



SCHOOL OF HEALTHCARE SCIENCE AND ENGINEERING
CONTINUOUS ASSESSMENT TEST -I
FALL SEMESTER 2025-2026

SLOT:C1+TC1

Programme Name & Branch : B.Tech in Health Sciences and Technology
Course Code : BHST302L
Course Name : Materials in healthcare
Faculty Name(s) : Prof. Geetha Manivasagam
Class Number(s) : VL2025260100965
Date of Examination : 19-Aug-2025
Exam Duration : 90 minutes
Maximum Marks: 50

General instruction(s):

1. All questions are compulsory.
2. Read each question carefully before answering.
3. Write your answers neatly and legibly in the space provided / in the answer booklet.
4. Use only blue or black ink; diagrams may be drawn in pencil.
5. Write the correct question number before each answer.
6. Mobile phones, smart watches, and other electronic devices are strictly prohibited in the examination hall.
7. Manage your time wisely to attempt all questions within the allotted time.
8. Do not write your name or any identifying marks on the answer sheet.

Q. No	Question	Marks	Course Outcome (CO)	Bloom's Taxonomy (BL)
1.	Draw a representative human anatomy and schematically represent where metals, polymers, ceramics, and composites are used. Also, justify why these materials are used for the specified tissue or organ.	05	CO1: Know the different types of biomaterials and their healthcare applications.	BL1, BL2
2.	A 12-year-old girl has suffered a road traffic accident resulting in damage to several tooth crowns and hip. What types of implant materials would be appropriate to restore the functionality of her damaged teeth and hip? Additionally, what key criteria should be considered in the selection of these materials for a growing child?	10	CO1: Know the different types of biomaterials and their healthcare applications. CO2: Recognize the bulk and surface properties of the biomaterials for the selection of healthcare applications.	BL3



VIT

Vellore Institute of Technology
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3.	Write Young's equation for contact angle, and how do you use this equation to define wettability profiles, and also describe how you will tailor the surface of a cardiac implant in terms of wettability, such that you prevent blood protein adhesion and prevent thrombosis.	10	CO2: Recognize the bulk and surface properties of the biomaterials for the selection of healthcare applications.	BL2, BL3
4.	What is the stress-shielding effect, and why is it difficult for metals to behave like a bone?	10	CO2: Recognize the bulk and surface properties of the biomaterials for the selection of healthcare applications.	BL1
5.	Briefly write how roughness, electrical charge, and texture affect the cell adhesion, proliferation, and differentiation.	10	CO4: Identify the host's response to these biomaterials..	BL2
6.	Given a coated material, how would you identify the phases, topography, and chemical composition, and elucidate the governing principle of one of the techniques?	05	CO3: Identify the characterization techniques of the biomaterials	BL3, BL4
