C 4000

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 $1.23 \times 10^{\cdot} \ s^{-1}$. 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 x 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 x 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 h~terogeneous 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 x 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 x **10** = 20 marks)