DA-003-001622 Seat No. _____

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

April / May – 2015

BT-602 : Analytical Techniques in Biotechnology

Faculty Code : 003
Subject Code : 001622

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

Instructions : (i) Figures in the right indicate marks.

(ii) All questions are compulsory.

(iii) Draw a diagram wherever necessary.

(iv) Write answers of all questions in main answer sheet.

SECTION - I

1 Multiple choice questions : **20**

(1) What ratio of the sample dictates its electrophoretic mobility ?

(A) charge/mass (B) mass/charge

(C) Net charge (D) All

(2) A Geiger counter indirectly measures radiation by measuring

(A) Ions produced (B) Flashes of light

(C) Speaker static (D) Curies

(3) One disintegration per second (1 d.p.s.) is

(A) Ci (B) Bq

(C) Gy (D) rad

(4) Who popularised the concept of TLC ?

(A) A. J. P Martin (B) Stahl

(C) Tswett (D) Abramson

(5) Agar consists of two galactose based polymers

(A) agarose and agaropectin

(B) amylose and agaropectin

(C) Agarose and amylose

(D) none of the above

(6) Which of the following is the SI unit ?

(A) Candela (B) Tesla

(C) Pascal (D) Curie

(7) In paper chromatography, stationary phase is

(A) Paper (B) Water

(C) Acetone (D) None

(8) What will be the regain value of G-100 sephadex gel ?

(A) 1.0 (B) 10.0

(C) 100 (D) 0.1

(9) What will be the T-value if the substance is totally transparent ?

(A) 100% (B) 0%

(C) 0% (D) (A) and (B)

(10) The basis of separation of ions in the mass spectrophotometer is

(A) mass/charge ratio

(B) charge/mass ratio

(C) (A) and (B)

(D) ionisation

(11) A form of column packing material in which a porous particles are coated on to an inert solid core such as a glass bead is _____.

(A) Microporous support / phase

(B) Pellicular supports / phase

(C) Banded phase

(D) Macroporous supports / phase

(12) Which type of detector is used to measure organic compound in GC ?

(A) Electron capture detector

(B) Thermionic emission detector

(C) Flame ionization detector

(D) Mass spectrometry

(13) The governing factor in ion-exchange reaction is

(A) London force (B) Dispersion force

(C) (A) and (B) (D) Electrostatic force

(14) In retardation factor R_G. G stands for ?

(A) Carbohydrate (B) Glucose

(C) (A) and (B) (D) Glycogen

(15) Buckyball is _____.

(A) Carbon molecule (B) C-60

(C) nanoball (D) (A) and (B)

(16) Which of the following is not Intellectual property ?

(A) words (B) music

(C) symbols (D) none

(17) By using Microbial cells and oxygen electodre one can measure.

(A) Glucose (B) Nitrate

(C) Sulphur (D) Carbon dioxide

(18) One nanometer (nm) is equal to

(A) 10^{-12} m (B) 10^{-9} m

(C) 10^{-6} m (D) 10^{-6} mm

(19) Patent is granted to those who invents

(A) Process (B) Ideas

(C) Non-obvious process (D) Obvious process

(20) _____ is a scientific instrument used for measuring electric charge.

(A) Voltameter (B) Coulometer

(C) Amperometer (D) (A) and (B)

SECTION - II

2 (a) Answer in short : (any 3 from 6) **6**

(1) What is Radioactivity ?

(2) Define agarose gels and how can you vary the pore size of it ?

(3) Give Beer's law.

(4) What is radiation ?

(5) What is biochemistry ?

(6) Explain Isotachophoresis.

(b) Answer specifically : (any 3 from 6) **9**

(1) Explain Geiger Muller region.

(2) Describe the applications of radioactivity.

(3) Describe the basic principle of centrifugation.

(4) Explain the phenomenon of quenching.

(5) Describe the factors affecting μ.

(6) Explain the general theory of the interaction of electromagnetic radiation with matter.

(c) Write short notes on : (any 2 from 5) **10**

(1) Explain radioactive decaying.

(2) Describe Emission spectroscopy.

(3) The principle and application of UV-visible spectroscopy.

(4) Explain Density gradient centrifugation.

(5) Explain IEF Electrophoresis in brief.

3 (a) Answer in short : (any 3 from 6) **6**

(1) Define biosensors with examples.

(2) What is standard international unit of radioactivity ?

(3) Explain Partition principle.

(4) Which type of spectroscopy is used to find out atomic concentration and give its applications.

(5) Define nanotechnology. Name the versions of scanning probes that launched nanotechnology.

(6) What is R_f ?

(b) Answer specifically : (any 3 from 6) **9**

(1) Define : patenting, copyright and trade secret.

(2) Explain the types of biosensors.

(3) Write down the biological application of mass spectroscopy.

(4) What is the fundamental concept involved in nanotechnology ?

(5) Explain any one type of plane chromatography.

(6) Explain the Nature of partition forces in chromatography.

(c) Write short notes on : (any 2 from 5) **10**

(1) Explain briefly Molecular sieve chromatography.

(2) Explain SDS-page electrophoresis.

(3) Explain the principle of biosensor and write down its applications.

(4) What is nanotechnology ? Explain tools and techniques involved in it. Give its applications.

(5) Explain Electroanalytical Techniques.
