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Reg. No. : .....

Name : .....

**Second Semester B.Sc. Degree Examination, September 2022**

**Career Related First Degree Programme Under CBCSS**

**Botany & Biotechnology**

**BB 1221 : Biophysics and instrumentation**

**(2020 Admission Onwards)**

Time : 3 Hours

Max. Marks : 80

**SECTION – A**

Answer all the questions in a word or one or two sentences. Each question carries 1 mark.

1. State Beer Lambert's law.
2. What is magnification of a microscope?
3. Give two examples for radioisotopes.
4. Name a dye used in electrophoresis.
5. Comment on scintillation counter.
6. Define phosphorescence.
7. What is a stacking gel?
8. Name two mobile electron carriers in respiration.

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9. Define cuvette.
10. What is polarizability?

(10 × 1 = 10 Marks)

### SECTION – B

Answer any eight questions. Each question carries 2 marks. (Answer not to exceed one paragraph)

1. What is a pH meter? Explain its working.
2. List the applications of Atomic Force Microscopy.
3. What is resonance?
4. Write the principle of fluorescence microscopy.
5. What is SDS-PAGE? Explain its principle?
6. Define membrane potential.
7. What is isoelectric focussing?
8. Differentiate between endothermic and exothermic reactions.
9. What is cataract? What is its cause?
10. List the applications of X-ray crystallographic techniques.
11. What is the significance of R. Q.?
12. Comment on submarine electrophoresis.
13. What is centrifugation? Explain different types of centrifuges.
14. State the second law of thermodynamics.
15. What is proton motive force?
16. Mention the use of condenser lens in microscopy.

(8 × 2 = 16 Marks)



## SECTION – C

Answer any six questions. Each question carries 4 marks. (Answer not to exceed 120 words)

27. What is IR spectroscopy? Add a note on its applications.
28. Explain the structure of ATP synthase.
29. What are the components of polyacrylamide gels?
30. What are the applications of cobalt-60?
31. Discuss the bioenergetics of Krebs's cycle.
32. What is a hearing aid? How does it work?
33. Comment on confocal microscopy.
34. What is immunoelectrophoresis? List its applications.
35. Give a short note on colorimetry.
36. What is autoradiography? What is its principle?
37. Discuss the importance of mass spectrometry in proteomics.
38. Explain the working of Transmission Electron Microscope.

(6 × 4 = 24 Marks)

## SECTION – D

Answer any two questions. Each question carries 15 marks. (Answer not to exceed three pages)

39. Explain the principle, working and applications of NMR Spectrometer.
40. With suitable diagrams. explain the mechanism of vision.

41. Define electrophoresis. Explain principle and applications of agarose gel electrophoresis.
42. What is oxidative phosphorylation? Discuss ATP synthesis based on chemiosmotic hypothesis.
43. Explain the principle, working and applications of phase contrast microscopy.
44. What is flow cytometry? Explain its principle and applications.

(2 × 15 = 30 Marks)

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