NAN-003-001622 Seat No. _____

B. Sc. (Sem. VI) (Biotech.) (CBCS) Examination

March / April - 2017

BT-602 : Analytical Techniques in Biotechnology

Faculty Code : 003
Subject Code : 001622

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

SECTION - I

1 Answer the following : **20**

(1) The structure and function of the total protein component of the cell is called _____.

(2) Atomic and molecular masses are expressed as _____.

(3) Analytical specificity is also called _____.

(4) A Geiger counter is able to provide an indirect measure of radioactivity because radiation has a property of _____.

(5) The most penetrating of the three common types of nuclear radiation is the _____.

(6) The wavelength of an absorption is 495 nm. In what part of the electromagnetic spectrum does this lie ?

(7) In gel filtration chromatography separates molecules according to their _____.

(8) Which would be best to separate a protein that binds strongly to its substrate ?

(9) Atomic engineering is also called _____.

(10) A patent lasts for _____ years.

(11) In gas chromatography, the basis for separation of the components of the volatile material is the difference in _____.

(12) An atom or molecule with an unpaired electron in the outer shell is called _____.

(13) The distance travelled by light as it passes through a cuvette is called _____.

(14) Infrared spectroscopy provides valuable information about _____.

(15) _____ an optical device that has many rows of equally spaced grooves that also produce interference patterns.

(16) _____ is the tracking dye use in the PAGE is.

(17) What is the first stage of the 2D gel electrophoresis ?

(18) In reverse phase chromatography, the stationary phase is made _____.

(19) The photomultiplier tube is a widely used _____ in UV-Vis spectroscopy.

(20) _____ technique is used to determine the molecular mass of an organic molecule.

SECTION - II

2 (a) Write any three out of six : **6**

(1) Define radioactivity.

(2) State Beer lambert law.

(3) Define Protein purification.

(4) What is importance of sensitivity in analytical technique ?

(5) Write two applications of 2D gel electrophoresis.

(6) What is n/p ratio ? Discuss its importance.

(b) Write any three out of six : **9**

(1) Discuss in short about basic components of centrifuge.

(2) Principle and application of Scintillation counter.

(3) Principle and applications of Agarose electrophoresis.

(4) Write properties of support media used in gel filtration chromatography.

(5) Name and state different buffers used in SDS PAGE.

(6) Derive equation to establish relationship between RCF and RPM.

(c) Write any two out of five : **10**

(1) What is radioactive decay ? Discuss in short about types of radioactive decay.

(2) What is capillary electrophoresis ? Discuss advantages and applications of capillary electrophoresis.

(3) Enlist applications of radioactivity in biological science.

(4) What is sedimentation ? Derive equation to show basics of sedimentation rate and velocity.

(5) What are difference between density gradient centrifugation and differential centrifugation ?

SECTION - III

3 (a) Write any three out of six : **6**

(1) Name two types of elution process used in Chromatography.

(2) Write basic difference between atomic absorption and atomic emission spectroscopy.

(3) Basic flow diagram of Biosensor.

(4) Principle and examples of Potentiometer.

(5) Applications of planner chromatography.

(6) Define fluorescence and its importance.

(b) Write any three out of six : **9**

(1) What is rate theory of chromatography ?

(2) What is chemical shift ? Write applications of NMR in biotechnology.

(3) State applications of electromagnetic spectrum in biotechnology.

(4) Applications of affinity chromatography.

(5) Principle and applications of nanotechnology.

(6) Write a note on Detectors used in GLC.

(c) Write any two out of five : **10**

(1) Discuss in detail about principle and applications of HPLC ?

(2) What is mass spectrophotometer (MS) ? Write in short about components and applications of MS in Biotechnology ?

(3) What are ideal characteristics and applications of Biosensor ?

(4) Derive Bragg equation. Discuss its importance in X-ray crystallography.

(5) What is IPR ? State procedure and importance of IPR.
