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Total No. of Questions : 10]

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PHM–1.2.4

PHARMACEUTICAL CHEMISTRY–III

(Organic Chemistry)

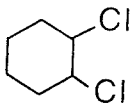
(B.Pharmacy, 2nd Semester, 2123)

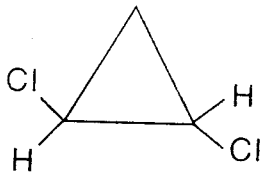
Time : 3 Hours Maximum Marks : 80

Note :– This paper consists of Three Sections. Section A is compulsory. Attempt any *Four* questions from Section B and any *Three* questions from Section C.

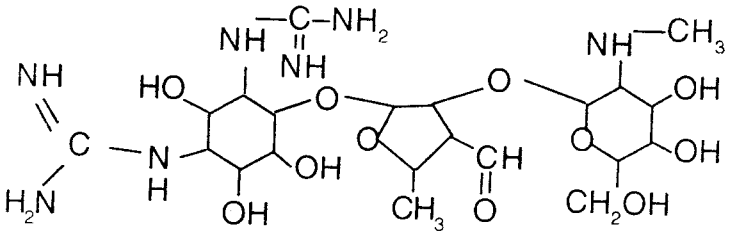
Section–A Marks : 2 Each

1. (a) Examine the following compounds for planes of symmetry and predict which of them are optically active.

(i) 

(ii) 

(b) The structure of the antibiotic streptomycin is shown below. Identify the asymmetric carbon atom/atoms in this compound :



(c) A solution contains 60% (+) lactic acid and 40% (–) lactic acid. Does this solution rotate the plane of planepolarized light ?

(d) List two major differences between diastereomers and enantiomers.

(e) When methane is treated with Cl_2 in the presence of UV light, small amounts of ethane and chlorinated ethanes are also formed. Explain.

(f) Give the mechanism of addition of Bromine to ethylene.

(g) How do you explain the acidic nature of C—H bond in acetylene ?

(h) How can ethyl bromide be converted into propanoic acid ?

(i) How will you obtain ethyl alcohol from methyl alcohol ?

(j) Write a note on aldol condensation.

(k) Which is the stronger acid—Formic acid or Propionic acid ? Why ?

(l) Name a chemical test or single chemical reagent which can be used to distinguish between methylamine and diethylamine.

(m) Write a note on Baeyer's strain theory.

(n) What happens when $C_{14}H_{10}$ is heated with $Na_2Cr_2O_7$ and H_2SO_4 ?

(o) Give the mechanism of bromination of benzene.

Section–B

Marks : 5 Each

2. (a) Predict the relative basicity of methyl fluoride (CH_3F), methyl alcohol (CH_3OH) and methyl amine (CH_3NH_2).

(b) Which is the stronger acid of each pair :

(i) H_3O^+ or H_2O

(ii) NH_4^+ or NH_3

(iii) H_2S or HS^-

(iv) H_2O or OH^-

(v) What relationship is there between charge and acidity ? $2\frac{1}{2}, 2\frac{1}{2}$

3. The concentration of Cholesterol dissolved in chloroform is 6.15 g per 100 ml of solution.

(a) A portion of this solution in a 5 cm polarimeter tube causes an observed rotation of $-102°$. Calculate the specific rotation of Cholesterol.

(b) Predict the observed rotation if the same solution were placed in a 10 cm tube.

(c) Predict the observed rotation if 10 ml of the solution were diluted to 20 ml and placed in a 5 cm tube. 2,1,2

4 What is Diazotization ? What are the necessary conditions to bring about a diazotization reaction ? Give two reactions of diazonium chloride. 1,2,2

5. How are primary, secondary and tertiary aliphatic amines be separated from one another ?

6. How does acetic acid react with the following reagents ?

(a) $SOCl_2$

(b) Ag.NaOH

(c) P_2O_5

(d) $LiAlH_4$

(e) Cl_2/Red P

Section–C Marks : 10 Each

7. How will you convert :

   (a) Acetic acid into propionic acid

   (b) Propionic acid into acetic acid ? 5,5

8. (a) Discuss the mechanism of Aldol condensation.

   (b) By what tests can you distinguish between aldehydes and ketones ? 4,6

9. Give the following interconversions with the help of an example in each case :

   (a) Primary alcohol into Secondary alcohol

   (b) Secondary alcohol into Tertiary alcohol

   (c) Primary alcohol into Tertiary alcohol. 4,3,3

10. Draw and specify as R or S the enantiomers (if any) of :

    (a) 3-bromohexane

    (b) 3-chloro-3 methyl pentane

(c) 1, 2-dibromo-2-methyl butane

(d) 1, 3-dichloropentane

(e) 3-chloro-2, 2, 5-trimethyl hexane

(f) $CH_3CH_2CH_2CHDCl$