

P-303[BIOINSTRUMENTATION]

1. Answer the following questions.

[1 mark]

1. The theory of Nuclear Magnetic Resonance (NMR) was elucidated by

- a) Felix Bloch
- b) Goldman
- c) Richard wolf
- d) Edward Purcell

2. Hertz is a unit of

- a) Loudness
- b) Intensity
- c) Frequency
- d) Power

3. UV rays cause

- a) Deletion of Pyrimidines
- b) dimerisation of pyrimidines
- c) Substitution of purine for pyrimidine
- d) Cross linking of purine with pyrimidine

4. NMR spectroscopy is

- a) Diffraction
- b) Absorption
- c) Radiation
- d) Emission

5. NMR is based on

- a) Nuclear fission
- b) Charge of nucleus
- c) Magnetically moment of the nucleus
- d) Electrical moment of the nucleus

6. The best conductor of electricity

- a) Graphite
- b) Coal
- c) Coke
- d) Diamond

7. Weakest force is

- a) Vander walls
- b) Covalent bond
- c) Ionic bond
- d) Hydrogen bonding

8. All are associated with green house effect except

- a) Carbon dioxide
- b) Methane

- c) Ozone
- d) N₂

9. Covalent bonding is between two molecules requires

- a) Electron with opposite spins
- b) No effect of spins
- c) Electron with same spins
- d) Electron of the same orbital

10. Strongest bond

- a) Vander walls
- b) Covalent bond
- c) Electostatic
- d) Hydrogen bonding

11. Radioactive substance emits the following rays except

- a) Gamma
- b) Beta
- c) Alpha
- d) X –rays

12. Instrument used for measurement of optical activity is

- a) Spectrophotometer
- b) Polarimeter
- c) Calorimeter
- d) Infantometer

Answers

1. a) Felix Bloch & d) Edward Purcell
2. c) Frequency
3. b) dimerisation of pyrimidines
4. b) Absorption
5. c) Magnetically moment of the nucleus
6. a) graphite
7. a) Vander walls
8. d) N₂
9. a) Electron with opposite spins
10. b) Covalent bond
11. d) X -rays
12. b) Polarimeter

2. Answer the following questions within 2-3 sentences.

[1.5 mark]

1. What is fluorescence ?
2. What is scanning microscope ?
3. What is an electron microscope ?
4. Mention image processing method in microscopy.
5. State principle of spectrophotometer.
6. State NMR and its principle.

7. Mention function of NMR Spectroscopy.
8. State basic principle of mass spectroscopy.
9. State uses of mass spectrometer.
10. What is autoradiography ? State its principle.
11. State basic principle of sedimentation.
12. Mention applications of centrifugation.
13. State principle of chromatography.
14. What do you mean by Thin layer chromatography ?
15. What do you mean by adsorption chromatography ?
16. State principle of ELISA .
17. What is flow cytometry ?
18. State uses of FISH technique .
19. What is southern blotting ?
20. State Northern Blotting.

3. Answer the following questions within 75-100 words.

[2 marks]

1. State principle and operation of light microscope.
2. Mention different fixation and staining techniques of electron microscope.
3. Mention application of spectrophotometer.
4. Mention different types of NMR.
5. State advantages of NMR.
6. State stages of mass spectrometry .
7. Mention advantage of mass spectrometry.
8. Mention components of mass spectrometer.
9. State 5 process of mass spectrometry.
10. Mention applications of autoradiography.
11. What do you understand by diff. centrifugation & density gradient centrifugation ?
12. What is ultra-centrifugation ?
13. State HPLC and its principle ?
14. State industrial applications of chromatography .
15. State applications of ELISA.
16. What is immunohistochemistry ?
17. State principle of PCR .
18. State steps of Western Blotting.
19. Discuss native gels .
20. What is gradient gels.

4. Answer the following questions within 500 words.

[6marks]

1. Give the principle and operation of light microscope.
2. State about scanning and electron microscopy.
3. Give the different fixation and staining techniques for electron microscopes.
4. Write about the image processing method in microscopy.
5. Give the principle , instrumentation and application of spectrophotometer.
6. What is NMR spectroscopy?

7. What is mass spectroscopy?
8. Give a brief account on autoradiography .
9. Write a short note on centrifugation techniques.
10. Discuss the principles and types of chromatography.
11. What is principle and application of ELISA ?
12. Write a short note on flow cytometry.
13. Give an account on immunohistochemistry.
14. Write a short note on immunofluorescence and fluorescent insitu hybridisation.
15. What is general principle of electrophoresis of proteins ?
16. Give the principle and operation of PCR ?
17. Explain about electrophoresis of nucleic acids.
18. What are different blotting techniques ?