

# Unit 5 - Week 4

## Course outline

How does an NPTEL online course work?

Week 1

Week 2

Week 3

Week 4

Processing concepts of ceramics

Mechanical properties of ceramics

Fracture and toughening of brittle solids

Sliding wear of SiC Ceramics

Sliding wear of SiC-WC Composites

Quiz : Assignment 4

Solution For Assignment 4

Week 5

Week 6

Week 7

Week 8

Text Transcripts

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WEEKLY FEEDBACK

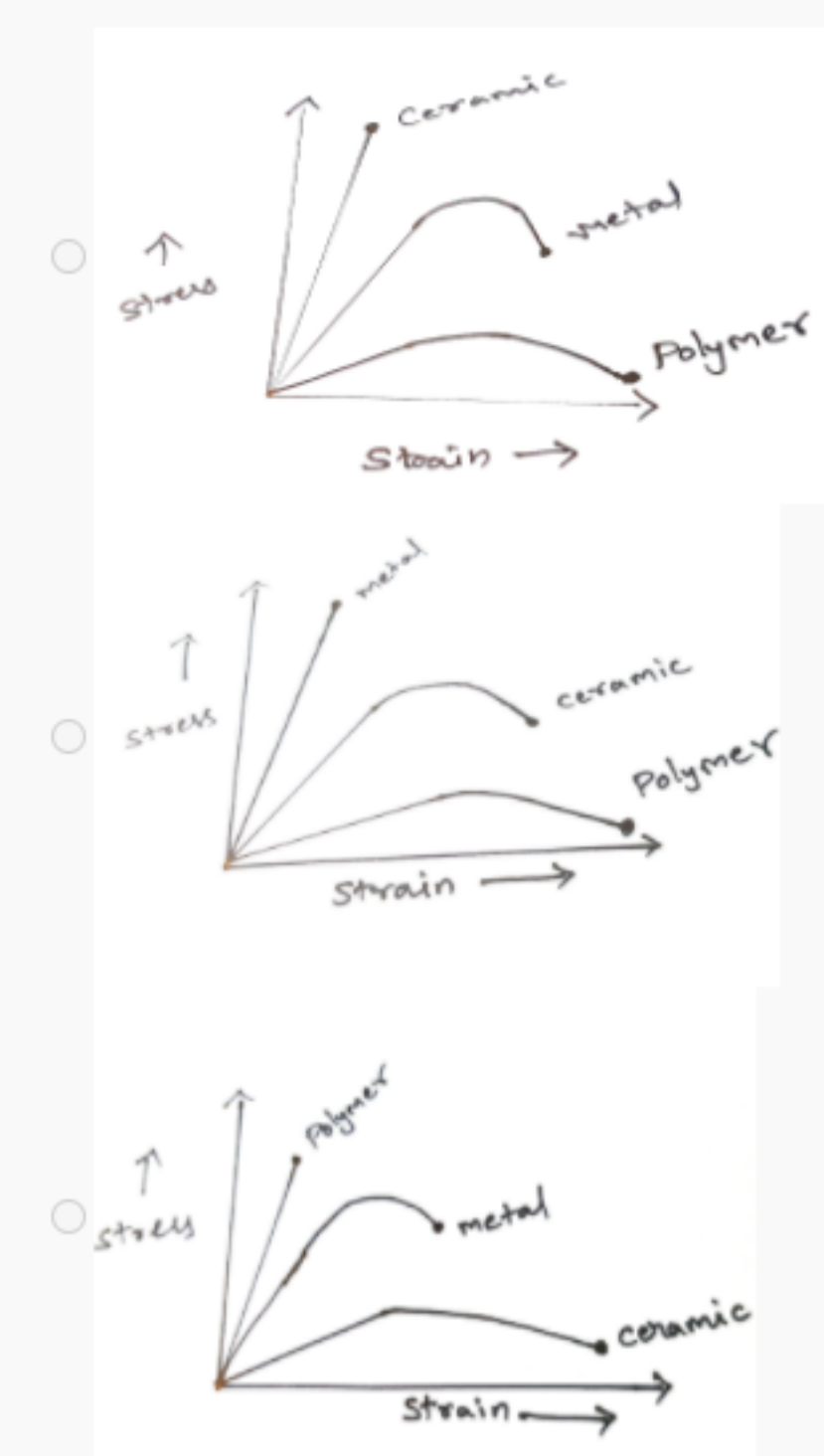
## Assignment 4

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

Due on 2020-02-26, 23:59 IST.

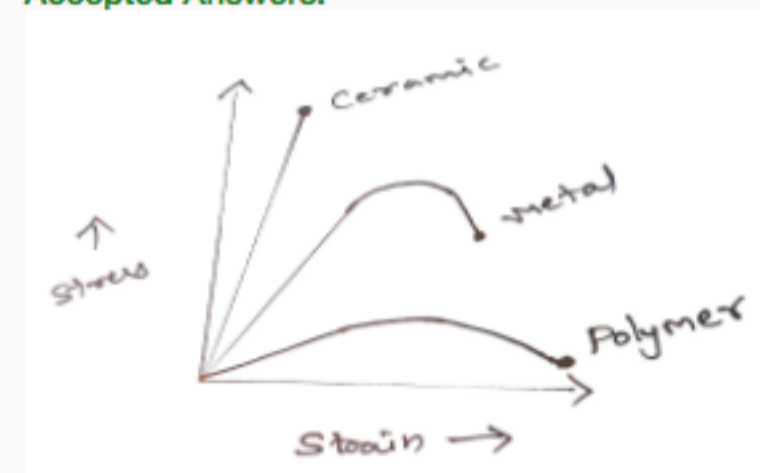
1) Select typical stress-strain plot for ceramic material, metallic material and thermo plastic material

1 point



No, the answer is incorrect. Score: 0

Accepted Answers:



2) Choose correct option from the following for ceramic materials

1 point

- Compressive strength is grater than tensile strength
- Compressive strength is less than tensile strength
- Compressive strength is equal to tensile strength

No, the answer is incorrect. Score: 0

Accepted Answers:

Compressive strength is grater than tensile strength

3) From the following, choose the proper reason for brittleness in ceramics

1 point

- i. ionic bonding
- ii. covalent bonding
- iii. narrow dislocation core width
- iv. more than 5 independent and active slip systems

- i
- ii
- iii
- i and iii
- i,ii and iii
- i,ii,iii and iv

No, the answer is incorrect. Score: 0

Accepted Answers:

i,ii and iii

4) The strength and fracture toughness of a silicon nitride component are 300 MPa and 3.6 MPa.m<sup>0.5</sup>, respectively. Assume Y =1. The maximum size of internal crack which causes no fracture in the component (in micron meters, up to 1 decimal).....

No, the answer is incorrect. Score: 0

Accepted Answers:

(Type: Range) 91.0,92.0

2 points

5) From the following, choose dominant cracking type relevant to wear of ceramic materials

1 point

- a) conical cracking
- b) radial median cracking
- c) lateral cracking
- d) all of the above
- e) b and c

No, the answer is incorrect. Score: 0

Accepted Answers:

e) b and c

6) From the following, select suitable processing technique for ceramics

1 point

- casting
- forging
- powder processing
- rolling

No, the answer is incorrect. Score: 0

Accepted Answers:

powder processing

7) Sintering refers to the consolidation process of powder compacts by diffusional mass transport possible at a temperature (in absolute scale)

1 point

- > 0.5 melting temperature
- < 0.5 melting temperature
- = 0.5 melting temperature
- > melting temperature

No, the answer is incorrect. Score: 0

Accepted Answers:

> 0.5 melting temperature

8) Select the correct option from the following

1 point

1. Heating occurs in SPS by Joule effect
2. Heating occurs in HP by Joule effect
3. Heat and pressure simultaneously applied in HP
4. Compared to SPS, lower temperatures are needed for sintering of powder compacts in pressureless sintering

- 1 and 3
- 1 and 2
- 2 and 4
- 1 and 4

No, the answer is incorrect. Score: 0

Accepted Answers:

1 and 3

9) Wear of SiC ceramics in dry unlubricated sliding conditions increases at high loads due to

1 point

- increased deformation
- increased fracture
- increased deformation and fracture
- none of the above

No, the answer is incorrect. Score: 0

Accepted Answers:

increased fracture