S.Y. B. Pharmacy
Sem – III
22/12/2025

Time: 3 Hours **Marks: 75**

Q. I Multiple choice questions **20 Marks**

1. Which of the following isomer of BHC is known as lindane?
   (a) Alpha (b) Beta (c) Gamma (d) Delta
2. Benzene's aromatic stability is due to:
   (a) Localized π-electrons
   (b) Complete delocalization of 6 π-electrons
   (c) Presence of alternate double bonds
   (d) sp^3 hybridization
3. Huckel's rule states that aromatic compounds have:
   (a) 4n π electrons (b) 2n π electrons
   (c) 4n+2 π electrons (d) 8n π electrons
4. Nitration of benzene involves which electrophile?
   (a) NO_2^- (b) NO_2^+ (c) NO^+ (d) N_2O_5
5. What is the commercial method of preparation of phenol?
   (a) Dows process (b) From diazonium salt
   (c) By decarboxylation of salicylic acid (d) Hock method
6. Identify the correct IUPAC name of resorcinol
   (a) Benzene-1,3-dione
   (b) Benzene-1,3-diol
   (c) Benzene-1,5-diol
   (d) Benzene-1,3-diol
7. Replacement of diazonium group by -Cl using cuprous halide is called as_____
   (a) Sandmeyer reaction
   (b) Hoffman degradation reaction
   (c) Riemer Tieman reaction
   (d) Diazotization reaction
8. Trichloroacetic acid is stronger than acetic acid due to
   (a) Electronegativity
   (b) Bond energies
   (c) Inductive effect
   (d) Hybridization
9. 2.5 g coconut oil is titrated with 0.1 N KOH solution. If the burette reading 4.2 mL of KOH to reach the endpoint, calculate the acid value
   (a) 9.4 (b) 0.94 (c) 23.5 (d) 2.35
10. Choose the correct formula for saponification value
    (a) Ester value – acid value
    (b) Ester value + acid value
    (c) Acid value ÷ Ester value
    (d) Ester value ÷ acid value

11. Which of the following is not method of iodine value determination?
(a) Iodine monochloride
(b) Iodine monobromide
(c) Iodine monofluoride
(d) Pyridine bromide

12. The unpleasant smell of rancid oils is due to formation of
(a) Alcohols
(b) Aldehydes and ketones
(c) Esters
(d) Amines

13. _____scaffold found in morphine ring
(a) Benzene (b) Naphthalene (c) Anthracene (d) Phenanthrene

14. Which of the following is present in crystal violet indicators?
(a) Diphenyl methane (b)Triphenyl methane (c) Diphenyl ethane (d)Phenanthrene

15. How many resonances structure possible in anthracene?
(a) 2 (b) 4 (c) 5 (d) 6

16. Which of following prepared by Elbe method
(a) Naphthalene (b) Phenanthrene (c) Anthracene (d) Diphenyl methane

17. Bond angle between carbon-atoms in cyclopropane is _____.
(a) 90^0 (b) 109.5^0 (c) 120^0 (d) 180^0

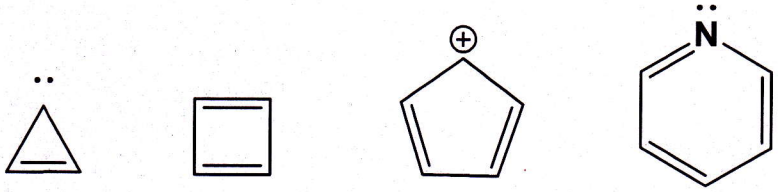
18. Which of the following cycloalkanes exhibits ring puckering, leading to variations in bond angles?
(a) Cyclopropane (b) Cyclobutene (c) Cyclopentane (d) Cyclohexane

19. Strain arising from eclipsed interactions between atoms in adjacent carbon-carbon bonds in a cycloalkane is known as?
(a) Torsional strain (b) Steric strain (c) Conformational strain (d) Angle strain

20. Banana bond theory was proposed by ____
(a) Coulson and Moffitt
(b) Baeyer
(c) Sachse
(d) Mohr

Q. II **Compulsory questions** **Marks 20**

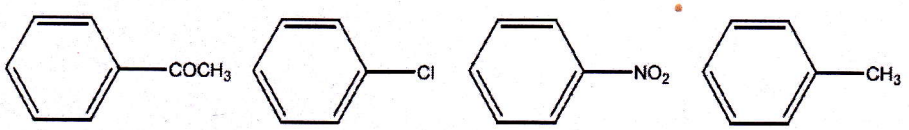
1. (a) Explain the aromaticity in benzene with reference to Huckel's Rule, Bond lengths, Heat of hydrogenation and resonance.
   (b) Give the general mechanism of electrophilic aromatic substitution reactions. Categorize the following groups as activating or deactivating and as ortho/para or meta-directing towards electrophilic aromatic reactions.
   (i) –NH2 (ii) –CN (iii) -$NHCOCH_3$ (iv) –SO_3H (v) -OC_2H_5 (vi) –COOH
2. (a) Identify whether following compounds are aromatic, antiaromatic or nonaromatic



(b) Draw the structure and general uses of DDT and BHC

III **Attempt any seven questions** **35 Marks**

1. Write a note on basicity of aromatic amines and enlist various factors affecting the basicity and explain any three with suitable examples
2. Identify the molecule which is least reactive towards electrophilic aromatic substitution. Justify your answer. Use the least reactive molecule to synthesize benzonitrile.



3. Explain diazotization with reaction condition? Comment on various synthetic applications
4. What is acid value? Explain the procedure to determine acid value with its significance for analysis of oils
5. Explain partial and complete hydrogenation of oil with suitable reaction. Write the significance of determination of acetyl value.
6. Draw the possible resonance structure of anthracene and discuss any two oxidation and reduction reactions
7. Predict the product/s of the following reaction:
   (a) Naphthalene + CrO_3 /CH_3COOH ⟶
   (b) Naphthalene + C_2H_5COCl /$AlCl_3$ in nitrobenzene ⟶
   (c) Naphthalene + Na / C_2H_5OH ⟶
   (d)1-Naphthalene sulphonic acid + Br_2 /CCl_4 ⟶
8. Draw the conformations of cyclohexane and comment on their stabilities
9. Explain the Coulson-Moffitt and Saches-Mohr theories