Enrollment No. _____

Shree Manibhai Virani and Smt. Navalben Virani Science College (Autonomous), Rajkot

Affiliated to Saurashtra University, Rajkot

SEMESTER END EXAMINATION NOVEMBER - 2017

M. Sc. Biotechnology

16PBTCC11 – ANALYTICAL TECHNIQUES

Duration of Exam – 3 hrs ***Semester – III*** ***Max. Marks – 70***

Part A (5x2= 10 marks)

Answer **ALL** questions

1. Describe the genetic and somatic effects of radiations
2. What is hypsochromic and bathochromic shift?
3. Define photopolymerization.
4. Differentiate between normal phase and reverse phase chromatography
5. What is transducer?

Part B (5x5= 25 marks)

Answer **ALL** questions

6a. Describe the principle and working of Fluorescence microscopy.

OR

6b. Write short note on
i) Radiation dosimetry ii) Applications of isotopes in biological study

7a. Write a short note on ESR.

OR

7b. Describe the different modes of vibrations in IR spectroscopy.

8a. Write a short note on isopycnic centrifugation.

OR

8b. Write principle of electrophoresis. Discuss in detail about 2-D gel electrophoresis.

9a. Explain the asymmetric peak and explain van Deemter equation.

OR

9b. Write a short note on Thermal conductivity and flame ionization detectors of GLC.

10a. Describe the types of biosensors with suitable examples for each.

OR

10b. Write applications of Biophysics in nuclear medicine.

Part C (5X7= 35 marks)

Answer **ALL** questions

11a. Draw a labeled diagram and explain the working principle, detection methods and applications of atomic force microscopy (AFM). What is the major difference between AFM and STM?

OR

11b. Defining radioactivity, explain the method for detection and measurement of radioactivity.

12a. Explain in brief with respect to NMR
i) Chemical Shift
ii) Spin-Spin Coupling

OR

12b. What is mass spectroscopy? Discuss the construction and working of MALDI-TOF.

13a. Describe the process of polymerization in PAGE and state various application of PAGE.

OR

13b. Explain the principle of centrifugation and give the derivation of sedimentation of non-spherical particle.

14a. Elaborate the principle and procedure to purify proteins by TLC techniques.

OR

14b. Describe the following :
i) Retention time.
ii) Stationary phase and Supporting phase.
iii) Ion exchange chromatography.

15a. Write a note on Mammography.

OR

15b. Explain the principle, technique and applications of flow cytometry in detail.