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4M19141 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Fourth Semester B.Sc Degree Examination, March /April 2019

BCHE4B04 – Organic Chemistry- I

(2017 Admission onwards)

me: 3 hours Max. Marks: 80

Section A (One word)

Answer all questions. Each question carries 1 mark

1. Write the structural formula of the alkyl bromide which on warming with metallic sodium in dry ether yield 2,7-dimethyloctane.
2. Draw the structure of a polycyclic aromatic carcinogen.
3. The hybridization of third carbon atom in vinyl acetylene is ----------
4. Dehalogenation of *Meso* 2,3-dibromobutane with zinc dust yield ----------
5. ---------- is a functional isomer of methyl formate.
6. Most stable cycloalkane according to Baeyer's strain theory is ---------
7. Rearrangement of *Neo*pentyl carbocation yield ---------- carbocation.
8. Dehydration of 2,2-dimethylcyclhexanol with conc. H_2SO_4 gives ------- as the major product.
9. 1-Methylcyclohexene on reductive ozonolysis yield ------- as the product.
10. The electrophile in Friedel-Craft's acylation reaction is ---------

(10 x 1 = 10 Marks)

Section B (Short answer)

Answer any ten questions. Each question carries 2 marks

11. 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.
12. Discuss the Haworth synthesis of naphthalene.
13. What are anti aromatic compounds? Give an example.
14. What is the chemistry behind the decolourisation of Baeyer's reagent with acetylene?
15. 2,4-Cyclohexadienone exists mainly in the enol form. Justify the statement.
16. Draw the staggered and eclipsed conformation of ethane in the Sawhorse model?
17. Draw *l*-tartaric acid and represent in RS configuration?
18. What is Diels-Alder reaction? Illustrate with an example.
19. Compare the basicity of indole and quinoline using Huckel's rule.
20. Starting from carbon and hydrogen. how is ethyl isopropyl acetylene synthesized?
21. Write the mechanism of addition of HBr to propene in the absence of organic peroxide.
22. What is meant by *trans* hydroxylation? What are the reagents used for this reaction?

(10 x 2 =20 Marks)

Section C (Paragraph)

Answer any five questions. Each question carries 6 marks

23. What is Inductive effect? What are its characteristics? Using this compare the acidity of (i) formic acid and acetic acid (ii) chlorobutanoic acids?
24. Discuss the optical isomerism in allenes and biphenyls.
25. Compare of electron density in benzene, toluene, phenol, chlorobenzene and nitrobenzene. Justify your answer.
26. Discuss the stability and important reactions of free radicals.
27. Discuss the structure and stability of benzene using Resonance and Molecular Orbital concepts.
28. With suitable example discuss the 1,4-addition of 1,3-butadiene.
29. Discuss the addition of halogens to alkene with mechanism and stereochemistry.
30. Discuss the various methods used for the distinction of geometrical isomers.

(5 x 6 =30 Marks)

Section D (Essay)

Answer any two questions. Each question carries 10 marks

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

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

32. Write notes on

    (a) ring activating and deactivating groups

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

    (c) What is hyperconjugation? Using this concept discuss the stability of propene and ethyl carbocation?

33. (a) Discuss the mechanism of hydration of alkenes in presence of dilute mineral acids taking suitable examples.

    (b) Discuss Huckel's rule taking any four benzenoid aromatic compounds.

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

    (b) Discuss the mechanism of nitration and sulphonation of naphthalene.

(2 x 10 = 20 Mark

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Fourth Semester B.Sc Degree Examination, March /April 2019

BCHE4C04 – Physical & Applied Chemistry

(2017 Admission onwards)

e: 3 hours Max. Marks: 64

Section A (One Word)

Answer all questions. Each question carries 1 mark.

1. Shift of absorption from lower to higher wavelength is called .....
2. MSG stands for .....
3. ..... is a super cooled liquid.
4. ..... are the monomers of Buna-S.
5. The two kinds of fundamental vibrations in a molecule are .....and.....
6. For a ..... order reaction, half life is independent of initial concentration of the reactant.
7. The zig-zag motion shown by the colloidal particles is called .....
8. The chemical name of aspirin is .....
9. Polymers in which monomers connected by weak forces are called .....
10. NMR spectroscopy arises due to the absorption of light in the ..... region.

(10 x 1 = 10 Marks)

Section B (Short answer)

Answer any seven questions. Each question carries 2 marks.

11. What is electrophoresis?
12. Differentiate between order and molecularity.
13. Define retardation factor.
14. What are overtones?
15. What is auxochrome? Give two examples.
16. Give the preparation of Buna N.
17. What is eutrophication?
18. Define prodrug with an example.
19. Give the structure of endosulphan.
20. Define cetane number.

(7 x 2 = 14 Marks)

Section C (Paragraph)

Answer any four questions. Each question carries 5 marks

21. Explain the manufacturing of cement.
22. Write a note on biomagnification and bioaccumulation.
23. Explain the preparation of bakelite and melmac.
24. Give a short note on the proton NMR spectrum of ethanol and acetone.
25. Write a note on paper chromatography.
26. Explain electrical double layer theory.

(4 x 5 = 20 Marks)

Section D (Essay)

Answer any two questions. Each question carries 10 marks.

27. (a)Explain integrated rate equation for first order reaction (6 marks).
    (b)Briefly explain theory of homogeneous catalysis (4 marks)
28. Write a note on proton NMR spectroscopy.
29. (a)Explain biodegradable polymers with suitable examples (6 marks).

    (b)Give the preparation, properties and applications of Kevlar and Nomex (4 marks).
30. (a)Briefly explain the naming of drugs with an example (3 marks)

    (b)Give the classification of drugs (7 marks).

(2 x 10 = 20 Marks)