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Reg. No:……………………..

Name: …………………………

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE
Fourth Semester B.Sc Degree Examination, March 2018
CHE4B04 – Organic Chemistry- I
(2016 Admission onwards)

Max. Time: 3 hours   Max. Marks: 80

Section A (One word)
Answer all questions. Each question carries 1 mark

1. The electrophile in Friedel-Craft's alkylation reaction of benzene with *n*-propyl chloride is ----------

2. ------------ is a functional isomer of acetone.

3. Dehydration of cyclohexyl carbinol with conc. H_2SO_4 gives ------- as the major product.

4. Write the structural formula of alkyl bromide which on warming with metallic sodium in dry ether yield 3,6-dimethyloctane.

5. Draw the structure of a polycyclic aromatic carcinogen.

6. The hybridization of second carbon atom in but-1-en-3-yne is ----------------

7. 1,2-Dimethylcyclohexene on reductive ozonolysis yield ------- as the product.

8. Most stable cycloalkane according to Baeyer's strain theory is ---------

9. Rearrangement of *iso*butyl carbocation yield ---------------- carbocation.

10. Dehalogenation of *d*- 2,3-dibromobutane with zinc dust yield ----------

(10 x 1 = 10 Marks)

Section B (Short answer)
Answer any ten questions. Each question carries 2 marks

11. Write the mechanism of addition of HBr to propene in presence of organic peroxide.

12. Draw the staggered and eclipsed conformation of ethane in the *Newmann projection* formula?

13. Compare the basicity of pyrrole and pyridine using Huckel's rule.

14. What is Diels-Alder reaction? Illustrate with an example.

15. Discuss the Haworth synthesis of naphthalene.

16. What are annulenes? Give examples.

17. What is meant by *cis* hydroxylation? What are the reagents used for this reaction?

18. What is the chemistry behind the decolourisation of Baeyer's reagent with propyne?

19. What is tautomerism. Illustrate with an example.

20. An organic compound with molecular formula C_6H_{12} on ozonolysis yield one mol each of 3-pentanone and methanal. Write the structural formula of C_6H_{12} and explain the reaction.

21. Draw *d*-tartaric acid and represent in RS configuration?

22. Starting from carbon and hydrogen, how is diethyl acetylene synthesized?

(10 x 2 = 20 Marks)

Section C (Paragraph)
Answer any five questions. Each question carries 6 marks

23. What is hyperconjugation? Using this concept discuss the stability of propene and ethyl carbocation?

24. Discuss the mechanism of nitration and sulphonation of naphthalene.

25. Discuss the optical isomerism in allenes and biphenyls.

26. Discuss Huckel's rule taking any four benzenoid aromatic compounds.

27. Discuss the mechanism of hydration of alkenes in presence of dilute mineral acid taking suitable examples.

28. Discuss the stability and important reactions of carbenes.

29. With suitable example discuss the 1,4-addition of 1,3-butadiene.

30. What is Mesomeric effect? Using this concept compare the (i) stability of benzyl and *p*-nitrobenzyl carbocation? (ii) basicity of aniline, *p*-nitroaniline and *p*-anisidine.

(5 x 6 = 30 Marks)

Section D (Essay)
Answer any two questions. Each question carries 10 marks

31. Write notes on

    (a) ring activating and deactivating groups.

    (b) *ortho*, *para* and *meta* directing groups.

    (b) methods used for the resolution of racemic mixtures.

32. (a) Compare of electron density in benzene, toluene, phenol, chlorobenzene and nitrobenzene. Justify your answer.

    (b) Discuss the addition of halogens to alkene with mechanism and stereochemistry.

33. (a) Compare the electrophilic addition rate of alkenes and alkynes.

    (b) Discuss the various methods used for the distinction of geometrical isomers.

34. (a) What is electromeric effect? Illustrate the concept using nucleophilic and electrophilic additions.

    (b) Discuss the structure and stability of benzene using Resonance and Molecular Orbital concepts.

(2 x 10 = 20 Marks)

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FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE
Fourth Semester B.Sc Degree Examination, March 2018
CHE4C04 – Physical & Applied Chemistry
(2016 Admission onwards)

Max. Time: 3 hours   Max. Marks: 64

Section A (One Word)
Answer all questions. Each question carries 1 mark.

1. The phenomenon of .... is due to scattering of light by colloidal particles.

2. Substance which increases the activity of a catalyst is called ....

3. .... is the physical phenomenon behind liquid-liquid chromatography.

4. A compound containing at least one chromophore is called ....

5. Drugs used for the treatment of hyperacidity are called ....

6. .... is considered to have cetane number of 100.

7. Minamata disease was caused by the accumulation of .... metal.

8. Caprolactam is the monomer of ....

9. TMS stands for ....

10. Unit of rate constant for a second order reaction is ....

                                                    (10 x 1 = 10 Marks)

Section B (Short answer)
Answer any seven questions. Each question carries 2 marks.

11. Define chemical shift.

12. Give the preparation of neoprene.

13. What is greenhouse effect?

14. The half life of a first order reaction is 7.5×10^6 second. Calculate rate constant.

15. Name any four artificial sweeteners.

16. Give the structure of DDT.

17. What are pseudo order reactions?

18. What is elution?

19. Define gold number.

20. What is fundamental transition?

                                                    (7 x 2 = 14 Marks)

Section C (Paragraph)
Answer any four questions. Each question carries 5 marks

21. Explain any two methods used for the purification of sols.

22. Give a note on the theory of heterogeneous catalysis.

23. Describe the theory and principle of thin layer chromatography.

24. Explain and sketch the vibrational modes of CO_2 and H_2O.

25. Write a note on biodegradable polymers with suitable examples.

26. Briefly explain about various water quality parameters.

(4 x 5 = 20 Marks)

Section D (Essay)
Answer any two questions. Each question carries 10 marks.

27. (a)Explain the classification of detergents (5)

    (b)Briefly explain the theories of colour and chemical constitution. (5)

28. Write a note on thermal and radioactive pollution (5+5 marks).

29. Explain the theory, instrumentation and applications of gas chromatography.

30. a)Write a note on classification of polymers. (5)

    b)Discuss the applications of Colloids. (5)

(2 x 10 = 20 Marks)