

Al-Mustansiriyah University
Faculty of Engineering
Materials Eng. Dept.
graduate (B.Sc.)
Name :



Subject: Select of materials
Max. Time: one hour
Class:4st
Date: 26 /04 / 2017

الاسم :

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2017

Max.Mark 15 %

Q1: Choose the right answer from the following multiple choice : [3 Marks]

- 1- ----- is used for large arteries. (a- LLDPE , b- Dacron , c- PMMA , d- PVC)
- 2- The properties and design requirements of cardiovascular is -----
(a- good adhesion , b- high allergenicity , c- lubricity , d- good integration with bones)
- 3- ----- is one of application of piezoelectric materials such as Atomic force microscopes .
(a- sensor , b- Surgery , c- Reduction of noise , d- actuator)
- 4- The important characteristics for sutures -----
(a- flexibility , b- good hardness , c- shape effect , d- high modulus , f- impact resistance)
- 5- ----- in case of polymer composite causes a reduction in stiffness .
(a- bioactivity , b- fatigue load , c- impact load , d- Water absorption)
- 6- The dental composites such as polymer matrix filled with -----
(a- barium glass , b- perlon , c- fiber glass , d- carbon fiber)

Q2: Explain :

(answer 6 only)

[3 Marks]

- 1- Effect of contact time on the bio materials devices .
- 2- The factors that are largely affected to the properties of biomedical composites represent .
- 3- Thermosetting biopolymer used in orthopedics such as hip replacements.
- 4- Titanium alloys should not be used in knee joint .
- 5- Although the (Co Cr) ALLOYS has the highest strength/wear resistance respect to the stainless steel (316L) but it is not used in the fixation plate design .
- 6- Rubber gloves are usually filled with very fine particles of silica .
- 7- Bioinert ceramic is used for knee prostheses and dental implants

Q3: Select suitable bio materials for following application

[3 Marks]

- 1- Metal artificial eardrum
- 2- Filling spaced vacated by bone screws.
- 3- High voltage and power sources materials .
- 4- medical application of shape memory alloys .
- 5- polymer Cardiovascular
- 6- membranes for blood dialyzer .

Q4- Give example of following applications:

[3 Marks]

- 1- Electrical Stimuli
- 2- Bio application has high wear resistance
- 3- long Contact time (greater than 30 years) of bio application .
- 4- high Flexibility.
- 5- *Sound transmission* .
- 6- *High wear resistance*

Q5. Answer each of the following with True or False .

[3 Marks]

- 1- The Ti6Al4V alloy has some disadvantages such as its modulus of elasticity ≥ 4 to 6 times of cortical bone
- 2- The advantages of bio-composite materials have high fracture toughness.
- 3- Quartz exhibits piezoelectricity several times lower than PVDF.
- 4- The inverse piezoelectric effect is used in the production of ultra violet .
- 5- The Advantages to Bio ceramics is : high thermal conductivity .
- 6- In Shape memory alloys , the martensite is the parent phase and exhibits a (cubic) crystalline structure .

Good Luck

