

Reg. No. :

Name :

Third Semester B.Sc Degree Examination, October 2019

First Degree Programme under CBCSS

Complementary Course for Botany/Microbiology

CH 1331.3 – PHYSICAL AND INORGANIC CHEMISTRY

(2013-16 Admissions)

Time : 3 Hours

Max. Marks : 80

SECTION A

Answer all questions.

Answer in one word to maximum of two sentences . Each question carries 1 mark.

1. Write any two factors affecting the reaction rate.
2. Write the Arrhenius equation.
3. What is Raoult's law?
4. Write an expression for half-life period of first order reaction.
5. Radioactive decay usually follows _____ order reaction.
6. Give an example for azeotropic mixture.
7. Explain the term conjugate acid base pair.
8. What is meant by chemical shift in NMR spectroscopy?

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9. What do you mean by artificial transmutation? Give one example.
10. Name the internal standard used in NMR spectroscopy.

(10 × 1 = 10 Marks)

SECTION B

Short answer type (Not to exceed one paragraph)

Answer any eight questions from the following. Each question carries 2 marks.

11. Differentiate between order and Molecularity.
12. What is absorbent and adsorbate?
13. What are the effects of impurities on miscibility and CST?
14. A first order reaction is 20% complete in 10 minutes. Calculate the time taken for the reaction to go to 80% completion.
15. Write any two applications of chromatographic techniques.
16. Write the principle of colorimetric estimation.
17. Give the basic principle of chromatography.
18. What is Beer- Lambert's Law?
19. What are the applications of solvent extraction?
20. What is artificial transmutation?
21. What is the pH of 10^{-8} M HCl?
22. What is the mechanism of buffer action?

(8 × 2 = 16 Marks)

SECTION C

Short Essay (Not to exceed 120 words)

Answer any six questions from the following. Each question carries four marks.

23. Derive an equation for the first order rate constant.
24. Write a note on the effects of radiation giving special emphasize to pathological and genetic damage.
25. Explain the difference between auxochromoe and chromophore using examples.
26. What are the applications of UV visible spectroscopy?
27. Explain Azeotrope mixtures.
28. Explain Distribution law and its limitation.
29. Explain the Lowry – Bronstead concept of Acids and Bases.
30. What is neutron activation analysis?
31. Explain R_f and R_t values.

(6 × 4 = 24 Marks)

SECTION D

Long essay

Answer any two questions from the following. Each question carries 15 marks.

32. What is catalysis and catalyst? What are the different types of catalysis? Explain the intermediate formation theory and adsorption theory of catalysis.
33. Explain the detection of radioactivity by
 - (a) Wilson's cloud chamber.
 - (b) Geiger Muller counter.

34. Discuss the following
- (a) Paper chromatography
 - (b) Thin layer chromatography
 - (c) Ion exchange chromatography
35. Explain the principles of NMR spectroscopy and UV visible spectroscopy

(2 × 15 = 30 Marks)

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