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**BP 401 T**

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(GIMT & GIPS)  
Azara, Hatkhowapara,  
Guwahati - 781017

Roll No. of candidate

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**2019**

**B.Pharm. 4th Semester End-Term Examination**  
**PHARMACEUTICAL ORGANIC CHEMISTRY — III**  
**(Theory)**

**(New Regulation)**

**(w.e.f. 2017-2018)**

Full Marks – 75

Time – Three hours

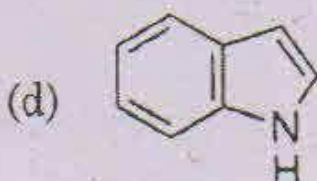
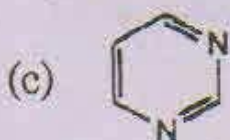
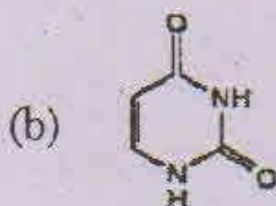
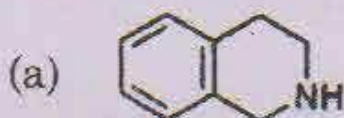
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The figures in the margin indicate full marks  
for the questions.

1. Answer the following : (MCQ) (20 × 1 = 20)
- (i) Mesomers are
- (a) Optically active
  - (b) Optically inactive
  - (c) May optically active or inactive
  - (d) None
- (ii) According to the sequence rule, select the correct order of priority
- (a) Br > Cl > O > N (b) Cl > Br > N > O
  - (c) N > O > Br > Cl (d) O > N > Br > Cl

[Turn over

- (iii) "Stereochemistry of the reactant completely determines the stereochemistry of the product without any other option" it indicates
- (a) Stereoselective reaction
  - (b) Stereospecific reaction
  - (c) Both stereoselective and stereospecific reaction
  - (d) None
- (iv) Which of the following compound is not aromatic?
- (a) Quinoline
  - (b) Pyrazole
  - (c) Pyrrole
  - (d) Tetrahydropyrrole
- (v) The 'N' atom in pyridine
- (a)  $sp^3$  hybridized
  - (b)  $sp^2$  hybridized
  - (c)  $sp$  hybridized
  - (d) may be  $sp^3$  or  $sp$  hybridized
- (vi) The chemical structure of pyrimidine is



(vii) The most stable form of cyclohexane is

(a) Haworth form

(b) Newman form

(c) Boat form

(d) Chair form

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(viii) The following order of aromaticity is correct

(a) Furan < pyrrole < thiophene < benzene

(b) Pyrrole < Thiophene < Furan < benzene

(c) Benzene < Thiophene < Pyrrole < Furan

(d) Benzene < Thiophene < Furan < Pyrrole

(ix) Woiff-Kishner Reduction reaction involves

(a) Aldehydes to carboxylic acid

(b) Ketones to carboxylic acid

(c) Aldehydes and ketones to alkanes

(d) None

(x) Oppenauer-oxidation reaction is carried out in presence of

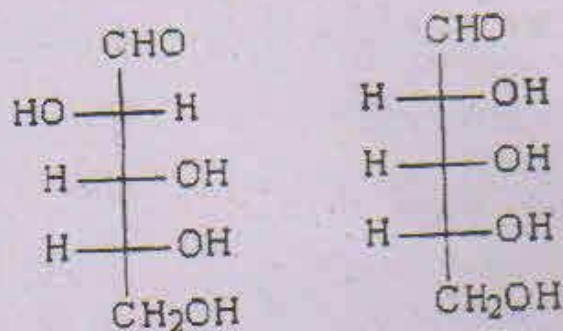
(a) Aluminium isopropoxide in excess NaOH

(b) Aluminium isopropoxide in excess HCl

(c) Aluminium isopropoxide in excess acetone

(d) Aluminium isopropoxide in excess  $ZnCl_2$

(xi) What is the relationship between the two structures?



- (a) Enantiomers
- (b) Diastereomers
- (c) Constitutional isomers
- (d) Mesomers

(xii) Enantiomers have the following property

- (a) Rotate ordinary light
- (b) Have same melting point
- (c) Are super-imposable mirror images
- (d) React with optically active molecules at the same rate

(xiii) "The higher priority groups are on opposite sides of the bond" indicates

- |              |              |
|--------------|--------------|
| (a) E isomer | (b) D isomer |
| (c) Z isomer | (d) L isomer |

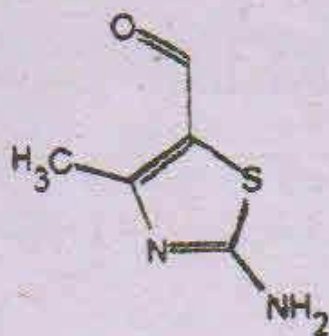
(xiv) The number of resonance structures for furan are

- |       |       |
|-------|-------|
| (a) 2 | (b) 8 |
| (c) 7 | (d) 5 |

(xv) One of the following is not a fused heterocyclic

- |                   |               |
|-------------------|---------------|
| (a) Benzimidazole | (b) Acridine  |
| (c) Indole        | (d) Imidazole |

- (xvi) Pyrrole on nitration with cold solution of nitric-acid in acetic anhydride yields  
 (a) 3-nitropyrrole (b) 2-nitropyrrole  
 (c) 5-nitropyrrole (d) 4-nitropyrrole
- (xvii) Pamaquine is an anti-malarial drug containing the following heterocyclic ring  
 (a) Benzimidazole (b) Quinoline  
 (c) Purine (d) Acridine
- (xviii) Caffeine is a derivative of  
 (a) Purine (b) Pyrazole  
 (c) Imidazole (d) Oxazole
- (xix) Which of the following is a not five membered heterocyclic ring?  
 (a) Imidazole (b) Triazole  
 (c) Oxazole (d) Pyridine
- (xx) The IUPAC name of the following compound is



- (a) 5-amino-3-methyl-1, 4-thiazole-2-carbaldehyde  
 (b) 5-amino-3-methyl-2, 4-thiazole-2-carbaldehyde  
 (c) 2-amino-4-methyl-1, 3-thiazole-5-carboxylic acid  
 (d) 2-amino-4-methyl-1, 3-thiazole-5-carbaldehyde

2. Short questions (Answer any seven) :

- (a) Define heterocyclic compounds. Classify them with examples. (1+4=5)
- (b) Write the methods of determination of configuration of geometrical isomers with examples. (5)
- (c) What are conformational isomers? Draw the conformational isomers of Ethane and *n*-Butane. (1+4=5)
- (d) Define stereospecific and stereoselective reactions. Discuss them with examples. (2+3=5)
- (e) Explain the RS system of nomenclature of optical isomers with suitable examples. (5)
- (f) Write a note on relative aromaticity, reactivity and basicity of pyrrole. (2+2+1=5)
- (g) Write the synthesis and chemical reactions of quinoline. (2+3=5)
- (h) Write the synthesis and of medicinal uses of purine. (5)
- (i) Discuss Birch reduction with mechanism. (5)

3. Long questions (Answer any two) :

- (a) Define optical isomers. Discuss optical isomerism with reference to Enantiomerism and diastereoisomerism. Write a note on racemic modification and resolution of racemic mixture. (1+4+5 = 10)

- (b) Write notes on : (5+5=10)
- (i) Beckmanns rearrangement reaction along with its mechanism.
  - (ii) Claisen-Schmidt condensation reaction along with its mechanism.
- (c) Discuss the synthesis, chemical reactions and medicinal uses of the following heterocyclic rings
- (i) Imidazole
  - (ii) Furan. (5+5=10)

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