

Seat No.: _____

No. of Printed Pages: 02

[A-5]

SARDAR PATEL UNIVERSITY
M. Sc. Integrated Biotechnology (IGBT) 6th Semester
Monday, 24th October, 2016
10:00 am to 5:00 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) Pressure and torque aremeasurands.
(a) thermal (b) electrical (c) mechanical (d) chemical
- (2) MEMS based sensors are
(a) image sensor (b) motion detector (c) accelometers (d) temperature sensor
- (3) Urease biosensor is first discovered by.....
(a) Clark (b) Guilbault (c) Lyon (d) None of these
- (4) is/ are example of amperometric biosensor
(a) Glucose (b) Urease (c) Both a & b (d) None of these
- (5) For the study of a protein in detail, an effort is usually made to first.....
(a) conjugate a protein to a known molecule
(b) determine its amino acid composition
(c) determine its molecular weight
(d) purify the protein
- (6) The 3D structure of protein crystal can be determined by.....
(a) XRD (b) NMR (c) Both a & b (d) spectroscopy
- (7) In NaCl crystal the basis is.....
(a) triatomic (b) diatomic (c) monoatomic (d) can't predict
- (8) The wavelength range of X-rays is.....
(a) 0.01 to 10 m (b) 0.01 to 100nm (c) 0.01 to 10 nm (d) 10 to 100 nm

Q.2. Attempt any Seven of the following:

2x7= 14

- (1) Give the classification of biosensors.
- (2) State the principal of potentiometric sensor.
- (3) What is first generation biosensor?
- (4) Enlist the methods of bioreceptor immobilisation.
- (5) Write the applications of biochip.
- (6) Explain Choline biosensor.
- (7) Define Unit cell and Single crystal.
- (8) Enlist the applications of X-rays.
- (9) Give the comparison of rotating and Weissenberg's x-rays diffraction methods.

- Q.3** (A) Explain the electrical characterization methods of sensors. [06]
(B) Discuss the operating principal and working of Ion Selective Electrode with suitable diagram. [06]

OR

- (B) Describe any three static characteristics of biosensor. [06]

(1)

- Q.4** (A) Explain Urea biosensor in detail and list its applications. [06]
(B) Write a note on second generation biosensors with examples. [06]

OR

- (B) What is bioreceptor? Discuss various bioreceptors used in construction of Biosensor. [06]
- Q.5** (A) What is crystallisation? Explain any two techniques of protein crystal growth. [06]
(B) Discuss the general properties of organic compounds. [06]

OR

- (B) Describe parameters affecting the protein crystallization. [06]
- Q.6** (A) Give the statement of Bragg's law. Explain Powder diffraction method to determine the crystal structure. [06]
(B) Write a note on modern Coolidge tube for production of X-rays. [06]

OR

- (B) Explain X-ray crystallography for Protein structure determination. [06]
