

C 4000

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Name.....

Reg. No.....

FOURTH SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2016

(CUCBCSS-UG)

Complementary Course

CHE 4C 04—PHYSICAL AND APPLIED CHEMISTRY

Time : Three Hours

Maximum : 64 Marks

**Section A (One Word)**

*Answer all questions.*

*Each question carries 1 mark.*

1. When light is passed through a colloidal dispersion it become visible as a bright streak. This phenomenon is known as \_\_\_\_\_.
2. The rate constant of a reaction is  $1.23 \times 10^{-4} \text{ s}^{-1}$ . The order of the reaction is \_\_\_\_\_.
3. In \_\_\_\_\_ chromatographic technique the mobile phase as well as stationary phase are in liquid state.
4. Absorption spectrum in uv region results from \_\_\_\_\_.
5. In rotational spectrum transitions are only observed between rotational energy levels with  $\Delta J =$  \_\_\_\_\_.
6. The main reason for algal blooming is the nourishment of water with \_\_\_\_\_.
7. Chlorofluro carbon is considered to be the major destroyer of \_\_\_\_\_ in the atmosphere.
8. The drug which can reduce the body temperature is generally called \_\_\_\_\_.
9. The shelf life of food materials is increased by the addition of \_\_\_\_\_.
10. The monomer of natural rubber is \_\_\_\_\_.

(10 × 1 = 10 marks)

**Section B (Short Answers)**

*Answer any seven questions.*

*Each question carries 2 marks.*

11. What do you mean by delta formation ?
12. Distinguish lyophilic and lyophobic colloids
13. In a first order reaction, the reactant takes 40.5 minutes to have 25% decomposition. Calculate the rate constant of the reaction.
14. How will you identify dimethyl ether and ethanol from the NMR spectra ?
15. State Beer Lamberts law and mention its application.

**Turn over**



16. With suitable examples classify the polymers based on the method of their formation.
17. Comment on the statement – Taj Mahal is losing its beauty due to atmospheric pollution.
18. Draw the structures of antioxidants BHA and BHT.
19. Write the important requirement of a dye.
20. Define cetane number.

(7 × 2 = 14 marks)

### Section C (Paragraph)

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

21. Write the important steps involved in the manufacture of cement.
22. Write the characteristics of a first order reaction.
23. Explain any two methods used for the purification of colloids.
24. Pesticides are essential for increasing the agricultural production but their use should be controlled. Why ?
25. Distinguish between homogeneous and heterogeneous catalysis with suitable examples. How will you explain the heterogeneous catalysis using adsorption theory ?
26. Draw the different modes of vibrations of carbon dioxide and explain why some vibrations are unobserved in IR spectrum.

(4 × 5 = 20 marks)

### Section D (Essay)

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

27. (a) Explain the influence of temperature on the rate of a chemical reaction.  
(b) Write notes on chemical Shift and spin-spin coupling.
28. Describe the different chromatographic methods used for the separation of organic mixtures.
29. Why biodegradable polymers are preferred over non-biodegradable polymers. Describe the manufacture and applications of any three biodegradable polymers.
30. What are drugs ? Write the important classes of drugs with suitable examples.

(2 × 10 = 20 marks)