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Question Paper Code:U2P04

B.E./B.Tech. DEGREE EXAMINATION, MAY 2022

Second Semester

Biotechnology

21UPH204 - Biomaterial Physics

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- Bio Materials –Second Generation CO1-U
(a) 1950-69 (b) 1970-80 (c) 2000 to till date (d) 1960-70
- Bio ceramics CO1- U
(a) Copper (b) PMMA (c) Aluminum oxide (d) PVA
- Ti-6Al-4V alloys is called? CO1-U
(a) Metallic (b) Steel (c) Stainless steel (d) ceramics
- Bioactive ceramics CO1-U
(a) Carbons (b) Ceramics
(c) Calcium Phosphate Ceramics (d) Low carbon content
- The group of metallic alloys which demonstrate the ability to return to their original shape or size CO1- U
(a) SMA (b) Metallic (c) Nano (d) Diamagnetic
- Nitinol CO1- U
(a) SMA (b) Nano (c) Ceramics (d) Glass
- How many lattice types involved in crystal systems CO1-U
(a) 10 (b) 14 (c) Unitcell (d) atoms
- Determination of molecular structure of any compound by CO1-U
(a) NMR (b) XRD (c) EPR (d) AAS

9. Composites(carbon-carbon, wire or fiber reinforced bone cement includes CO3-Ana
 (a) Joint implants (b) heart valves (c) Both (a & b) (d) None of the above
10. Zirconia (ZrO_2) is a CO1-U
 (a) Bone (b) blood vessels (c) hip socket (d) All of the above

PART – B (5 x 2= 10Marks)

11. Define Bio resorbable. CO1-U
12. Define Bio-compatibility. CO1-U
13. Distinguish between Austenite and martensite phase in SMA's. CO3-Ana
14. How is the wavelength controlled in an FTIR spectrometer? CO1-U
15. What are the thermal properties of implant materials? CO2-Ana

PART – C (5 x 16= 80Marks)

16. (a) Discuss in details about Bio materials with suitable Examples CO1- U (16)
 Or
 (b) Write an essay about the classification of Biomaterials and their applications CO2- Ana (16)
17. (a) Discuss in detail about Titanium and its Alloys CO1- U (16)
 Or
 (b) Discuss in detail about ceramics ceramic and Polymer implant materials. CO1-U (16)
18. (a) Discuss in detail about Shape memory alloys with examples. CO1- U (16)
 Or
 (b) What are nano materials? Describe any two methods of production of nano materials. Discuss the applications of nano materials. CO1-U (16)
19. (a) Discuss in detail about FTIR Spectrometer? CO1-U (16)
 Or
 (b) Discuss in detail about Neutron diffraction with examples CO1-U (16)
20. (a) Explain in detail about implant materials with examples. CO1-U (16)
 Or
 (b) Explain in detail about Biomaterials application with examples CO1-U (16)