SEAT No._____ No. of Printed Pages : 2

[69/A-41]

SARDAR PATEL UNIVERSITY

M.Sc. (Integrated) Biotechnology-Semester VI Examination
Tuesday, 17th April, 2018
2:00pm to 5:00pm
PS06CIGB04: BIOSENSORS AND BIOCRYSTALLOGRAPHY

Total marks: 70

Q.1 Multiple choice questions **[08]**

i) .....is the ratio of the smallest incremental change in input, produces a detectable change in output of a sensor.
(a) Sensitivity (b) Resolution (c) Precision (d) Accuracy

ii) Piezoelectric sensors are .....sensor.
(a) Thermo-electric (b) Electro-thermal
(c) Thermo- magnetic (d) Electro-mechanical

iii) Which of the following technology is used for microarray manufacturing?
(a) Photolithography (b) Contact printing
(c) Ink jetting (d) All of these

iv) Which of the following can be used as bio receptors in Biosensor?
(a) Enzymes (b) Organelles (c) Immunoreceptor (d) All of these

v) The compound possessing identical molecular formula but different structures are referred as_____
(a) Epimer (b) Isomer (c) Enantiomer (d) None of these

vi) When the concentration of a protein is brought above its solubility limit, the solution becomes _____.
(a) Saturated (b) Unsaturated (c) Supersaturated (d) Watery

vii) Which of the following wavelength falls in X-rays region?
(a) 10^{-4} Å (b) 10 Å (c) 1000 Å (d) 10000 Å

viii) The relation of length of axes of unit cell in monoclinic crystal system is.....
(a) a=b=c (b) a=b≠c (c) a≠b≠c (d) a≠b=c

Q.2 Short Answer Questions. (Attempt any Seven) **[14]**

i) Give the classification of emerging sensor technologies.
ii) Write the basic principle of potentiometric sensor.
iii) Define Biosensor.
iv) Give the applications of Biochip.
v) Mention about the structure of atom.
vi) Write about Urea biosensor
vii) Give the properties of X-rays
viii) State Braggs'law.
ix) List the advantages of rotation crystal method of X-ray diffraction.

P.T.O

Q.3 a) Discuss the electrical characteristics of sensors. [06]

b) Describe Non linearity, Specificity & selectivity and sensitivity of biosensor. [06]

OR

b) Write a note on mechanical & thermal characterization of sensor. [06]

Q.4 a) What is immobilization? Explain in detail any three methods of immobilization. [06]

b) Write in detail about three generations of glucose biosensor. [06]

OR

b) Write short note on choice of transducer during construction of biosensor. [06]

Q.5 a) Describe hanging drop and microbatch method for crystal growth of macromolecule. [06]

b) Write a note on the factors affecting the process of protein crystallization. [06]

OR

b) Discuss in detail the physical properties of organic compounds. [06]

Q 6 a) Describe powder diffraction method for determination of crystal structure. [06]

b) Explain the steps of protein X-ray crystallography. [06]

OR

b) Explain the production of X-rays using Coolidge tube. List its advantages and disadvantages. [06]

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