

16U411

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Name: .....

Reg.No.....

**FOURTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2018**

(Regular/Supplementary/Improvement)

(CUCBCSS-UG)

**CC15U CHE4 C04 - PHYSICAL AND APPLIED CHEMISTRY**

(Chemistry - Complementary Course)

(2015 Admission onwards)

Time : Three Hours

Maximum : 64 Marks

**Section A**

Answer *all* questions. Each question carries 1 mark.

1. ----- is an example of partition chromatography.
2. ----- is a colloidal system where both dispersed phase and dispersion medium are liquids.
3. The coagulating power of  $\text{Na}^+$ ,  $\text{Mg}^{2+}$  and  $\text{Al}^{3+}$  in the coagulation of arsenic sulphide sol follow the order -----
4. The number of signal/s exhibited by protons in the NMR spectrum of propanal is/are -----
5. Which type of electronic transition between the HOMO and LUMO of a molecular species requires the lowest energy of excitation?
6. The vibrational spectra of molecules are observed in the ----- region of the electromagnetic spectrum.
7. Give example of a non-permitted food colour.
8. The monomer unit/s of bakelite is /are -----
9. Mention any one application of nomex.
10. ----- is the main culprit of ozone depletion.

**(10 x 1 = 10 Marks)**

**Section B**

Answer any *seven* questions. Each question carries 2 marks.

11. What is Tyndall effect?
12. Differentiate between lyophilic and lyophobic colloids with suitable examples.
13. The activation energy of a first order reaction is  $250 \text{ KJmol}^{-1}$ . The half life of the reaction is  $6.5 \times 10^6$  second at  $450^\circ\text{C}$ . What will be the half life at  $550^\circ\text{C}$ ?
14. Differentiate between Nylon66 and Nylon 6.
15. Discuss the structure and applications of Ajinomoto.
16. What is acid rain? What are its harmful effects?
17. Differentiate between BOD and COD?

18. What is Octane number? How is it related to the quality of gasoline?
19. Discuss the composition and health effects of tooth paste.
20. Mention any four harmful effects of pesticides.

**(7 x 2 = 14 Marks)**

**Section C**

Answer *any* four questions. Each question carries 5 marks.

21. Discuss the application of colloids.
22. Write notes on chemical shift, red shift and blue shift.
23. Outline of intermediate compound formation theory and adsorption theory of catalysis.
24. Discuss the theories of colour and chemical constitution.
25. Discuss the causes, effects and consequences of green house effect.
26. Discuss the manufacture of cement. Explain the chemistry involved in the setting of cement.

**(4 x 5 = 20 Marks)**

**Section D**

Answer any *two* questions. Each question carries 10 marks.

27. Discuss the structure and applications of synthetic rubbers. (b) Discuss the Importance of milk, coconut water and Neera.
28. (a) Discuss the application of NMR spectroscopy in organic structural elucidation taking suitable examples. (b) Give Arrhenius equation and explain the significance of the Arrhenius parameters.
29. Discuss the principle and applications of column chromatography and thin layer chromatography.
30. Discuss the significance of the concept of group frequencies in IR spectroscopy and its application in organic structural elucidation.

**(2 x 10 = 20 Marks)**

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