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[A-121]

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SARDAR PATEL UNIVERSITY
M. Sc. Integrated Biotechnology (IGBT) 6th Semester
Monday, 4th April 2016
2:30 pm to 5:30 pm
PS06CIGB04 – Biosensors and Biocrystallography

Maximum Marks: 70

Note: 1) All the Questions are compulsory.
2) Figures on the right indicate marks.

Q.1 Choose the correct option.

1x8= 8

- (1) Self generating type transducers are _____ transducers
 (a) Active (b) Passive (c) Inverse (d) Secondary
- (2) RTD issensor.
 (a) thermo-electric (b) electro-thermal
 (c) thermo- magnetic (d) thermo-mechanical
- (3) Urease biosensor isbiosensors.
 (a) amperometric (b) potentiometric
 (c) calorimetric (d) none of these
- (4) In second generation biosensor, which of the following is not a mediator.....
 (a) TCNQ (b) Ferrocene (c) Acrydine orange (d) None of these
- (5) Purity of an enzyme at various stages of purification is best measured by..... of enzyme
 (a) total activity (b) specific activity (c) percent recovery (d) None of these
- (6) Optical isomer/ Enantiomers occur due to the presence ofcarbon.
 (a) Symmetric (b) asymmetric (c) chiral (d) both b & c
- (7) Condition $n\lambda = 2d\sin\theta$ is known as _____ law for X-ray diffraction
 (a) Bragg's (b) Miller's (c) Laue's (d) Roentgen
- (8) In crystals like NaCl, KCl etc. the basis is.....
 (a) triatomic (b) diatomic (c) monoatomic (d) can't predict

Q.2. Answer the following in short. (Attempt Any Seven)

2x7= 14

- (1) What are the different criteria to classify sensors?
- (2) Write the basic principal of pH electrode.
- (3) Write about the first generation of Biosensor.
- (4) Give comparison between enzymes & microorganisms as bioreceptor.
- (5) Write the applications of biosensor.
- (6) Write the steps for protein crystallization.
- (7) Define Space lattice and Unit Cell.
- (8) List the properties of X-rays.
- (9) Briefly explain Laue method for X-ray diffraction.

Q.3

- (A) Describe the mechanical and thermal characteristics of sensors. **[06]**
- (B) Give an account on Static characteristics (i) Accuracy specified by inaccuracy **[06]**
 (ii) Non linearity (iii) Hysteresis of biosensor.

OR

- (B) Classify sensor electrodes. Discuss the principal and working of Ion Selective **[06]**
 Electrode with suitable diagram.

- Q.4 (A) Enlist the types of Biosensor. Explain glucose biosensor in detail. [06]
(B) In detail discuss the various bioreceptors used in construction of Biosensor. [06]

OR

- (B) Define Immobilization. Explain any three techniques for immobilization of enzymes in detail. [06]
- Q.5 (A) Describe any three protein crystal growth techniques. [06]
(B) List the physical properties of organic compounds. Explain isomerism in detail. [06]

OR

- (B) Give an account on the factors affecting the crystallization of protein. [06]
- Q.6 (A) Explain with suitable diagram modern Coolidge tube method for production of X-rays. [06]
(B) Define X-ray diffraction. Explain X-ray crystallography for Protein crystals. [06]

OR

- (B) Describe rotating crystal method to determine the crystal structure. List its advantages and disadvantages. [06]
