

22/04/2021

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**BP 301 T**

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**2021**

**B.Pharm. 3<sup>rd</sup> Semester Regular-End-Term Examination**  
**PHARMACEUTICAL ORGANIC CHEMISTRY – II – Theory**  
**New Regulation (W.e.f. 2017 – 18)**

Full Marks – 75

Time – Three hours

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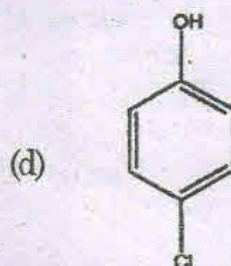
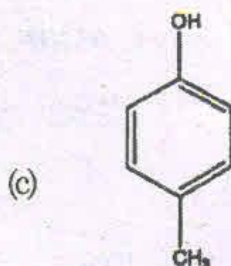
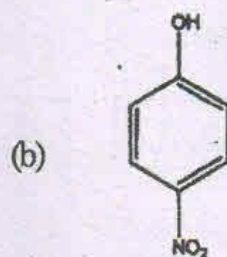
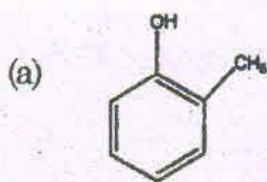
The figures in the margin indicate full marks for the questions.

1. Answer the following : (20 × 1 = 20)
- (i) Electron releasing group of phenol:
- (a) Stabilizes phenoxide ion and increases the acidity
  - (b) Destabilize the phenoxide ion and decrease the stability
  - (c) Stabilizes the phenoxide ion and decreases the acidity
  - (d) Destabilizes the phenoxide ion and increases the acidity
- (ii) Boiling point of phenols are higher than those of corresponding hydrocarbon and aryl halide because:
- (a) strong association of molecules by intermolecular hydrogen bond
  - (b) strong association of molecules by intramolecular hydrogen bond
  - (c) strong association of molecules by covalent bonds
  - (d) none of the above

[Turn over



(iii) Which of the following compounds is most acidic



(iv) Formation of an electrophile in the electrophilic substitution reaction of benzene occurs due to:

- (a) Homolytic cleavage of the Cl-Cl bond
- (b) Heterolytic cleavage of the Cl-Cl bond
- (c) Dissociation of Cl molecules
- (d) None of the above.

(v) The major drawbacks of the Friedel-Crafts alkylation of benzene are:

- (a) It is difficult to stop the reaction when one alkyl group has entered the ring.
- (b) The alkyl groups often tend to rearrange and give us an isomer.
- (c) The carbonium ions formed can undergo rearrangement before attacking the benzene ring.
- (d) All the above.

(vi) Rancidity of lipids containing food is due to

- (a) Hydrogenation of unsaturated fatty acids
- (b) Reduction of fatty acids
- (c) Oxidation of fatty acids
- (d) Dehydrogenation of unsaturated fatty acids

(vii) Aniline on diazotization ( $\text{HNO}_2/\text{HCl}$ ) gives:

- (a) Benzoylchloride
- (b) Benzyl Chloride
- (c) Benzene diazonium chloride
- (d) Benzoic acid







(xiii) Sodium phenoxide reacts with  $\text{CO}_2$  at  $125^\circ\text{C}$  under 5atm pressure to give salicylic acid. This reaction is called

- (a) Kolbe's Reaction (b) Perkin Reaction  
(c) Wurtz Reaction (d) HVZ reaction

(xiv) Phenol is acidic because of:

- (a) Resonance effect (b) Electromeric effect  
(c) Inductive effect (d) Peroxide effect

(xv) Amino and Hydroxyl groups on aniline are strong

- (a) Meta directing groups  
(b) Ortho directing groups only  
(c) Ortho/para directing groups  
(d) Para directing groups only

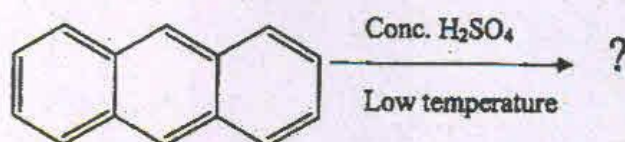
(xvi) Which of the following cycloalkanes is most reactive

- (a) cyclopropane (b) cyclohexane  
(c) cyclobutane (d) cycloheptane

(xvii) Liquid oils can be converted to solid fats by

- (a) Hydrogenation (b) Saponification  
(c) Hydrolysis (d) Oxidation of double bonds

(xviii) Complete the reaction:



- (a) Anthraquinone (b) 2-Anthracenesulphonic Acid  
(c) 1-Anthracenesulphonic Acid (d) None of the above

(xix) The predominating product of Naphthalene is :

- (a) Alpha product (b) Beta product  
(c) Both alpha and beta product (d) None of the above



(xx) Saponification of a fat

- (a) Results in formation of insoluble soaps
- (b) Produces glycerol and soaps
- (c) Is used in production of detergents
- (d) Is used in production of lactic acids

2. Answer any SEVEN from the following :

(7 × 5 = 35)

- (a) Explain the aromaticity of benzene. What are the effects of ortho-para and meta directing groups on the benzene ring.
- (b) Why do cyclopropane undergoes ring opening reactions? Give two such ring opening reactions.
- (c) Give two methods of preparation of aromatic amines. Give the important physical properties of aromatic amines.
- (d) Explain why para-nitro phenol is more acidic than phenol. Give two methods of preparation of phenol.
- (e) What are aromatic acids? Give the general classification with examples. Write about the effects of substituents upon the acidity of benzoic acid.
- (f) What are fats and oils? Give the basic differences between fats and oils.
- (g) Write a short note on anyone of the following:
  - (i) Salicylic acid
  - (ii) Benzoic acid
- (h) What are polynuclear hydrocarbons? Which is the predominant product of naphthalene and why? Give two important chemical reactions of naphthalene.
- (i) Explain the basicity of aromatic amines. What are the effects of different substituents on the basicity of aromatic amines?
- (j) Give the mechanism of the characteristic electrophilic substitution reaction of benzene.



3. Answer any TWO from the following :

(2 × 10 = 20)

- (a) Explain the Bayer strain theory of Cycloalkanes. What were its limitations? What was proposed to overcome the limitation of the Bayer Strain theory? Which is the stable conformation of cyclohexane and why?
- (b) Write short notes on :
- (i) Kolbe's reaction
  - (ii) Reimer tiemann reaction
  - (iii) Iodine number
  - (iv) Acid value
  - (v) Saponification value
- (c) Explain the stability of Benzene in the terms of energy theory. Give three important chemical reactions of benzene.
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