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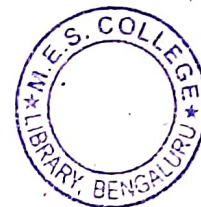
V Semester B.Sc. Degree Examination, March - 2021

CHEMISTRY

Organic Chemistry

(CBCS Scheme-2020-21 and Onwards)

Paper : V



Time : 3 Hours

Maximum Marks : 70

Instruction to Candidates:

- 1) The question paper has **Two** parts. Answer both the parts.
- 2) Draw diagrams and chemical equations wherever necessary.

PART - A**I. Answer any **Eight** of the following questions. Each question carries **Two** marks. (8×2=16)**

1. What are diastereomers? Give an example.
2. Write the geometrical isomers of an aldoxime.
3. How is ethylamine synthesis from Gabriel Phthalimide method?
4. Write the structure of Indole and quinoline.
5. What is TMS? Mention its use.
6. Sketch the graphical representation of UV spectrum of 1,3-butadiene.
7. Define Mutarotation.
8. What are terpenoids? Give an Example.
9. Give one medicinal use of
 - i) Morphine
 - ii) Cocaine.
10. What are mordant dyes?
11. Write any two principles of Green Chemistry.
12. What are antibiotics? Give an example.

[P.T.O.]



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PART - B

II. Answer any Nine of the following questions. Each question carries Six marks. ($9 \times 6 = 54$)

13. a) Distinguish between maleic acid and fumaric acid as cis and trans by
i) Cyclisation method.
ii) Melting point measurements. (4+2)
b) What is a racemic mixture?
14. a) Explain the Optical activity in tartaric acid. (4+2)
b) What are the limitations of biochemical method of resolution?
15. a) What is diazotization? Give chemical equation. (2+2+2)
b) Compare the basicity of aniline and methylamine.
c) Write the structure of R - lactic acid and S- Glyceraldehyde.
16. a) How are 1° , 2° and 3° amines distinguished by Hinsberg's test? Give chemical reactions. (4+2)
b) How is acetanilide prepared from aniline?
17. a) Explain the aromatic character of furan based on orbital structure and Huckel's rule. (4+2)
b) Give the preparation of thiophene from acetylene.
18. a) Give the general mechanism of electrophilic substitution on pyrrole. (4+2)
b) What are equivalent and nonequivalent protons.



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19. a) Compare the IR spectra of benzoic acid and methyl benzoate. (4+2)
b) What is bathochromic shift?
20. a) What is meant of shielding and deshielding effects? Explain. (4+2)
b) Mention the types of electronic transitions found in UV region.
21. a) How is glucose converted to fructose? (4+2)
b) Write Haworth structure of β -maltose.
22. a) Write the structure of Zingiberene. Establish the presence of conjugated double bonds in it by giving suitable chemical reaction? (4+2)
b) Give one use of
i) Camphor.
ii) Limonene.
23. a) Write the structure of nicotine. Give suitable chemical reactions to show the presence of pyridine in it.
b) Write the structure of ephedrine. (4+2)
24. a) Give the synthesis of paracetamol. (4+2)
b) Write the structure of censored.
25. a) How are drugs classified based on the treatment of diseases not due to infection? (4+2)
b) What are auxochrome? Give an example.
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V Semester B.Sc. Degree Examination, March - 2021

CHEMISTRY

Physical Chemistry

(CBCS - 2020 - 21 Onwards)

Paper : VI



Time : 3 Hours

Maximum Marks : 70

Instruction to Candidates:

- 1) The question paper has two parts. Answer both the parts.
- 2) Draw diagrams and chemical equations wherever necessary.

PART - AAnswer any **Eight** of the following questions. Each question carries **Two** marks. (8×2=16)

1. Give any two limitations of standard hydrogen electrode.
2. What is salt bridge? Mention its importance.
3. The limiting ionic conductance for Na⁺ ion is $4.929 \times 10^{-3} \text{ s m}^2 \text{ mol}^{-1}$. Calculate the ionic mobility of Na⁺ ion. (F=96500C).
4. What are concentration cells?
5. What are the advantages of potentiometric Titration?
6. What is half-wave potential? Mention its significance.
7. Calculate the number of vibrational degrees of freedom for a water molecule.
8. Carbon monoxide is microwave active but oxygen molecule is microwave inactive. Give reason.
9. Write claussius - Mossotti equation and indicate the terms involved in it.
10. Why excess of hydrochloric acid is added prior to H₂S gas during the detection of second group basic radicals in the inorganic qualitative analysis?
11. Explain the term piezoelectricity.
12. What is cyclic voltammogram?

[P.T.O.]



PART - B

Answer any **Nine** of the following questions. Each question carries **Six** marks. ($9 \times 6 = 54$)

13. a) Explain the method of determination of transport number of H^+ and Cl^- ions in hydrochloric acid by the moving boundary method.
b) Define the term molar conductance. (4+2)
14. a) How is emf of a cell experimentally determined by Poggendorff's compensation method?
b) The standard electrode potentials of zinc and copper electrodes in their salt solutions are -0.76v and $+0.34\text{v}$ respectively. Calculate emf of the Daniel cell. (4+2)
15. a) Derive Nernst equation for single electrode potential, thermodynamically.
b) Mention two limitations of Arrhenius theory of electrolytic dissociation. (4+2)
16. a) With a neat labelled diagram, explain construction and working of calomel electrode.
b) Define the term, standard electrode potential. (4+2)
17. a) State Kohlrausch's law. Calculate λ_{∞} for NH_4OH , if the molar conductances for $NaCl$, NH_4Cl and $NaOH$ at infinite dilution are 12.6×10^{-3} , 15.0×10^{-3} and $24.82 \times 10^{-3} \text{ sm}^2 \text{ mol}^{-1}$ respectively.
b) How do you set up a quinhydrone electrode? Represent it symbolically. (4+2)
18. a) Explain acid-base theory of indicators by taking phenolphthalein as an example.
b) Define: dipole moment. Mention its SI unit. (4+2)
19. a) Derive Henderson's equation for calculation of pH of an acid buffer.
b) What is Thomson effect? (4+2)
20. a) Derive the relationship between internuclear distance and moment of inertia for a rigid rotor diatomic molecule.
b) State Born - Oppenheimer approximation. (4+2)



21. a) Explain Raman Scattering and differentiate between stoke's and antistokes lines.
b) What are the selection rules for molecular transition between rotational and vibrational levels.
(4+2)
22. a) Calculate the Force constant and zero point energy for carbon monoxide if $\bar{\omega}_{osc} = 219 \text{ m}^{-1}$. Given: $h = 6.627 \times 10^{-34} \text{ Js}$, $C = 3 \times 10^8 \text{ m/s}$ and $\mu = 11.39 \times 10^{-28} \text{ kg}$.
b) Mention any two advantages of Raman Spectra over IR spectra.
(4+2)
23. a) Differentiate between paramagnetic and Ferromagnetic substances. Give one example for each type.
b) What is Seebeck effect?
(4+2)
24. a) Draw the current - potential curve for an electrochemical reaction taking place at dropping mercury electrode and explain the different types of currents.
b) Write Ilkovic equation and indicate the terms.
(4+2)
25. a) Name the different types of molecular spectra and mention the region of electromagnetic spectrum in which they appear.
b) Explain why only two absorption bands are observed in IR spectrum of Co_2 instead of Four.
(4+2)
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