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BP 202 T

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2023

B.Pharm 2nd Semester End-Term Examination

PHARMACEUTICAL ORGANIC CHEMISTRY-I

Full Marks – 75

Time – Three hours

The figures in the margin indicate full marks for the questions.

1. Choose the correct alternatives of the following: (20 × 1 = 20)
- (i) How many isomers are possible for pentane?
- (a) 2 (b) 3
(c) 4 (d) 5
- (ii) Which of the following reactions can be used to prepare alkanes?
- (a) Wurtz reaction (b) Wolf-Kishner reduction
(c) Kolbe's electrolysis (d) All of these
- (iii) Conjugated alkenes are characterized by?
- (a) Alternating π and σ bonds.
(b) π bonds separated by two or more σ bonds.
(c) Adjacent π bonds.
(d) A cyclic system containing 6 π electrons.
- (iv) Which statement is false?
- (a) Many alkanes are soluble in water
(b) All alkanes have a lower density than water
(c) At room temperature some alkanes are liquids, some solids, some gases.
(d) All alkanes burn.

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- (v) The reduction of a Ketones
- (a) Always gives a primary alcohol.
 - (b) Always gives a carboxylic acid.
 - (c) Always gives a secondary alcohol.
 - (d) Always gives a ketal.
- (vi) The characteristics reaction of carboxylic acids is:
- (a) Electrophilic addition
 - (b) Electrophilic substitution
 - (c) Nucleophilic addition
 - (d) Nucleophilic substitution.
- (vii) 2 - Butene reacts with HBr to give
- (a) 1- bromobutane
 - (b) 2- Bromobutane
 - (c) 2,3- Dibromobutane
 - (d) 2,2- Dibromobutane
- (viii) Luca's test is used to determine the type of
- (a) Alcohols
 - (b) Acids
 - (c) Amines
 - (d) Carbohydrates.
- (ix) The carbon atom of a carbonyl group is
- (a) Sp hybridised
 - (b) Sp² hybridised
 - (c) Sp³ hybridised
 - (d) None of these.
- (x) How many isomers are possible for hexane?
- (a) 4
 - (b) 5
 - (c) 6
 - (d) 7
- (xi) The major product of acid-catalysed dehydration of 2-butanol is:
- (a) 2-butene
 - (b) 2 butyne
 - (c) 1- butene
 - (d) 1- butyne.

(xii) Where Markovnikov's rule is applied?

- (a) When ethene reacts with HBr
- (b) When propene reacts with HBr
- (c) When 2-Butene reacts with HBr
- (d) All the above

(xiii) Primary alkyl halides basically show.

- (a) SN1 reaction
- (b) SN2 reaction
- (c) E1 reaction
- (d) None of the above

(xiv) CH₄ reacts with Cl₂ in the presence of UV light to form methyl chloride. This is

- (a) Free radical substitution reaction
- (b) Electrophilic addition reaction
- (c) Nucleophilic addition reaction
- (d) Nucleophilic substitution reaction

(xv) The following is called wood alcohol

- (a) Methanol
- (b) Ethanol
- (c) Propanol
- (d) Butanol

(xvi) Propadiene, CH₂=C=CH₂, is

- (a) A planar compound.
- (b) An isolated diene
- (c) A cumulated diene
- (d) A conjugated diene

(xvii) Carbocation is

- (a) Negatively charged.
- (b) Positively charged.
- (c) Neutral
- (d) None of the above

(xviii) Which of the following will give acetic acid on acid-catalyzed hydrolysis?

- (a) Ethyl acetate
- (b) Acetone
- (c) Methyl propionate
- (d) Lactic acid

(xix) Oxidation of secondary alcohol with K₂CrO₇/H⁺ produces.

- (a) A carboxylic acid
- (b) A ketone
- (c) An aldehyde
- (d) An ester

(xx) The disappearance of the purple colour of KMnO_4 in its reaction with alkene is known as

- (a) Markovnikov test (b) Grignard test
(c) Baeyer test (d) Wurtz test.

2. Answer the following questions:(Any seven) $(7 \times 5 = 35)$

- (i) Explain Crossed Aldol condensation and crossed Cannizzaro reaction with mechanism. (5)
(ii) What is Saytzeff's orientation? Where is it applied? Explain with mechanism. (5)
(iii) Differentiate electromeric effect and mesomeric effect citing proper example. (5)
(iv) Explain the acidity of carboxylic acid and the effect of substituents on acidity. (5)
(v) Write down the structures and uses of the following compound: $(5 \times 1 = 5)$
(a) Vaniline
(b) Tartaric acid
(c) Aspirin
(d) Glycerol
(e) Cinnamaldehyde
(vi) Explain the stability of carbocation with hyperconjugation. Describe metamerism and tautomerism with example. (5)
(vii) Describe the stereochemistry of SN_1 and SN_2 reaction citing example. (5)
(viii) Explain five methods of preparation of alkenes. (5)
(ix) Describe five important chemical reactions of aliphatic amines. (5)

3. Answer the following questions:(Any two) $(2 \times 10 = 20)$

- (i) Explain sp^3 , sp^2 and sp hybridization with suitable example of each. (6)
(ii) Explain Anti-Markovnikov's rule with mechanism. (4)
(iii) Explain five nucleophilic addition reactions of carbonyl compound with mechanism. (10)
(iv) Explain the mechanism of the following reactions: $(4 \times 2.5 = 10)$
(a) Benzoin condensation
(b) Perkin condensation
(c) Chlorination of methane
(d) Diels-Alder reaction