

B. Sc. CHEMISTRY
FOURTH SEMESTER
ORGANIC CHEMISTRY III
BSC - 402

(Use Separate Answer Scripts for Objective & Descriptive)

Duration : 3 hrs.

Full Marks : 70

[PART-A: Objective]

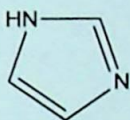
Time : 20 min.

Marks : 20

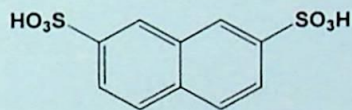
Choose the correct answer from the following:

1X20=20


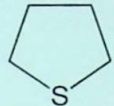
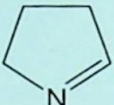
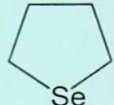
- Naphthalene is a
 - Isolated benzenoid system
 - Fused non-benzenoid system
 - Fused benzenoid system
 - Isolated benzenoid system
- Pyridine is a
 - weak base
 - weak acid
 - neutral molecule
 - Strong base
- The nature of Indole is
 - Non-aromatic
 - Aromatic
 - Anti-aromatic
 - Aliphatic
- Common name of the following structure is



- Pyrrrole
 - Imidazole
 - pyrazole
 - oxazole
- Molecular formula of isoprene unit is
 - C_5H_8
 - C_5H_{10}
 - C_5H_5
 - C_5H_{12}
 - The correct nomenclature of the following compound is



- Naphthalene-2,7- disulfonic acid
 - Naphthalene-2,8- disulfonic acid
 - Naphthalene-3,7- disulfonic acid
 - Naphthalene-1,7- disulfonic acid
- The structure of Naphthalene has
 - 4α and 2β position
 - 4α and 4β position
 - 2α and 2β position
 - 2α and 4β position

8. Anthracene is a
- Linear non-aromatic system
 - Linear benzenoid fused system
 - Non-linear benzenoid fused system
 - Non-linear non-benzenoid fused system
9. The structure of THF is
- 
 - 
 - 
 - 
10. Hantzsch synthesis is related to
- Anthracene
 - Phenanthrene
 - Benzene
 - Pyridine
11. Alkaloids are
- natural products, found in animals, that contain one or more alcohol groups
 - natural products, found in animals, that contain one or more nitrogen heteroatoms
 - natural products, found in plants, that contain one or more nitrogen heteroatoms
 - alcohol-like compounds
12. Quinine is obtained from the bark of which tree?
- Cinchona
 - Redwood
 - Banyan
 - Eucalyptus
13. Nicotine causes which of these changes in the body?
- lowers body temperature
 - increases heart rate
 - increases blood pressure
 - increases heart rate and blood pressure
14. The alkaloid used as a sedative is
- Cocaine
 - Hygrine
 - Morphine
 - Atropine
15. What happens when nicotine comes into contact with the brain?
- tissues swell
 - dopamine is released
 - nerve centers shut down
 - adrenaline increases
16. The alkaloid Quinine is used in the treatment of
- Malaria
 - High blood pressure
 - Parkinson disease
 - Alzheimer
17. Nitriles can be prepared by
- the hydration of amines
 - the dehydration of acids
 - the reduction of acids
 - the dehydration of amides

18. Acetamide reacts with Br_2/NaOH to give
- a. Methylamine
 - b. Urea
 - c. Ethylamine
 - d. Acetyl bromide
19. Acetonitrile undergoes reduction with LiAlH_4 to form
- a. Methylamine
 - b. Dimethylamine
 - c. Ethylamine
 - d. Trimethylamine
20. Which type of amines produces N_2 when treated with HNO_2 ?
- a. Quaternary
 - b. Tertiary
 - c. Secondary
 - d. Primary

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(PART-B : Descriptive)

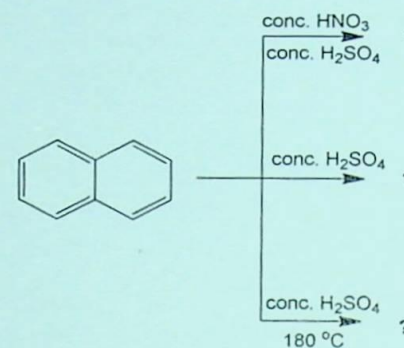
Time : 2 hrs. 40 min.

Marks : 50

[Answer question no.1 & any four (4) from the rest]

1. a. Write down the products:

5+5=10



b. What is Gabriel phthalimide synthesis? How will you synthesize aliphatic primary amine by this method? Explain why aromatic primary amine cannot be prepared by this method?

2. a. What is Citral? Draw the structure of *cis* and *trans*-form of Citral. Describe its synthesis.

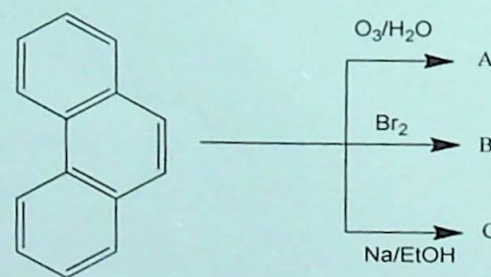
5+5=10

b. Draw the structure of α -terpineol. Describe the synthesis procedure and mention its uses

3. a. Explain Haworth synthesis of naphthalene

6+4=10

b. Write down A, B and C



[4]

4. a. How the name 'indole' given? Describe Fischer indole synthesis with detailed mechanism. 5+5=10
- b. Write down short note on Knorr-quinoline synthesis and its mechanism
5. a. Draw the structures of pyrazole and oxazole. Describe the Knorr pyrrole synthesis with mechanism. 5+5=10
- b. What is benzene diazonium salts? How are they produced? Starting from benzene diazonium chloride how will you synthesize (i) chlorobenzene and (ii) phenol. Give chemical reaction.
6. a. What are alkaloids? Discuss the general features of alkaloids. 5+5=10
- b. How are alkaloids isolated from plants? Describe their general properties.
7. a. What is Mannich reaction? Write the mechanism of the reaction. Can you use an aldehyde other than formaldehyde? 5+3+2=10
- b. Write a note on Hofmann's elimination reaction.
- c. How does nitrous acid react with primary amine? Give the chemical equation.
8. a. Discuss the effect of substituent and solvent on the basicity of amines. Give reason why order of the basic strength in case of methyl substituted amines in aqueous solution is as follows: $(\text{CH}_3)_2\text{NH} > \text{CH}_3\text{NH}_2 > (\text{CH}_3)_3\text{N} > \text{NH}_3$. 5+5=10
- b. Write the carbylamine reaction. Explain why this reaction can be used as a test for only primary amine but not for secondary and tertiary amine?

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