Total No. of printed pages = 7

BP 401 T

23/08/22

Roll No. of candidate | | | | | | | | | | |

2022

B.Pharm. 4th Semester End-Term Examination

PHARMACEUTICAL ORGANIC CHEMISTRY – III

Full Marks – 75 Time – Three hours

The figures in the margin indicate full marks for the questions.

1. Answer the following (MCQ) : (20 × 1 = 20)

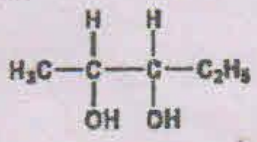
(i) What is the molecular formula for the alkane of smallest molecular weight which possesses a stereogenic center?

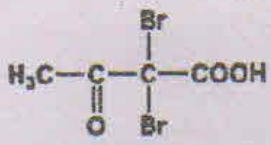
(a) C_4H_{10}
(b) C_6H_{14}
(c) C_5H_{12}
(d) C_7H_{16}

(ii) Ranitidine, the most common antacid drug possesses ———— heterocyclic ring.

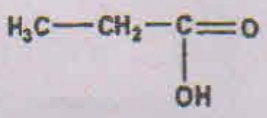
(a) Quinoline
(b) Thiophene
(c) Furan
(d) Pyrimidine

(iii) Identify the compound which displays optical activity in polarimeter.

(a) 

(b) 

(c) $H_3C\_CHOH\_CH_3$

(d) 

(iv) For being chiral compound, chemical compound should not possess following characteristics:

(a) Plane of symmetry

(b) Axis of symmetry

(c) Centre of symmetry

(d) All of the above

(v) Pyrrole is heated with ———— to open the ring and form succinaldehyde dioxime.

(a) Conc. Sulfuric acid

(b) Strong alkali with pyridine

(c) Hydrogen cyanide with HCl

(d) Ethanolic hydroxylamine hydrochloride

(vi) Which of the following statements is correct?

(a) Diastereomers are not mirror images of each other, but they are superimposable

(b) Enantiomers have chiral centre but they are not superimposable

(c) Diastereomers do not have chiral centre and hence no optical activity

(d) Enantiomers have optical activity because they have plane of symmetry

(vii) Which hetero atom(s) cart be seen in Acridine?

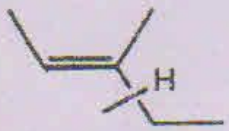
(a) Sulphur

(b) Oxygen

(c) Nitrogen

(d) Oxygen and sulphur

(viii) C_8H_{16} that can form cis-trans geometrical isomers and also has a chiral centre, is

(a) 

(b) 

(c) Both of these

(d) None of these

(ix) Which of the following conformation has highest stability?

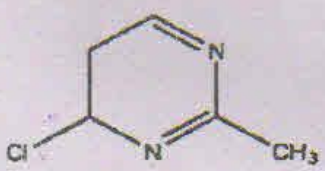
(a) Fully eclipsed

(b) Partially eclipsed

(c) Gauche

(d) Anti

(x) Select correct IUPAC name of the following structure:



(a) 4-Chloro-2-methyl-4,5-dihydro-pyrimidine

(b) 2-Methyl-4-chloro-4,5-dihydro-pyrimidine

(c) 6-Chloro-2-methyl-5,6-dihydro-pyridine

(d) 4-Chloro-2-methyl-4,5-dihydro-pyridine

(xi) A meso compound

(a) is an achiral molecule

(b) contains a plane of symmetry

(c) contains chiral carbon, but the compound is optically inactive

(d) is characterized by all of the above

(xii) Dakin reaction is useful for the synthesis of

(a) alkanes

(b) alkenes

(c) alcohols

(d) phenols

(xiii) Hexane and 3-Methylpentane are examples of

(a) enantiomers

(b) diastereomers

(c) cis-trans isomers

(d) chain isomers

(xiv) Piperidine is a

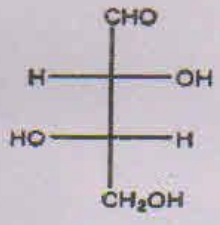
(a) Aromatic heterocyclic compound

(b) Aromatic carbocyclic compound

(c) Non-aromatic heterocyclic compound

(d) Non-aromatic carbocyclic compound

(xv) The mirror image of the following structure will be



(a) D enantiomer

(b) L enantiomer

(c) diastereomer

(d) a meso compound

(xvi) Pyridine has a delocalize Pi molecular orbital containing

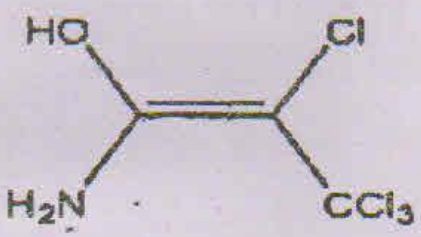
(a) 4 electrons

(b) 6 electrons

(c) 8 electrons

(d) 12 electrons

(xvii) Which configuration is shown by the following:



(a) Z

(b) E

(c) R

(d) S

(xviii) Alkenes show geometrical isomerism because of

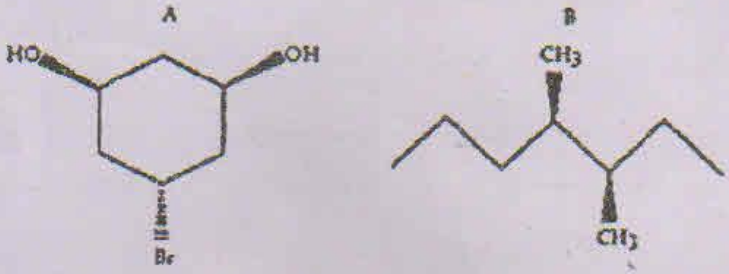
(a) Asymmetry

(b) Resonance

(c) Rotation around a single bond

(d) Restricted rotation around a double bond

(xix) Which of the following compound(s) is/are achiral?



(a) Both A and B

(b) Only A

(c) Only B

(d) Neither A nor B

(xx) The process of separation of racemic mixture into d- and 1- enantiomer is called

(a) revolution

(b) resolution

(c) inversion

(d) chiral pool

2. Answer any *seven* questions : (7×5=35)

(a) Write a note on the reactions and medicinal uses of Quinoline.

(b) Discuss the mechanism of Claisen Schmidt condensation. Why acidification at the end is required in this process? (3+2=5)

(c) Write short note on: (any-*two*) : (2 × 2.5 = 5)

(i) Atropisomerism

(ii) Boat and chair form of cyclohexane

(iii) Stereoselective reactions

(d) Compare the reactions of Pyrrole, Furan and Thiophene.

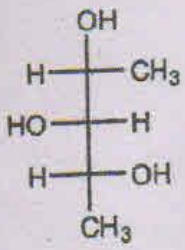
(e) What is Geometrical isomerism? Discuss the variety of this isomerism. (1+4=5)

(f) Classify heterocyclic compounds with two important examples from each category.

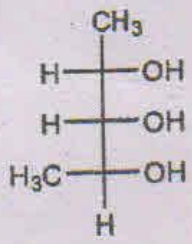
(g) Write the differences between Birch and Clemmention Reduction. Describe the methods of synthesis of Oxazoles. (2+3=5)

(h) Write a note on Asymmetric synthesis including some examples.

(i) For the following set of Fischer projections, answer each of the questions below:



A



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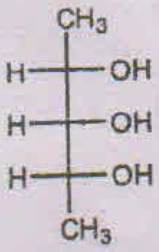

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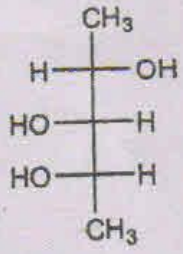

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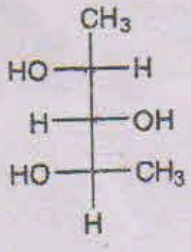


E

(i) Which are optically active?

(ii) Which pairs are identical?

(iii) Which pairs are diastereomers?

(iv) Which pair, when mixed as a 50/50 mixture, will not rotate plane polarize light (optically inactive)?

(v) Draw any stereoisomers of 2,3,4-pentanetriol as Fischer projections, which are not shown above.

(2 × 10 = 20)

3. Answer any *two* questions :

(a) Write on synthesis and reactions of any two compounds from the followings : (2 × 5 = 10)

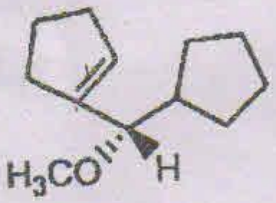
(i) Pyrimidine

(ii) Acridine

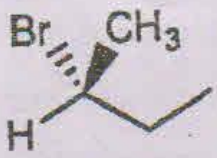
(iii) Indole

(b) Describe the absolute configuration (R/S) of the following structures: (5 × 2 = 10)

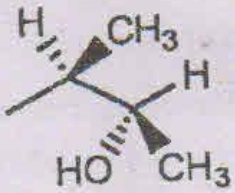
(i)



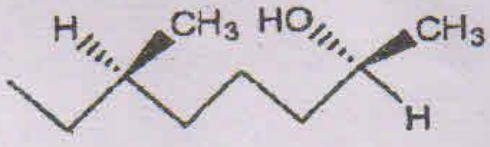
(ii)



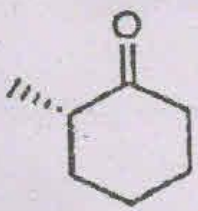
(iii)



(iv)



(v)



(c) (i) Draw and explain the conformational isomers of ethane. What is the role of steric hindrance in these isomers? (4.5+1.5)

(ii) Describe RS system of nomenclature of optical isomers. (4)
