

Total No. of printed pages = 6

**BP 301 T**

Roll No. of candidate

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2023

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**B.Pharm. 3<sup>rd</sup> Semester End-Term Examination**

**PHARMACEUTICAL ORGANIC CHEMISTRY – II (Theory)**

Full Marks – 75

Time – Three hours

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

- I. Multiple Choice Questions (MCQ/ Answer all questions) : (20 × 1 = 20)
1. Phenol containing 5% water known as
    - (a) Acetic acid
    - (b) Carboic acid
    - (c) Sodium phenoxide
    - (d) None of the above
  2. Meta directing groups ————— a ring towards electrophilic substitution reaction
    - (a) Activate
    - (b) Deactivate
    - (c) No effect
    - (d) None of these
  3. Isopropylbenzene is also known as
    - (a) Cumene
    - (b) Toluene
    - (c) Anthracene
    - (d) None of these

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4. The basicity of amines can be increased by
- (a)  $-\text{NO}_2$
  - (b)  $-\text{COOH}$
  - (c)  $-\text{CH}_3$
  - (d)  $-\text{Br}$
5. The relative acid strength of p-nitrophenol, o-nitrophenol, p-cresol and phenol is
- (a) p-nitrophenol, o-nitrophenol, p-cresol, phenol
  - (b) phenol, p-nitrophenol, o-nitrophenol, p-cresol
  - (c) o-nitrophenol, p-cresol, phenol, p-nitrophenol
  - (d) p-cresol, phenol, p-nitrophenol, o-nitrophenol
6. Compared to benzene, nitration of toluene takes place at
- (a) Same rate
  - (b) Faster rate
  - (c) Slower rate
  - (d) Can not predict
7. When phenol treated with neutral  $\text{FeCl}_3$  solution, it develops
- (a) Purple colour
  - (b) Yellow colour
  - (c) Green colour
  - (d) Nothing happens
8. Carbylamine reaction is shown by
- (a)  $1^\circ$  aromatic amines
  - (b)  $2^\circ$  aromatic amines
  - (c)  $3^\circ$  aromatic amines
  - (d) None of these

9. Anisole is formed when phenol is treated with
- (a)  $CH_3I/NaOH$
  - (b)  $CH_3CH_2I/NaOH$
  - (c)  $CH_3Cl_2/NaOH$
  - (d) Acetic Anhydride
10. Anthracene gives \_\_\_\_\_ with conc.  $H_2SO_4$  at low temperature
- (a) Anthracene-1-sulfonic acid
  - (b) Anthracene-2-sulfonic acid
  - (c) Anthracene-9-sulfonic acid
  - (d) None of these
11. Naphthalene undergoes oxidation with  $Na_2Cr_2O_7/H_2SO_4$  to form
- (a) Phthalic acid
  - (b) Benzoic acid
  - (c) Teralin
  - (d) Phenylacetic acid
12. Benzonitrile is
- (a) Phenyl cyanide
  - (b) Phenyl hydrazine
  - (c) Thiophenol
  - (d) None of these
13. Benzoic acid undergoes reduction with \_\_\_\_\_ to form Benzyl alcohol
- (a) Pt
  - (b) Ni
  - (c)  $LiAlH_4$
  - (d) None of these

14. Electron withdrawing groups —————the acidity of benzoic acid
- (a) Increases
  - (b) Decreases
  - (c) No effect
  - (d) None of these
15. Phenol when treated with conc.  $\text{HNO}_3$  it gives
- (a) o- Nitrophenol
  - (b) p-Nitrophenol
  - (c) m-Nitrophenol
  - (d) 2,4,6- Trinitrophenol
16. Aniline on oxidation with pot, Dichromate gives
- (a) P-benzoquinone
  - (b) Nitrosoamine
  - (c) Carbylamine
  - (d) None of these
17. Resonance energy of naphthalene is
- (a) 72 Kcal/mole
  - (b) 61 Kcal/mole
  - (c) 36 Kcal/mole
  - (d) None of these
18. Soaps are Na or K salt of —————
- (a) Long chain of fatty acids
  - (b) Carbohydrate
  - (c) Protein
  - (d) None of these
19. Friedal craft acylation of anthracene gives
- (a) 9-acetylanthracene
  - (b) 1-acetylanthracene
  - (c) 2-acetylanthracene
  - (d) None of these

20. o-Hydroxybenzoic acid is

- (a) Anthranilic acid
- (b) Salicylic acid
- (c) phthalic acid
- (d) Toluic acid

II. Long answers (Answer two out of three) : (2 × 10 = 20)

21. How aniline is manufactured? What happens when aniline reacts with hydrochloric acid, alkyl halide, nitrous acid and benzene sulfonyl chloride. Write down the uses of aniline. (3+4+3)

22. Discuss the reaction mechanism involved in the following chemical reaction (5+5)

- (a) Reimer-Tiemann reaction
- (b) Kolbe reaction

23. Write down the methods of preparation of benzene. Explain any one electrophilic substitution reaction of benzene with mechanism. (4+6)

III. Short answers (Answer seven out of nine) (7 × 5 = 35)

24. Write down the Haworth synthesis of phenanthrene. What are the uses of phenanthrene

25. Define Acid value, saponification value and iodine value (2+2+1 = 5)

26. Write a note on aromaticity with suitable examples.

27. Describe the basicity of amines. Explain the effect of substitution on basicity of amines. Compare the basicity of aromatic amines and aliphatic amines.

28. Discuss the structures and uses of DDT and BHC.

29. Explain the theory of directive effect of substituents with examples.

30. Explain why  $\alpha$ -product predominates in the monosubstitution of naphthalene.

31. Discuss the Baeyer strain theory of cycloalkane.
  32. Discuss any five synthetic applications of aryl diazonium salt.
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