



CBCS SCHEME

21BT752

Seventh Semester B.E./B.Tech. Degree Examination, June/July 2026 Biosensors and Applications

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain the construction and functioning of electrochemical biosensors. (10 Marks)
- b. Analyze the role of biosensors in integrated environmental monitoring systems. (10 Marks)

OR

- 2 a. Define Biosensors. Classify them based on biological recognition elements. (10 Marks)
- b. Illustrate biosensor applications in the food industry using case - studies. (10 Marks)

Module-2

- 3 a. List common biomolecules used in biosensors and their functions. (10 Marks)
- b. Describe the mechanism of antibody – based biosensors with an example. (10 Marks)

OR

- 4 a. Explain the principle of Surface Plasmon Resonance (SPR) in biosensing. (10 Marks)
- b. Design a DNA – based biosensor for virus detection and justify each component. (10 Marks)

Module-3

- 5 a. Define Bio – affinity. Differentiate between labeled and label – free detection. (10 Marks)
- b. Describe the use of mammalian cells in whole – cell sensing applications. (10 Marks)

OR

- 6 a. Discuss response time and stability in the context of biosensor performance. (10 Marks)
- b. Evaluate the effects of cost , reproducibility and simplicity on biosensor commercialization. (10 Marks)

Module-4

- 7 a. Define UV – Vis absorption. How it is applied in biosensing? (10 Marks)
- b. Explain the principle of colorimetric biosensors with examples. (10 Marks)

OR

- 8 a. Describe redox reactions and their role in biosensor signal generation. (10 Marks)
- b. Compare the use of magnetic labeling and impedance spectroscopy in biosensors. (10 Marks)

Module-5

- 9 a. Discuss the use of yarn – based wearable biosensors in continuous health monitoring. (10 Marks)
- b. Design a point – of – care device for infectious disease diagnosis with schematic components. (10 Marks)

OR

- 10 a. Explain microfabricated sensors used for real – time viral detection. (10 Marks)
- b. Critically evaluate the integration of mobile biosensors with IoT in digital healthcare. (10 Marks)

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