



BBG-003-001326 Seat No. _____

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

July - 2021

BC-301 : Biophysical & Biochemical Techniques

Faculty Code : 003

Subject Code : 001326

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

Instructions :

- (1) Question 1 is compulsory and one mark of each question.
- (2) Figures in the right indicate marks.

SECTION - I

1 Answer the following questions : (each have 1 mark) **20**

- (1) In the equation $A = \epsilon Cl$ what quality is represented by " ϵ " ?
- (2) The wavelength of visible range is _____ nm.
- (3) Name the materials used in density gradient centrifugation.
- (4) Give the full name of PMT.
- (5) Fine insoluble solids particles from a liquid suspension can be removed through _____ techniques.
- (6) What is the maximum speed of table-top centrifuge ?
- (7) The sedimentation rate of particles depends on density and radius. True/false.
- (8) Write full name of RCF.
- (9) Define ionizing radiation.
- (10) Describe tracers.

- (11) Give the state on Nuclei with atomic number 1 to 82 are stable or unstable.
- (12) Which radioisotopes is use for treatment of cancer and tumor cell ?
- (13) In case of reveres phase chromatography, what is the nature of a stationary phase; polar or non polar ?
- (14) Electrostatic attraction is that basis for separation in which type of chromatography ?
- (15) Write the names of absorbents used in TLC.
- (16) Which chromatography possess stationary phase-liquid and mobile-phase in gaseous state ?
- (17) What is the role SDS in SDS-PAGE electrophoresis ?
- (18) In the gel electrophoresis, name the most commonly used gel for separation of DNA.
- (19) In electrophoresis, DNA will migrate towards which electrode ?
- (20) Which biomolecules cannot separated by electrophoresis techniques ?

SECTION - II

- 2** (a) Answer in brief : (any 3 out of 6) **3×2=6**
- (1) State the Beer's and Lambert's laws of light absorption.
 - (2) Define extinction coefficients.
 - (3) List various hydrodynamic techniques.
 - (4) What are radioisotopes ?
 - (5) Define : Chromatography and give its importance.
 - (6) What is isoelectric focusing ?

(b) Answer in detail : (any 3 out of 6) **3×3=9**

- (1) Discuss principle of paper chromatography.
- (2) Explain in brief scintillation counting.
- (3) What is the limitation of Beers and Lamberts law ?
- (4) Define electrophoresis and give its principle.
- (5) Write applications Small batch table top centrifuge.
- (6) Write about units of radioactivity.

(c) Write notes on : (any 2 out of 5) **5×2=10**

- (1) Describe using diagram, the instrumentation of single beam spectrophotometer.
- (2) Write a note on Geiger-Muller counter.
- (3) Explain in detail density gradient centrifugation techniques.
- (4) Write a general principle and methodology of affinity chromatography.
- (5) Write down gel electrophoresis and its applications.

3 (a) Answer in brief : (any 3 out of 6) **3×2=6**

- (1) Give any two application of colorimeter.
- (2) What is the role of monochromators into spectrophotometer ?
- (3) What is micro electrophoresis ?
- (4) Function of polyacrylamide gel electrophoresis (PAGE).
- (5) Write any three uses of radio isotopes.
- (6) Give the basic concept of centrifugal force and relative centrifugal force.

(b) Answer in detail : (any 3 out of 6) **3×3=9**

- (1) Describe ion exchange chromatography.
- (2) Explain paper electrophoresis.
- (3) Draw the well labelled diagram of photo emissive tube.
- (4) Write down advantages of double beam spectrophotometer.
- (5) Write the effect of α -particles emission from radio isotopes on atomic number and mass number.
- (6) Explain principle, methods, procedure of thin layer chromatography.

(c) Write notes on : (any 2 out of 5) **5×2=10**

- (1) Write a note on autoradiography.
 - (2) Write in detail applications of spectrophotometers in biochemistry.
 - (3) Write a detail note on differential centrifugation and its application.
 - (4) Discuss on HPLC-high performance liquids chromatography.
 - (5) Write about 2-D PAGE electrophoresis.
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