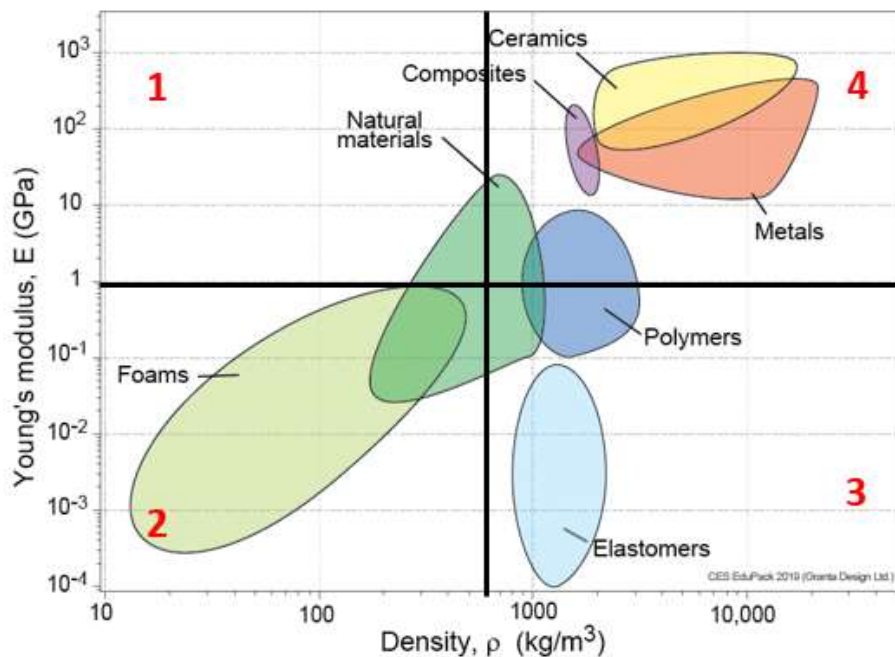
Correct!

◉ The stress achieved before transitioning into the plastic deformation portion of the curve is larger for a metallic material than a polymeric material

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Question 4   0.33 / 0.33 pts

Below is a materials property chart. If we would like to develop a lightweight and very stiff material (for applications such as aerospace), which quadrant would we want to ideally select materials from?

○ 4

Correct!

◉ 1

○ 2

○ 3

Question 5

Original Score: 0.33 / 0.33 pts **Regraded Score: 0.33 / 0.33 pts**

⊙ **This question has been regraded.**

Two cylindrical cross-section tensile specimens are produced from the same material. Sample A has a diameter of 12.9 mm while sample B has a diameter of 19.2 mm. If both samples are loaded by a force of 2800 N and sample A elongates by 250 mm, what will be the elongation of sample B?

○ 225.7 mm

u Answered

⦿ 112.8 mm

○ 451.42 mm

rrect Answer

○ More information is needed to answer the question

Question 6

0.33 / 0.33 pts

Upon unloading of a sample (removing the force acting upon it) that remained within the elastic region of the stress-strain curve, the final length of the sample would be :

○ Longer than the initial length

○ Shorter than the initial length

Correct!

⦿ The same as the initial length

Question 7   0.33 / 0.33 pts

Which of the following is the best definition for the lattice parameter?

Correct!

- ● A characteristic dimension of a unit cell

- ○ The fraction of volume in a crystal that is occupied by atoms

- ○ The anion-cation size ratio

- ○ The distance between two atoms in adjacent crystals

Question 8   0 / 0.33 pts

You are in charge of strength testing a specific ceramic in bending but a miscommunication made it so that the samples from a new batch are two times thicker and twice as long. If these are made of the same material, how does that affect the load needed to break the new samples?

- ○ It remains the same

orrect Answer

- ○ It is two times larger

- ○ It is four times larger

ou Answered

- ● It is eight times larger

Question 9   0.33 / 0.33 pts

If the maximum length that can be reached by applying tension on a 100 cm metal bar before it begins to plastically deform is 100.05 cm. What is the bar made from? Noting that σ_y is engineering stress and E is Young's modulus.

○ Titanium alloy (σy=450 MPa, E=110 GPa)

Correct!

◉ Aluminum (σy=35 MPa, E=69 GPa)

○ Stainless Steel (σy=180 MPa, E=193 GPa)

○ Brass (σy=77 MPa, E=97 GPa)

Question 10	**0 / 0.33 pts**

A metal bar with dimensions of width: 12 mm x height: 35 mm is loaded in uniaxial tension with a force of 70 kN. The total sample length is 40 cm, with a gauge length of 20 cm. Assuming that this material has a Young's modulus of 70 GPa, what would the final length (in cm) of the sample be upon reaching the yield stress? Give only a numerical answer (no units) and round your answer to two decimal places.

ou Answered

40.82

orrect Answers   20.05 (with margin: 0.25)

Quiz Score: **2.31** out of 3.3