

Unit 3 - Defining tissue engineering scaffolds and implants

Course outline

How to access the portal

Week 1 Introduction to Biomaterials and Biocompatibility

Defining tissue engineering scaffolds and implants

Tissue Engineering

Scaffolds

Bone structure

Bone properties

Implant-I

Implant-II

Quiz : WEEK 2 ASSIGNMENT

Structure and Properties of Proteins and Cells

Stem cells and Cell fate processes

Cell-material Interaction (in vitro and in vivo) and Clinical trials

Manufacturing of Biomaterials (metals, ceramics and polymers)

HA-based Composites

Glass ceramics for orthopedic and dental applications, acetabular socket and femoral head, prototype development

Text Transcripts

WEEK 2 ASSIGNMENT

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

Due on 2019-08-21, 23:59 IST.

1) An implant is suitable for use in humans if it is 1 point

- tested *in vitro*
 sterile
 tested *in vivo*
 passed through clinical trials

No, the answer is incorrect.
Score: 0

Accepted Answers:
passed through clinical trials

2) Critical size defect of bone means the defect is 1 point

- round
 square
 2-3 times longer than the diameter
 2-3 times shorter than the diameter

No, the answer is incorrect.
Score: 0

Accepted Answers:
2-3 times longer than the diameter

3) In long bones, bone marrow is surrounded by numerous 1 point

- blood vessels
 osteons
 nerves
 lipids

No, the answer is incorrect.
Score: 0

Accepted Answers:
osteons

4) Stoichiometric formula of Hydroxyl apatite is 1 point

- $\text{Ca}(\text{OH})_2$
 $\text{Ca}_3(\text{PO}_4)_2$
 $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$
 None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
 $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$

5) Osteons show a regular arrangement of Hydroxyapatite (HA) crystals of size 1 point

- 50-100 nm
 500-1000 nm
 5-10 micron
 5-10 nm

No, the answer is incorrect.
Score: 0

Accepted Answers:
50-100 nm

6) Bone is a tissue that belongs to the class 1 point

- muscular
 connective
 nervous
 cardiovascular

No, the answer is incorrect.
Score: 0

Accepted Answers:
connective

7) Ratio of stress and strain that a material can undergo without undergoing deformation is defined by its 1 point

- Elastic modulus
 Strength
 Ductility
 Fracture strength

No, the answer is incorrect.
Score: 0

Accepted Answers:
Elastic modulus

8) Smallest structure-function unit in the bone is 1 point

- bone matrix
 osteon
 Haversian canals
 Volkmann canals

No, the answer is incorrect.
Score: 0

Accepted Answers:
osteon

9) Percentage of mineralized phase in bone is 1 point

- 10-20%
 20-30%
 60-70%
 30-40%

No, the answer is incorrect.
Score: 0

Accepted Answers:
60-70%

10) Water content in the bone is approximately 1 point

- 30 wt.%
 50 wt.%
 90 wt.%
 10 wt.%

No, the answer is incorrect.
Score: 0

Accepted Answers:
10 wt.%

11) Compressive strength of a scaffold depends on 1 point

- Biomaterial Composition
 Processing Technique
 Scaffold porosity
 All of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
All of the above

12) Bone density depends on 1 point

- Bone size
 Mineral content
 Bone length
 None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Mineral content

13) Two major components of bone are 1 point

- Collagen and Ti
 Collagen and HA
 Fibrinogen and HA
 HDPE and HA

No, the answer is incorrect.
Score: 0

Accepted Answers:
Collagen and HA

14) Among steel, Ti and Co-Cr-Mo based metallic biomaterials, the most biologically inert in terms of corrosion resistance in clinically relevant potential range is 1 point

- Stainless Steel
 Ti based alloys
 Co-Cr-Mo
 None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Ti based alloys

15) _____ is defined as a direct structural and functional connection between ordered, living bone and the surface of a load-bearing implant. 1 point

- Osseinduction
 Osseointegration
 Osseconduction
 All of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Osseointegration