REV-00
BBT/71/76

2017/06

B. Sc. Biotechnology

SECOND SEMESTER

BIOINSTRUMENTATION

BBT- 201

Duration: 3 Hrs. **Marks: 70**

{ PART : A (OBJECTIVE) = 20
PART : B (DESCRIPTIVE) = 50 }

Duration: 2 Hrs. 40 Mins. **Marks: 50**

[PART-B : Descriptive]

[Answer question no. One (1) & any four (4) from the rest]

1. What is sedimentation? Describe its theory and application in separation of particles of an aqueous mixture in the laboratory experiments. 3+7=10

2. Define half-life of an isotope. Explain the different types of radioactive decay emitting α, β and γ radiations. 3+7=10

3. What do you mean by autoradiography? Explain the resolving power of autoradiograph and auto radiographic emulsion used in preparation of radiogram. 2+8=10

4. What is ion exchange chromatography? Explain anion exchange chromatography for protein separation with diagram. 3+7=10

5. *Write short notes on:* 5+5=10
   a. Beer-Lambert's law and its applications
   b. Determination and applications of extinction coefficient.

6. What is the basic principle of Agarose gel electrophoresis? Explain how DNA can be separated using Agarose gel electrophoresis. 3+7=10

7. What are the different types ELISA techniques? Describe Sandwich ELISA technique for the detection of pathogens. 4+6=10

8. Define antigen-antibody interaction and cross reactivity. Write a note on Radio Immune Assay (RIA). 4+6=10

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BIOINSTRUMENTATION

BBT- 201

DURATION: 20 Mnts. **MARKS: 20**

[PART-A : Objective]

Choose the correct answer from the following: *1×20=20*

1. Radioactive particles emit radiation particles in the process of decay.
- a. True
- b. False

2. Tendency of particles to settle from the fluid in which they are merged is referred as sedimentation.
- a. True
- b. False

3. Radiations emitted by the radioactive material can not penetrate the human body.
- a. True
- b. False

4. Liquid scintillation counter is used to measure the activity of alpha radiation.
- a. True
- b. False

5. In centrifugation the centrifugal force acts in quick separation of the particles.
- a. True
- b. False

6. F. Muller invented the fact of emitting radiations by the radioactive materials.
- a. True
- b. False

7. In electrophoresis, DNA Will migrate towards
- a. Cathode or positive electrode
- b. Anode or negative electrode
- c. Cathode or negative electrode
- d. Anode or positive electrode

8. The most common type of gel used for DNA separation
- a. Agar
- b. Polyacrylamide
- c. Agarose
- d. All of the above

9. In SDS-PAGE, separation is based on
- a. Molecular weight
- b. Shape
- c. Charge
- d. All of the above

10. In an SDS-PAGE
- a. Proteins are denatured by the SDS
- b. Proteins have the same charge-to-mass ratio
- c. Smaller proteins migrate more rapidly through the gel
- d. All of the above

11. In is electric focusing, proteins are separated on the basis of their
- a. Relative content of positively charged residue only
- b. Relative content of negatively charged residue only
- c. Size
- d. Relative content of positively and negatively charged residue

12. In A gel filtration column
- a. Smaller proteins enter the beads more readily
- b. Large proteins elute first
- c. Both (a) and (b)
- d. Large proteins enter the beads more readily

13. Thin layer chromatography is
- a. Partition chromatography
- b. Electrical mobility of ionic species
- c. Adsorption chromatography
- d. None of the above

14. Proteins Can be visualized in gels by
- a. Staining them with the dye
- b. Using electron microscope only
- c. Measuring their molecular weight
- d. None of the above

15. In Which of the following separation method where proteins are separated on the basis of their net charge
- a. Affinity chromatography
- b. Ion exchange chromatography
- c. Dialysis
- d. Gel filtration chromatography

16. The use of insulin hormone to purify its receptor is an example of
- a. Ion exchange chromatography
- b. Affinity chromatography
- c. Gel filtration chromatography
- d. Ligand mediated chromatography

17. Place the following reactants in their proper order for the indirect ELISA test

1 = enzyme-linked antibody
2 = known antigen
3 = patient serum
4 = substrate

a. 2 4 1 3
b. 3 2 1 4
c. 1 4 3 2
d. 4 1 3 2

18. In a chromatographic separation, which of the following indices is most appropriate for the qualitative identification of a substance?

a. Relative retention factor R_{rel}
b. Retention factor R_f
c. Retention time
d. Resolution

19. Which of the following wavelength ranges is associated with UV spectroscopy?

a. 0.8 – 500 µm
b. 400 – 100 nm
c. 380 -750 nm
d. 0.01 – 10 nm

20. According to the Beer-Lambert Law, on which of the following does absorbance not depend

a. Colour of the solution
b. Distance that the light has travelled through the sample
c. Solution concentration
d. Extinction coefficient of the sample

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UNIVERSITY OF SCIENCE & TECHNOLOGY, MEGHALAYA

Question Paper CUM Answer Sheet

[PART (A) : OBJECTIVE]

Serial no. of the main Answer sheet

Course : .....

Semester : ..... **Roll No :** .....

Enrollment No : ..... **Course code :** .....

Course Title : .....

Session : 2016-17 **Date :** .....

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Instructions / Guidelines

- The paper contains twenty (20) / ten (10) questions.
- The student shall write the answer in the box where it is provided.
- The student shall not overwrite / erase any answer and no mark shall be given for such act.
- Hand over the question paper cum answer sheet (Objective) within the allotted time (20 minutes / 10 minutes) to the invigilator.

Full Marks	Marks Obtained	Remarks
20		

Scrutinizer's Signature *Examiner's Signature* *Invigilator's Signature*