

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -1 EXAMINATIONS-2022
M.Sc-III Semester (Microbiology)

Course Code (Credits): 21MS2MB312(3)

Max. Marks: 15

Course Name: Biosensors: Principle And Applications

Course Instructors: Dr. Abhishek

Max. Time: 1 Hour

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

- Q1. A researcher working on a disease and trying to develop a biosensor against the same condition, later on, the researcher identified the genetic sequence of bio-analyte mainly responsible for this disease [5'- ATGCATCAGCTAGGGCATCGACTG-3']. What will be the genetic sequence of the bio-receptor he will use to selectively identify the concerned analyte and how will he immobilize the receptor over the surface of the transducer? [4]
- Q2. Calculate the electrode potential at a zinc electrode dipped in a 0.01M solution of zinc sulphate at 25°C. The standard potential of Zn/Zn⁺² systems is -0.34 volt at 298 K. [3]
- Q3. Applications of sensors are increasing day by day especially in medical field's e.g glucose biosensors. Such biosensors provide quick response to tell if the analyte concentration is high or low and also allows the patient to see if drug or other medications working or not. In the same line designing of biosensors required various component viz. Bio-analyte, transducer display unit etc. Write down the importance of the following component (a) antibody (b) Enzyme (c) absorptions and fluorescence transducer (d) Electrochemical Transducer [5]
- Q4. There are laboratory tests and protocols for the detection of various biomarkers, which can be used to diagnose heart attack, stroke, cancer, multiple sclerosis, or any other conditions. However, these laboratory protocols often require costly equipment, and skilled technical staff, and hospital attendance and have time constraints. Biosensors emerge as a potential alternative to overcome the above limitations, explain how? Also write down the important features of biosensors in term of economic factors, environmental factors and sensors characteristics [3]