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

**BP 301 T**

Roll No. of candidate

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**2019**

**B.Pharm. 3rd Semester End-Term Examination**

**PHARMACEUTICAL ORGANIC CHEMISTRY — II -  
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 questions: (20 × 1 = 20)
- (i) The Dow's process is used for the synthesis of:
- (a) Aniline
  - (b) Phenol
  - (c) Benzene
  - (d) Benzoic acid
- (ii) The carbon atoms in Benzene rings are
- (a) Sp<sup>2</sup>
  - (b) Sp<sup>3</sup>
  - (c) Sp
  - (d) None of these

[Turn over

- (iii) In Friedel-Craft acetylation of an aromatic ring, the role of Aluminium chloride is
- (a) Form  $\text{CH}_3\text{CO}$  ion
  - (b) Functions as Lewis base
  - (c) Chlorine the aromatic ring
  - (d) With draw electrons from the aromatic ring
- (iv) Acidity of phenols is increased by
- (a) Electron donating groups
  - (b) Electron withdrawing groups
  - (c) Both of these
  - (d) None of these
- (v) Secondary amines are more basic than tertiary amines in aqueous solution because of
- (a) Methyl groups
  - (b) Solvation
  - (c) Both (a) and (b)
  - (d) None of these
- (vi) Reaction of phenols with excess amount of formaldehyde yields
- (a) Teflon
  - (b) Polyethylene
  - (c) Nanotubes
  - (d) Bakelite

(vii) Benzene undergoes which of these types of reactions?

- (a) Nucleophilic substitution
- (b) Electropilic addition
- (c) Electrophilic substitution
- (d) Nucleophilic addtion

(viii) The presence of saturation/unsaturation in fatty acid is determined by

- (a) Reichert Meissl value
- (b) Saponification value
- (c) Ester value
- (d) None of these

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(ix) The theory that large polymethylene ring can become free from strain if all the ring carbons are not forced into one plane is:

- (a) Baeyer's strain theory
- (b) Coulson-Moffitt Model
- (c) Sachse Mohr's theory
- (d) None of theses

(x) The C-C-C bond angle in cyclopropane is closest to:

- (a)  $120^\circ$
- (b)  $109.5^\circ$
- (c)  $60^\circ$
- (d)  $90^\circ$

(xi) Shift of methyl groups in N,N-dialkylanilines occur by

- (a) Hinsberg reaction
- (b) Carbylamine reaction
- (c) Azocoupling reaction
- (d) Hofmann-Martius reaction

(xii) Find the odd one out

- (a) Malic acid
- (b) Benzoic acid
- (c) Picric acid
- (d) Galic acid

(xiii) Which of these is least basic in nature?

- (a) Aniline
- (b) Benzylamine
- (c) Acetanilide
- (d) P-nitro aniline

(xiv) The electrophile which is considered to be the active agent in the nitration of benzene is:

- (a)  $\text{NO}_2^-$
- (b)  $\text{NO}^+$
- (c)  $\text{NO}_2^+$
- (d)  $\text{HNO}_2^+$

(xv) Aniline reacts with nitrous acid at low temperature to give:

- (a) N-nitrosoamine
- (b) A nitrile
- (c) A diazonium salt
- (d) A nitrite salt

(xvi) The Acetyl value is used to determine:

- (a) Unsaturation
- (b) Acetone liberation
- (c) Acetic acid
- (d) Glycerol liberation

(xvii) Which of these is most acidic?

- (a) O-cresol
- (b) P-nitrophenol
- (c) P-cresol
- (d) P-chlorophenol

(xviii) Haworth synthesis is the process for synthesizing:

- (a) Benzene
- (b) Phenols
- (c) Aniline
- (d) Naphthalene

(xix) Which of these is aspirin?

- (a) Salicylic acid
- (b) Acetylsalicylic acid
- (c) Methyl salicylate
- (d) Acetobutyrylsalicylic acid

(xx) The Reimer-Tiemann reaction is used for the synthesis of:

- (a) Phenol
- (b) Benzaldehyde
- (c) Salicylaldehyde
- (d) Salicylic acid

2. Answer the following: (Any seven):  $(7 \times 5 = 35)$

(a) Write in detail about the acidity of phenols with reference to the effect of Electron withdrawing and donating groups.

(b) Write the mechanism of Nitration of Benzene.

(c) Draw the structures of the following compounds with their uses (Any two)

(i) DDT

(ii) Chloramine

(iii) BHC

$(2.5+2.5)$

(d) Write a note on the acidity of substituted benzoic acids.

- (e) Why do addition and electrophilic substitution reaction occur specifically at C-9 and C-10 positions of anthracene?
- (f) Why nitration of aniline yields meta-directed products? How can it be made para-directing? (2.5+2.5)
- (g) Why does benzene undergo electrophilic substitution reactions whereas alkenes undergo addition reaction?
- (h) Write the principle of (2.5+2.5)
- (i) Reichert Meissl value
- (ii) Saponification value
- (i) Write the reaction and mechanism of Kolbe's synthesis.
3. Answer the following: (Any two) (2 × 10)
- (a) Explain in detail the Baeyer's strain theory with its limitations and steps to overcome them. (4+3+3)
- (b) Write the synthesis of Naphthalene. Write a note on diazotisation reaction. (6+4)
- (c) Write a note on
- (i) Huckel's rules of aromaticity
- (ii) Theory of directive effects in case of monosubstituted benzene. (4+6)
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