Name : ....

Roll No. : ....

Invigilator's Signature : ....

CS/B.PHARM (NEW)/SEM-3/PT-304/2010-11

2010-11
PHARMACEUTICAL CHEMISTRY (ORGANIC)

Time Allotted : 3 Hours   *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1.   Choose the correct alternatives for any *ten* of the following :

$$10 \times 1 = 10$$

i)   The linkage in cellulose is

    a) β-1, 4-linkage   b) α-1, 4-linkage

    c) β-1, 6-linkage   d) α-1, 6-linkage.

ii)   Arrange according to their preference for naming the following heteroatoms :

    a)   O>S>Se>N>P>Si>B   b)   O>Se>S>P>N>Si>B

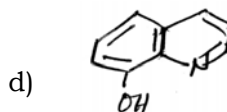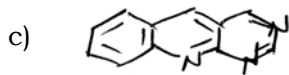   c)   N>P>Si>S>Se>B>O   d)   O>S>Se>P>N>Si>B.

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iii) Reaction by which shortening of carbon chain is carried

out is known as

a) Killiani-Fischer synthesis

b) Ruff degradation

c) Fischer-Indole synthesis

d) Sowden-Fischer synthesis.

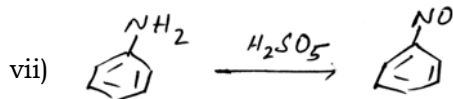iv) Which of the following is not a heterocyclic compound ?

a)   b)

c)   d) .

v) Haworth synthesis is employed for the preparation of

a) Naphthalene   b) Anthracene

c) Phenanthrene   d) Both (a) and (c).

vi) The following aromatic nitrocompound in an explosive is

a) o-nitrotoluene

b) p-nitrotoluene

c) 2, 4 - dinitrotoluene

d) 2, 4, 6 – trinitrotoluene.

vii)

In the above reaction, the reagent H_2SO_5 is known as

a) Sulphuric acid b) Sulphurrous acid

c) Sulphonic acid d) Caro's acid.

viii) In the SN 2 reaction, bond formation and bond breakage takes place in

a) one step b) two steps

c) three steps d) four steps.

ix) The heterocycle that undergoes Dieb-Alder Reaction is

a) Furan b) Pyrrole

c) Thiophene d) Pyridazine.

x) Identify the incorrect statement :

a) Replacement nomenclature is applied when systematic nomenclature fails to name a compound

b) Replacement nomenclature is applied for fused ring heterocycles

c) In replacement nomenclature, Pyridine becomes 1-aza benzene

d) Replacement nomenclature system solves complications arise due to Hantzsch – Widman nomenclature.
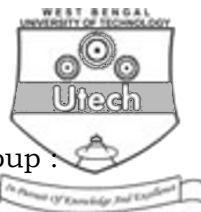
xi) Give an example of electron releasing group :

a) NO_2

b) SO_3H

c) NH_2

d) None of these.

xii) Reimer-Tiemann reaction is carried out in presence of which of the fallowing reagents ?

a) $C_6H_5NHNH_2$

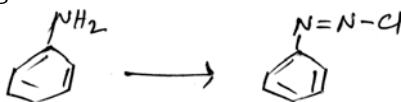b) $HCN + HCl$

c) $CHCl_3 + KOH$

d) $LiAlH_4$.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. What is Huckel's rule of Aromaticity ? What is the reason behind the aromaticity of pyrrole ? $1\frac{1}{2} + 3\frac{1}{2}$

3. a) Why is aniline less basic than aliphatic amines ?

b) Write the reagents and the mechanism involved in the following reaction : $2 + (1 + 2)$

4. Explain any *two* of the following : $2 \times 2\frac{1}{2}$

a) Pyrrole is less basic than pyridine.

b) Epoxides are not considered as heterocyclic compound

c) Electrophilic substitution is preferred at -2 position in comparison to – 3 position in furan.

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5. "Although chlorine acts as a deactivator, chlorobenzene acts as an ortho-paradirector" Explain. 5

6. Identify the structures : 5 × 1

a)

b)

c)

d)

e)
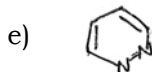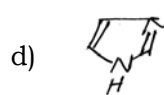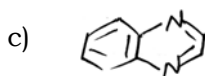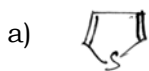
GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. What do you mean by heterocyclic structure ? Write down the structure of naphthalene and anthracene. Describe the aromatic character of anthracine. Write down the reduction, sulphonation and nitration reaction of anthracene. Describe the Howarth synthesis of anthoracene. Write down the name of the heterocyclic rings present in nucleic acid.

$$1 + 1 + 1^1/_2 + 6 + 4 + 1^1/_2$$

8. a) Explain the stepwise mechanism involved in nitration of benzene.

    b) Briefly discuss the mechanism involved in Friedel Craft Acylation of Bengene.

    c) Why are the functional groups – WH_2, – OH ortho-para-orienting whereas functional groups like – NO_2, – CHO are meta-orienting ?

    d) Write five reactions of phenol. 3 + 3 + 4 + 5

9. Briefly describe i) Sandmeyer reaction, ii) Gatterman reaction and iii) Schiemann reaction of diazonium compounds. Write short note on hydrazines. What do you mean by leaving group ? How is Arenium ion formed during electrophilic aromatic substitution ? 9 + 3 + 1 + 2

10. a) Classify Carbohydrates with examples.

    b) Sucrose is a non-reducing sugar. Explain with structure.

    c) Write the chemical structure of cellulose and lactose.

    d) Write the structures of amylose and amylopectin and point out their differences.

    e) What do you understand by "Glycon" and "Aglycon" ?

    6 + 2 + 2 + 3 + 2

11. a) What is nucleophilic substitution reaction ?

    b) Differentiate between SN, and SN_2 reaction.

    c) Explain Mutarotation with example.

    d) Discuss about the nomenclature of fused ring heterocyclic systems.   2 + 3 + 5 + 5