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BBG-003-1016042 Seat No. _____

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

July – 2021

BT-602 Analytical Technique in Biotechnology

(New Course)

Faculty Code : 003
Subject Code : 1016042

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

1 (a) Answer the questions : (one mark each) **4**

(1) n/p ratio for stable nucleus is _____.

(2) _____ solution is one in which no standard analyte is present used in analysis.

(3) _____ ability of technique to determine lowest possible concentration in the given sample.

(4) The study of total protein in the cell is called _____.

(b) Answer the question : **2**

Write units of Radioactivity.

(c) Answer the question : **3**

Write parameters for selection of any analytical method in biotechnology.

(d) Answer the question : **5**

How to measure of radioactivity ?

2 (a) Answer the questions : (one mark each) **4**

(1) Avogadro constant is equivalent to _____.

(2) The study of small molecule in the cell is called _____.

(3) An atom of an isotope with a large neutron-to-proton ratio will probably emit a (an) _____

(4) A radioactive decay rate of 1 curie represents _____ dps.

(b) Answer the question : **2**

Name common radioisotopes used in molecular biology.

(c) Answer the question : 3

Discuss in detail about applications of radioactivity.

(d) Answer the question : 5

What is radioactive decay ? Write in detail about types of radioactive decay.

3 (a) Answer the questions : (one mark each) 4

(1) Full form of PAGE.

(2) Name chemical used to provide density to molecule during electrophoresis.

(3) Name the technique used in 2D gel electrophoresis.

(4) Name scientist who discovered electrophoresis.

(b) Answer the question : 2

Write principle of SDS PAGE.

(c) Answer the question : 3

Write principle and applications of AGE.

(d) Answer the question : 5

Write in detail about principle and applications capillary electrophoresis.

4 (a) Answer the questions : (one mark each) 4

(1) Full form of AGE.

(2) Name chemicals which can be used to provide density in density gradient centrifugation.

(3) What is contribution of Theodor Svedberg.

(4) Name staining method which can be used in SDS PAGE.

(b) Answer the question : 2

Write principle of 2D gel.

(c) Answer the question : 3

What is differential centrifugation ? How is different from density gradient centrifugation ?

(d) Answer the question : 5

What is centrifugation ? What is basic principle of sedimentation, explain with derivation of equation.

5 (a) Answer the questions : (one mark each) 4

(1) State Beer Lamber Law.

(2) What is range for UV light ?

(3) Name scientist who discovered X-ray.

(4) Full form of NMR.

(b) Answer the question : **2**

Write advantages of microtiter plate reader.

(c) Answer the question. **3**

What is atomic spectroscopy ? Write basic difference between AAS and AES.

(d) Answer the question : **5**

What is IR ? Discuss in detail about fundamentals and applications of IR spectroscopy.

6 (a) Answer the questions : (one mark each) **4**

(1) _____ technique used to determine functional group.

(2) What is range for visible light ?

(3) _____ is a wavelength at which compound absorbs maximum light.

(4) _____ is called the fourth state of matter.

(b) Answer the question : **2**

Write principle and applications of NMR.

(c) Answer the question : **3**

State Beer's Lambert Law and derive equation and write limitations of law.

(d) Answer the question : **5**

Discuss in detail about instrumentation of UV Visible spectrophotometer.

7 (a) Answer the questions : (one mark each) **4**

(1) Ion exchange chromatography is based on the _____.

(2) Full form UPLC.

(3) Write formula of Kd.

(4) In normal phase chromatography, the stationary phase is made _____.

(b) Answer the question : **2**

Write advantage of UPLC over HPLC.

(c) Answer the question : **3**

What is role of pump in HPLC ? Write characteristics and types of pump used in the HPLC.

(d) Answer the question : **5**

What is GLC ? Discuss in detail about instrumentation and applications of GLC.

8 (a) Answer the questions : (one mark each) **4**

(1) Rf =

(2) In reverse chromatography, mobile phase is _____.

(3) Define capacity factor in chromatography.

(4) GLC the basis for separation of volatile material is the difference in _____.

(b) Answer the question : **2**

Write advantages of TLC over paper chromatography.

(c) Answer the question : **3**

Write a note on ion exchange chromatography.

(d) Answer the question : **5**

What is principle of chromatography ? Discuss in detail about affinity chromatography.

9 (a) Answer the questions : (one mark each) **4**

(1) Father of Nanotechnology.

(2) Full form of MALDI.

(3) Name few examples of widely used biosensors.

(4) Define trademark.

(b) Answer the question : **2**

What is benefits of patent ?

(c) Answer the question : **3**

Write about principle of microscopy technique used in nanotechnology.

(d) Answer the question : **5**

What is Mass spectrophotometer ? Discuss in detail about different sources for ionization of molecule and applications of MS.

10 (a) Answer the questions : (one mark each) **4**

(1) Nanotechnolgoy, in other words, is

(2) Full form of IPR.

(3) Define copy right.

(4) Name widely used microscopy used in nanotechnology.

(b) Answer the question : **2**

Write application of Biosensor.

(c) Answer the question : **3**

Write ideal characteristics of Biosensors.

(d) Answer the question : **5**

What is nanotechnology ? Discuss in detail about fundamentals and applications of Nanotechnology.
