

Unit 4 - Week 3

Course outline

How does an NPTEL online course work?

Week 1

Week 2

Week 3

● Overview of tribological materials

● Friction and wear of metal matrix composites

● Overview: Bioceramics and Biocomposites

● Fabrication of engineering polymers

○ Polymer Ceramic Composites for Orthopedic Applications

○ Quiz : Assignment 3

● Solution For Assignment 3

Week 4

Week 5

Week 6

Week 7

Week 8

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WEEKLY FEEDBACK

Assignment 3

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

Due on 2020-02-19, 23:59 IST.

1) Select proper arrangement of materials in increasing order of Hertzian stress in self-mated sliding conditions

1 point

- Polymers, metals, ceramics
 Metals, polymers, ceramics
 Ceramics, metals, polymers
 Ceramics, polymers, metals

No, the answer is incorrect.
Score: 0

Accepted Answers:
Polymers, metals, ceramics

2) The fracture toughness of bone depends on

1 point

- Bone thickness
 Bone length
 Bone density
 None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Bone density

3) Select proper combination of properties for a given ceramics to use in tribological applications

1 point

- High hardness, high modulus, low density and low compressive strength
 High hardness, high compressive strength, high modulus and low density
 High hardness, high modulus and low density
 High compressive strength, high modulus and low density

No, the answer is incorrect.
Score: 0

Accepted Answers:
High hardness, high compressive strength, high modulus and low density

4) The formation of stable dense hydrous magnesium silicate (DHMS) layer in Mg-SiC composites

1 point

- reduce COF
 increase COF
 does not cause change in COF

No, the answer is incorrect.
Score: 0

Accepted Answers:
reduce COF

5) Select proper application - suitable material combination from the following:

1 point

- Femoral ball --- TiCN-Co cermets
 Cutting tool insert --- HDPE
 Mechanical seal--- Aluminium
 Dental restoration--- Zirconia

No, the answer is incorrect.
Score: 0

Accepted Answers:
Dental restoration--- Zirconia

6) In vivo tests provides

1 point

- interactions of different cell types
- effects of hormonal factors
- interactions with extracellular matrix
- interactions with blood-borne cells, proteins and molecules

- only 1
 1 and 2
 1, 2 and 3
 1, 2, 3 and 4

No, the answer is incorrect.
Score: 0

Accepted Answers:
1, 2, 3 and 4

7) Select proper polymer-ceramic composite for orthopaedic application from the following

1 point

- HDPE-HAp-Al₂O₃
 HDPE-HAP-SiC
 HDPE-HAp-FeO
 HDPE-HAp-Nb₂O₃

No, the answer is incorrect.
Score: 0

Accepted Answers:
HDPE-HAp-Al₂O₃

8) Major constituents in natural bone are

1 point

- HAp-collagen-H₂O-proteins
 HAp-HAp-H₂O-Proteins
 HAp-collagen-H₂O₂-minerals
 HAp-H₂O-minerals

No, the answer is incorrect.
Score: 0

Accepted Answers:
HAp-collagen-H₂O-proteins

9) Polymerization is the process of combining many monomers into a bonded chain.

1 point

- ionically
 covalently
 Van der Waals
 metallic

No, the answer is incorrect.
Score: 0

Accepted Answers:
covalently

10) Select proper combination of 3D Printing process parameters from the following

1 point

- powder size distribution
 powder shape
 powder flowability
 powder wettability with binders
 a and b
 a, b, c and d

No, the answer is incorrect.
Score: 0

Accepted Answers:
a, b, c and d