

Subject: CHEMISTRY

Organic Chemistry

PAPER II

II semester

A. Multiple Choice Questions

1. Which of the following is not an electrophile?

- (a) NO_2^+ ()
- (b) AlCl_3 ()
- (c) Br^+ ()
- (d) NH_3 ()

2. Which of the following is not a nucleophile?

- (a) CN^- ()
- (b) BF_3 ()
- (c) HSO_3^- ()
- (d) OH^- ()

3. Which of the following ranges best represents the strength of H-bonding?

- (a) 5 – 10 kcal ()
- (b) 100 – 120 kcal ()
- (c) 80 – 100 kcal ()
- (d) 60 – 80 kcal ()

4. Atoms which lose electrons toward a carbon atom are said to have a

- (a) +I effect ()
- (b) +M effect ()
- (c) –I effect ()
- (d) –M effect ()

5. Which alkyl free radical is the most stable?

- (a) methyl ()
- (b) primary ()
- (c) secondary ()
- (d) tertiary ()

6. Lewis bases can be regarded as

- (a) nucleophiles ()
- (b) electrophiles ()
- (c) free radicals ()
- (d) None of the above ()

7. The rate law for catalytic halogenation of benzene is often of the form

- (a) $\text{Rate} = k[\text{PhH}][\text{X}_2]^2[\text{L.A.}]$ ()

- (b) $\text{Rate} = k[\text{PhH}][\text{X}_2][\text{L.A.}]$ ()
 (c) $\text{Rate} = k[\text{PhH}]^2[\text{X}_2][\text{L.A.}]$ ()
 (d) $\text{Rate} = k[\text{PhH}][\text{X}_2]$ ()
8. The carbon atoms in a benzene ring are
 (a) *sp* hybridized ()
 (b) *sp*³ hybridized ()
 (c) *sp*² hybridized ()
 (d) *dsp*² hybridized ()
9. Characteristic reactions of aromatic hydrocarbons are initiated by
 (a) nucleophiles ()
 (b) uncharged molecules ()
 (c) free radicals ()
 (d) electrophiles ()
10. Toluene reacts with chlorine in presence of AlCl_3 to give
 (a) *o*- & *p*-chlorotoluene ()
 (b) *o*- & *m*-chlorotoluene ()
 (c) *o*- chlorotoluene ()
 (d) *m*- & *p*-chlorotoluene ()
11. The reaction between aldehyde and HCN to form Cyanohydrin is an example of
 (a) Nucleophilic substitution ()
 (b) Nucleophilic addition ()
 (c) Addition elimination ()
 (d) Elimination ()
12. The correct order of acidic strength is
 (a) Phenol < Ethanol < Chloroacetic acid < Acetic acid ()
 (b) Ethanol < Phenol < Chloroacetic acid < Acetic acid ()
 (c) Ethanol < phenol < acetic acid < Chloroacetic acid ()
 (d) Chloroacetic acid < Acetic acid < Phenol < Ethanol ()
13. Correct order of decreasing reactivity of nucleophilic addition reaction is
 (a) $\text{CH}_3\text{COCH}_3 > \text{CH}_3\text{CHO} > \text{HCHO}$ ()
 (b) $\text{HCHO} > \text{CH}_3\text{CHO} > \text{CH}_3\text{COCH}_3$ ()
 (c) $\text{CH}_3\text{COCH}_3 > \text{HCHO} > \text{CH}_3\text{CHO}$ ()
 (d) $\text{CH}_3\text{CHO} > \text{HCHO} > \text{CH}_3\text{COCH}_3$ ()
14. Which of the following compound is most reactive towards nucleophilic addition reaction?
 (a) Acetaldehyde ()
 (b) Acetone ()
 (c) Benzene ()
 (d) Benzaldehyde ()

15. What is the product on oxidation of primary alcohols?

- (a) Aldehydes ()
- (b) Amines ()
- (c) Ketone ()
- (d) Benzene ()

16. The hybridization state of nitrogen atom of ammonia is

- (a) sp^3 ()
- (b) sp^2 ()
- (c) sp^3d ()
- (d) dsp^2 ()

17. Schiff's base can be obtained by reacting 1° amine with

- (a) cyanide ()
- (b) alcohol ()
- (c) carboxylic acid ()
- (d) aldehyde ()

18. Aniline reacts with nitrous acid at low temperatures to give

- (a) nitrile ()
- (b) N-nitrosoamine ()
- (c) diazonium salt ()
- (d) cyanide ()

19. The reaction of amine with C_6H_5COCl is known as

- (a) sulphonation ()
- (b) benzylation ()
- (c) benzoylation ()
- (d) None of the above ()

20. The major product obtained on nitration of aniline with a mixture of nitric acid and sulphuric acid is

- (a) *m*-Nitroaniline ()
- (b) *o*-Nitroaniline ()
- (c) *p*-Nitroaniline ()
- (d) None of the above ()

21. SN_2 reaction is always followed by

- (a) Retention of configuration ()
- (b) Formation of carbocation ()
- (c) Inversion of configuration ()
- (d) None of the above ()

22. SN_1 reaction is favoured by

- (a) Primary haloalkane ()
- (b) Secondary haloalkane ()
- (c) Tertiary haloalkane ()

- (d) All of the above ()
23. Nucleophiles are always
- (a) Lone pair donor ()
- (b) Electron poor ()
- (c) Lewis acid ()
- (d) Negatively charged ions ()
24. Select the correct statement
- (a) SN_2 reaction follows second order kinetics ()
- (b) No intermediate is involved in SN_2 mechanism ()
- (c) SN_2 reaction are one-step reaction ()
- (d) All of the above ()
25. The reactivity order of alkyl halide in SN_2 reaction is
- (a) $\text{CH}_3\text{X} > 1^\circ > 2^\circ > 3^\circ$ ()
- (b) $\text{CH}_3\text{X} > 2^\circ > 1^\circ > 3^\circ$ ()
- (c) $\text{CH}_3\text{X} > 3^\circ > 1^\circ > 2^\circ$ ()
- (d) $\text{CH}_3\text{X} > 3^\circ > 2^\circ > 1^\circ$ ()

B. Fill Up the Blanks

- The phenomenon in which two or more structures can be written for a substance which involve identical positions of atoms is called _____
- According to Huckle Rule, a cyclic π molecular orbital formed by overlap of p orbitals must contain _____ π electrons.
- When benzene is treated with methyl chloride in presence of AlCl_3 , _____ is formed.
- Amines converted into amides by treatment with aromatic acid chlorides or sulphonyl chlorides in presence of base, the reaction is also called _____ reaction.
- When aniline is heated with CHCl_3 and alc. KOH , the product is _____
- Hinsberg reagent is _____
- The product of heterolytic fissions are _____.
- The more hyperconjugation structures that can be written for a species, the _____ is the species.
- Electromeric effect involves the _____ of a double or triple bond.
- In aldehydes and ketones, carbon of the carbonyl group is _____ hybridised.
- HCHO is known as _____
- Benzoic acid reacts with ammonia gives _____
- A primary halide will react with _____ mechanism.
- A low concentration of nucleophile favours _____ reaction.
- Reaction of alcohol with SOCl_2 is _____ mechanism.

Key Answers

A. Multiple choice questions

1. (d) 2. (b) 3. (a) 4. (b) 5. (d) 6. (a) 7. (b)
8. (c) 9. (d) 10. (a) 11. (a) 12. (c) 13. (b) 14. (c)
15. (a) 16. (a) 17. (d) 18. (c) 19. (b) 20. (a) 21. (c)
22. (c) 23. (d) 24. (d) 25. (a)

B. Fill Up the Blanks

1. Resonance
2. $4n+2$
3. Toluene
4. Scotten-Baumen
5. Phenylisocyanide
6. Toluene sulphonyl chloride
7. Ions
8. More stable
9. Π electrons
10. sp^2
11. formaldehyde
12. Benzamide
13. SN_2
14. SN_1
15. SN_i