Bioengineering TEST

1.The human skeletal system consists of:

(1/1 punkt)

bones, cartilage, tendons, and ligaments

bones, muscles, tendons, and ligaments

bones, cartilage, muscles, and ligaments

2.The liver:

(1/1 punkt)

helps to digest food

removes poisons from the blood

absorb nutrients from food

3.Implant:

(1/1 punkt)

A device that is placed into a surgically or naturally formed cavity of the living body if it is intended to remain there for a period of 100 days or more

A material that is placed into a surgically or naturally formed cavity of the living body if it is intended to remain there for few days

A device that is placed into a surgically or naturally formed cavity of the living body if it is intended to remain there for a period of 30 days or more

4.X-ray attenuation depends on:

(1/1 punkt)

wavelength

material atomic number

material mass density

material thickness

all of the above

5.Which particles are used in hyperthermia?

(1/1 punkt)

PLGA (polymer)

pure silica (ceramic)

gold (metal)

6.Increasing the rate of deformation of bone leads to:

(0/1 punkt)

an increase in its stiffness,

a decrease in its stiffness

does not affect the stiffness of the bone,

7.Fixation plates could be made of:

(0/1 punkt)

PLA and PLGA and Ti and Mg

PLA and PLGA and Ti and Al2O3

PLA and PLGA and Ti and ZrO2

8.Single-photon emission computed tomography (SPECT) uses:

(1/1 punkt)

X-rays

Gamma rays

Piezoelectric effect

9.Which method to best for bone investigation:

(1/1 punkt)

MRI

Ultrasonography

CT

10.Huiskes model is used for prediction of:

(1/1 punkt)

bone remodeling process

osteoporosis

cell differentiation

11.Osteolysis is biological response to:

(0/1 punkt)

Wear particles

Implant roughness

Bone cement

12.What is the drug release mechanism from a biodegradable polymeric carrier?

(1/1 punkt)

1. diffusion

2. degradation

3. both mentioned above

13.The proper definition of hydrogel is:

(1/1 punkt)

Hydrophilic polymeric networks that can absorb water without dissolving

Hydrophobic polymeric networks that can absorb water without dissolving

Hydrophilic polymeric networks that can absorb water with dissolving

14.Osteointegration is better for:

(1/1 punkt)

Cemented implants

Implants coated with HAp

Polished implants

15.Insert in total knee endoprosthesis is made of:

(1/1 punkt)

Ti

UHMWPE

CoCrMo

16.Biosensor consists of:

(0/1 punkt)

Analyte -> Bioreceptor -> Transducer ->Electronic system

Sample -> Bioreceptor -> Transducer ->Electronic system

Analyte -> Transducer ->Bioreceptor -> Electronic system

17.Wolff's law describes:

(1/1 punkt)

change in bone conductivity under mechanical load

the adaptation mechanism of bone architecture

the phenomenon of pathological resorption of bone

18.One of the mechanical stimuli of the bone remodeling process is considered to be:

(0/1 punkt)

stiffness of the tissue

octahedral strain

thermal conductivity coefficient of the tissue

19.What can show a CT that an MRI scan cannot?

(1/1 punkt)

Brain

Bone

Cartilage

20.Which statement fits with microCT:

(1/1 punkt)

non-destructive method

allows quantitative and qualitative 3D analysis

allows 3D visualisation

allows numerical analysis like Finite Element Analysis

allows reverse engineering

all of the above

21.Electromyography will not be helpful for:

(0/1 punkt)

a) identification of the muscle electrical activity

b) identification of the muscle's electrical resistance

22.Osteosynthesis is defined as:

(1/1 punkt)

fixation of a bone

fixation of a cartilage

fixation of a muscle and tendon

23.Viscoelastic behavior of biological tissues could not be described by:

(1/1 punkt)

Kelvin-Voigt model

Maxwell's equations

24.Which particles are used in hyperthermia?

(1/1 punkt)

1. PLGA (polymer)

2. pure silica (ceramic)

3. gold (metal)

25.What is the drug release mechanism from a biodegradable polymeric carrier?

(1/1 punkt)

diffusion

both mentioned above

degradation

26.Which DDS provides the highest concentration of an antibiotic in the infected tissue, when the same total dose is applied?

(0/1 punkt)

1. orally administrated pill

2. intravenous injection

3. locally applied antibiotic loaded sponge

27.CFR-PEEK is:

(1/1 punkt)

Carbon-Fiber-Reinforced polyetheroethero-ketone

Carbon-Fiber-Reinforced polyetherether-ketone

Carbon-Fiber-Reinforced polyethylenoethero-keton

28.Young’s Modulus for:

(1/1 punkt)

Stainless steel < Co-Cr Alloy < Titanium < Ti6Al4V

Ti6Al4V< Stainless steel < Co-Cr Alloy < Titanium

Titanium < Ti6Al4V< Stainless steel < Co-Cr Alloy

29.The finite element method could be a useful tool for the identification of:

(1/1 punkt)

the stress state

phylogenetic trees

30.Temporary hip spacer is made of:

(0/1 punkt)

PLA

PLGA

PMMA

31.Which DDS provides the highest concentration of an antibiotic in the infected tissue, when the same total dose is applied?

(0/1 punkt)

orally administrated pill

intravenous injection

locally applied antibiotic loaded sponge

32.The location of the human body center of gravity is invariable:

(1/1 punkt)

true

false

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