Code No:6977

Reg. No.....
Sub. Code: PMBE16

M.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2021
FIRST SEMESTER
MICROBIOLOGY - ELECTIVE
BIOCHEMICAL TECHNIQUES AND INSTRUMENTATION
(for those who joined in July 2017 onwards)

Time : Three hours

Maximum: 75 marks

Part – A (10 X 1 = 10 marks)
Answer all question, choose the correct answer:

1. In UV- VIS spectrophotometry, a wavelength shift is bathochromic and hyper chromic, when -------

(a). the absorption maximum is shifted to a higher wavelength and its intensity does not change

(b). the absorption maximum is shifted to a higher wavelength and its intensity decreases

(c). the absorption maximum is shifted to a lower wavelength and its intensity increases

(d). the absorption maximum is shifted to a higher wavelength and its intensity increases

2. The following are ionizing radiations except -----

(a).ultraviolet radiations

(b).alpha radiations

(c). beta radiations

(d). gamma radiations

3. The common way of expressing rotor speed is in terms of ------

(a). revolutions per minute

(b). revolutions per second

(c). revolution per hour

(d). none of these

4. The analytical centrifuge is used for the following

(a). to determine relative molecular mass of macromolecules such as proteins and DNA

(b). to investigate the purity of DNA preparations, viruses and proteins

(c). to detect conformational changes in macromolecules such as DNA and proteins

(d). all of these

5. Adsorption chromatography was first developed by the American petroleum chemist ------ in 1900.

(a). Michael Tswett

(b). Martin Consden

(c). D.T.Day

(d).Alexander Reuss

6. ------- detectors used in HPLC except.

(a). Ultraviolet absorbance photometric detector

(b). Fluorometric detector

(c). Refractive index detector

(d). Flame ionization

7. Sodium Dodecyl Sulphate(SDS) is used while separating proteins by SDS- PAGE because ---

(a). it helps in solubilisation of proteins thereby making it easier to separate

(b). it binds proteins and confers uniform negative charge density thereby making them move during electrophoresis

(c). decreases the surface tension of the buffer used for electrophoresis

(d). stabilizes the proteins

(8). Electrophoretic separation of RNA molecules based on their molecular weights, requires a denaturant such as formaldehyde to be present in the gel system, because-----

(a).RNAs are sensitive to nucleases

(b). RNAs are single stranded and can form different secondary structures by base pairing

(c). RNAs are usually present in high amounts

(d). RNAs are usually small

(9). From the bands in the autoradiography, it is evident that more and more proteins were synthesized over the 5 hours after the protein synthesis inhibitor was added. Which of the following explains this phenomenon?

(a). the bands are non- specific

(b). the bands are accumulations of the proteins before the drug was added

(c). the protein inhibitor does not block expression of the nuclear genes

(d). the cells are not dividing

10. A Raman spectrum provides information about the following facts except ----

(a). presence or absence of specific linkages in a molecule

(b). separation of plasma cortisol

(c). study of isomers

(d). presence of impurities in dyes

PART B -- (5x5 =25 marks)

Answer ALL questions, choosing either (a) or (b)

Each answer should not exceed 250 words

11. (a). Explain Acid – Base titration curve and pKa values.

OR

(b). Explain the principle and applications of ultra violet spectroscopy.

12. (a) Discuss about sedimentation rate.

OR

(b). Describe differential centrifugation and its applications.

13. (a). Write short notes on Affinity chromatography.

OR

(b). Explain the principle and applications of thin layer chromatography?

14. (a). Write a descriptive notes on Autoradiography.

OR

(b). Write short notes on Southern blot.

15. (a). Write short notes on X- ray spectroscopy.

OR

(b). Explain biochemical applications of radioisotopes.

PART C --- (5x8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)

Each answer should not exceed 600 words

16. (a).Write short notes on the following;

i. Electromagnetic radiation

ii. Absorption spectrum

OR

(b). Explain the principle and applications of Turbidimetry.

17. (a). Explain the principle, methodology and applications of density gradient centrifugation.

OR

(b). Describe different types of roters used in centrifugation.

18. (a). Explain the principle, mechanism and applications of ion exchange chromatography.

OR

(b). Describe gel permeation chromatography and its applications

19. (a). Write a detailed notes on Agarose gel electrophoresis.

OR

(b). Discuss about isoelectric focusing.

20. (a). Explain the principle and applications of Atomic absorption spectroscopy?

OR

(b). Discuss about safety aspects of radio isotopic technique?
