A **Reg. No. :** | | | | | | | | | | | | |

Question Paper Code:U2P04

B.E./B.Tech. DEGREE EXAMINATION, NOV 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)

1. Bio Materials –Second Generation CO1-U

   (a) 1950-69 (b) 1970-80 (c) 2000 to till date (d) 1960-70

2. Bio ceramics CO1- U

   (a) Copper (b) PMMA (c) Aluminum oxide (d) PVA

3. Acceptance of an artificial implant by the surrounding tissues. CO1-U

   (a) Bio-compatibility (b) Implant materials (c) Biological materials (d) Bio Materials

4. Bioactive ceramics CO1-U

   (a) Carbons (b) Ceramics

   (c) Calcium Phosphate Ceramics (d) Low carbon content

5. 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

6. Nitinol CO1- U

   (a) SMA (b) Nano (c) Ceramics (d) Glass

7. How many lattice types involved in crystal systems CO1-U

   (a) 10 (b) 14 (c) Unitcell (d) atoms

8. 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. Ceramics(aluminum oxide, calcium phosphates including CO1-U

(a) Dental (b) Joint implants (c) Both (a & b) (d) None 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) What are Biomaterials? Explain the different types of Biomaterials and their application in medical field. CO1- U (16)

Or

(b) Write an essay about the classification of Biomaterials and their applications CO2- Ana (16)

17. (a) Discuss in detail Metallic implant materials CO1- U (16)

Or

(b) Discuss in detail about ceramics ceramic and Polymer implant materials. CO1-U (16)

18. (a) Select a suitable method for production of metallic glasses and analyze the properties and applications of amorphous metal. CO2- Ana (16)

Or

(b) Describe the mechanical ,chemical and magnetic properties of nano materials and also details in Sol-gel method. 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 joint replacement materials CO1-U (16)

Or

(b) Explain in detail about Biomaterials application with examples CO1-U (16)