

Unit 3 - Week 1 - Basics of Manufacturing Processes

Course outline

How does an NPTEL online course work?

Week 0

Week 1 - Basics of Manufacturing Processes

- Introduction to Manufacturing Process Technology
- History of Manufacturing Processes and its broad classifications
- Brief Introduction of Non-conventional Machining Processes
- Structure of Matters (Bonding of Solids, Crystal Structures)
- Elastic and Plastic Deformation
- Crystal Imperfection and Dislocation
- Plastic deformation
- Material Properties, Stress-Strain Diagram for Different Types of Materials

Quiz : Assignment 1

Assignment 1 solution

Feedback for week 1

Week 2 - Introduction to casting process

Week 3 - Gating Systems and Rate of solidification

Week 4 - Estimation of solidification time with different conditions and Riser design

Week 5 - Machining Processes

Week 6 - Cutting tool life estimation

Week 7 - Introduction to Micro-Systems Fabrication Technology

Week 8 - Abrasive water jet machining and Ultrasonic Machining

Week 9 - Introduction to Electrochemical Machining

Week 10 - Electro-discharge Machining Process

Week 11 - Laser Beam and Electron Beam Machining Processes

Week 12 - Metal Forming Processes

Text Transcripts

DOWNLOAD VIDEOS

Assignment 1

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

Due on 2020-02-12, 23:59 IST.

1) Which of the following is the most basic structural unit of matter? 1 point

- Atom
- Crystal
- Element
- Molecule

No, the answer is incorrect.
Score: 0

Accepted Answers:
Atom

2) Which of the following is not matched correctly with respect to the manufacturing process and their condition of matter subtraction/addition? 1 point

- Casting → Constant material volume retained
- Machining → Material removal process
- Welding → Material addition process
- Forming → Material addition process

No, the answer is incorrect.
Score: 0

Accepted Answers:
Forming → Material addition process

3) Which of the following statement is true corresponding to the bonding of solids? 1 point

- Attractive force results between two nuclei.
- Repulsive force results between atoms.
- Attractive force increases with the decrease in distance between the two entities.
- All of the above statements are true.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Attractive force increases with the decrease in distance between the two entities.

4) Which of the following is not true corresponding to Van der Waals forces? 1 point

- These are intermolecular forces.
- The forces are proportional to d^4 .
- These are weaker than the other bonding forces.
- These forces are attributed to the rapidly fluctuating dipole moments.

No, the answer is incorrect.
Score: 0

Accepted Answers:
The forces are proportional to d^4 .

5) How many number of atoms are present per unit cell in case of BCC crystal structure? 1 point

- 2
- 3
- 4
- 1

No, the answer is incorrect.
Score: 0

Accepted Answers:
2

6) If the radius of an atom in a close-packed hexagonal crystal is r , the length of the edge of the unit cell, a is: 1 point

- $r/2$
- $2r/3$
- $2r$
- $r/4$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $2r$

7) Which of the following properties in a solid depends on its crystal structure? 1 point

- Yield stress
- Work hardening
- Ductility
- Creep

No, the answer is incorrect.
Score: 0

Accepted Answers:
Ductility

8) True strain, ϵ in terms of engineering strain, e is given by: 1 point

- $\epsilon = \ln (1 - e)$
- $\epsilon = \ln (1 + e)$
- $\epsilon = \ln (2 + e)$
- $\epsilon = \ln (2 - e)$

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $\epsilon = \ln (1 + e)$

9) Which of the following property is measured by calculating the area under the stress-strain curve? 1 point

- Hardness
- Endurance
- Strength
- Toughness

No, the answer is incorrect.
Score: 0

Accepted Answers:
Toughness

10) The property of a material by which it can be beaten or rolled into thin sheets is called: 1 point

- Elasticity
- Ductility
- Malleability
- Plasticity

No, the answer is incorrect.
Score: 0

Accepted Answers:
Malleability

11) Which among the following is the best characteristic that a perfectly elastic body holds? 1 point

- It has a perfectly smooth surface.
- It completely recovers its original size and shape when the deforming force is removed.
- It can move freely.
- It cannot be deformed by any external surface.

No, the answer is incorrect.
Score: 0

Accepted Answers:
It completely recovers its original size and shape when the deforming force is removed.