

Reg. No. :

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Question Paper Code: UB101

B.E./B.Tech. DEGREE EXAMINATION, NOV 2024

Professional Elective

Biomedical Engineering

21BMV101 BIOMATERIALS, ARTIFICIAL ORGANS AND IMPLANTS

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer All Questions

PART A - (10x 2 = 20 Marks)

1. Define Hooke's law. CO1- U
2. What are the different types of stresses. CO1- U
3. Summarize the mechanical property requirement of CoCr alloy. CO1- U
4. Define stress and give its types. CO1- U
5. State tissue engineering. CO1- U
6. Give the criteria for biomaterials selection. CO1- U
7. Identify various connective materials used for joint tissue replacements. CO1- U
8. Define Extra cellular matrix. CO1- U
9. Write the importance of cross matching and blood typing before a transfusion. CO1- U
10. List down the primary types of organ transplants. CO1- U

PART – B (5 x 16= 80Marks)

11. (a) Analyze the factors influencing the efficiency of shape memory alloys. CO4 - Ana (16)
Or
(b) Analyze the properties of different biomaterials employed for prosthetic limb. CO2 -Ana (16)
12. (a) Analyze the factors influencing the efficiency of condensation polymerization, such as temperature, pressure, and catalysts. CO 4- Ana (16)
Or
(b) Analyze the potential risks associated with long-term exposure to CO 4- Ana (16)

mutagenic substances

13. (a) Explain the fundamental principles behind the design of implants, including their purpose and how they address specific clinical needs. CO1- U (16)
- Or
- (b) Explain the role of the immune system in the biocompatibility of implants and how it affects the integration and functionality of the device. CO1- U (16)
14. (a) Explain the role of the extracellular matrix in supporting and organizing cells within tissues. CO1-U (16)
- Or
- (b) Explain the factors that are considered when selecting materials and methods for maxillofacial augmentation, such as patient-specific anatomical and functional needs. CO1-U (16)
15. (a) Examine the impact of organ replacement on the overall health and quality of life of patients, and identify the key factors influencing these outcomes. CO4 -Ana (16)
- Or
- (b) Analyze the long-term effects of immunosuppressive drugs on kidney transplant recipients and how they influence overall patient health. CO4 -Ana (16)