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[A-1213]

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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 is .....sensor.
(a) thermo-electric (b) electro-thermal
(c) thermo- magnetic (d) thermo-mechanical

(3) Urease biosensor is .....biosensors.
(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 of .....carbon.
(a) Symmetric (b) asymmetric (c) chiral (d) both b & c

(7) Condition $n\lambda = 2dsin\theta$ 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 (ii) Non linearity (iii) Hysteresis of biosensor. **[06]**

OR

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

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]

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