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FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE  
Fifth Semester B.Sc Chemistry Degree Examination, November 2018  
CHE5B06 – Inorganic Chemistry III  
(2015 Admission onwards)

Max. Time: 3 hours

Max. Marks: 80

**Section A (One word)**

**Answer all questions. Each question carries 1 mark**

1. Presence of  $\text{NH}_4\text{Cl}$  in a saturated solution of  $\text{NH}_4\text{OH}$ , suppress the dissociation of  $\text{NH}_4\text{OH}$  due to -----.
2. The structure of boron nitride is similar to that of -----.
3. Strontium salts imparts ----- colour to the flame.
4. Iodine is sparingly soluble in water but dissolves in a solution of KI forming a deep coloured solution containing ----- ion.
5.  $\text{XeF}_2$  has ----- geometry.
6. Write the auto ionisation of liquid  $\text{SO}_2$ .
7. An example of a covalent polymer that displays metallic properties even though it contains no metal atom is -----.
8. The bacteria in sewage, causing disease to man and animals are -----.
9. Photochemical smog is caused by oxides of -----.
10. What is meant by MSW?

(10 x 1 = 10 Marks)

**Section B (Short answer)**

**Answer any ten questions. Each question carries 2 marks**

11. How oxalate ion is eliminated?
12. Distinguish between accuracy and precision.
13. Which has higher ionisation energy, B or Al? Why?
14. How is diborane converted to boron nitride?
15. Among Li and Be, which has higher first ionisation energy? Why?
16. ICl is more reactive than  $\text{I}_2$ . Why?
17. What are pseudohalogens? Give an examples.
18. P is able to form a pentahalide but N is not. Why?
19. Explain why the strong acid  $\text{HNO}_3$  behaves as a base in HF medium.
20. Alkali metals in liquid ammonia are coloured. Why?
21. How acid rain is formed? What are its consequences?
22. What is green house effect?

(10 x 2 = 20 Marks)

### Section C (Paragraph)

Answer any five questions. Each question carries 6 marks

23. What is co-precipitation? How does it affect gravimetric analysis?
24. What is borazine? How is it prepared? Why it is called inorganic benzene?
25. Discuss the following properties taking *carbon* family as example:
  - a) Ionization energy
  - b) Inert pair effect
  - c) Electron affinity
26. Explain the role of selenium in xerography.
27. Briefly explain the structure and applications of silicates.
28. How is  $IF_5$  obtained? What is its hybridisation and structure?
29. Describe any *four* reactions taking place in liquid  $SO_2$ .
30. Discuss briefly any *four* methods for the control of water pollution.

(5 x 6 = 30 Mark)

### Section D (Essay)

Answer any two questions. Each question carries 10 marks

31. What are errors? Write notes on the different types of errors in chemical analysis. How these errors are minimised?
32. a) Discuss the preparation, properties and uses of nitric acid.  
b) Outline the method of separation of noble gases by charcoal adsorption method.
33. Discuss briefly the preparation, properties and structure of  $S_2N_2$ ,  $S_4N_4$  and (SI) compounds.
34. a) Explain in detail the air pollution caused by the oxides of carbon, nitrogen & sulphur.  
b) Write a note on impacts of medical waste and their disposal.

(2 x 10 = 20 Mar)

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Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE  
Fifth Semester B.Sc Chemistry Degree Examination, November 2018  
CHE5B07 – Organic Chemistry II  
(2015 Admission onwards)

Max. Time: 3 hours

Max. Marks: 80

**Section A (one Word)**

Answer all the questions each question carries 1 Mark

1. The structure of furfural is .....
2. Nitrobenzene when reduced with stannous chloride.....is formed.
3. Pyridine when reacts with methyl bromide. the product formed is .....
4. Aniline when reacts with acetyl chloride .....is formed
5. The product formed on hydrolysis of benzoyl chloride is .....
6. When benzene diazonium chloride reacts with p-cresol, the product formed is .....
7. What product is formed when benzaldehyde condenses with acetone in presence of dil.NaOH?
8. The reduction product of benzoyl chloride with Pd/BaSO<sub>4</sub> is.....
9. As the number of carbon atom increases, solubility of alcohol.....
10. What is the structure of phenolphthalein?

(10 x 1 = 10 Marks)

**Section B(Short answer)**

Answer any 10 questions each question carries 2 Marks

11. What is chichibabin reaction?
12. How unsaturated acids are prepared from acetoacetic ester?
13. How ethylbenzene is prepared from acetophenone?
14. How diphenylsulphone is prepared from benzene sulphonic acid?
15. How sodium carboxylate is prepared from methyl ketone?
16. What is TNT? How is it prepared?
17. What is the action of aniline on ethylmethyl ketone in presence of a reducing agent?
18. What is Gattermann Koch reaction?
19. How urethane is prepared from urea?
20. What is the action HI on diethyl ether?
21. Account the acidity of nitroalkanes.
22. Write down the mechanism of Beckmann rearrangement.

(10 x 2 = 20 Marks)

### Section C (Paragraph)

Answer any five questions each questions carries 6 marks

23. Write down the electrophilic substitution reaction of furan.
24. Explain the Hinsberg's test to distinguish primary, secondary and tertiary amines.
25. Write down the preparation and reactions of oxalic acid.
26. Explain the synthetic application of Organo Lithium compound.
27. Write down the preparation and uses of sulpho drugs.
28. Write notes on estimation of urea.
29. Illustrate the mechanism of Aldol Condensation and Cannizzaro reactions.
30. What are the reduction product of nitrobenzene in various media?

(5 x 6 = 30 Marks)

### Section D (Essay)

Answer any two questions each question carries 10 marks

31. Discuss the reactions of acid chlorides and acid anhydrides.
32. Explain the effect of substituent on basicity of aliphatic and aromatic amines.
33. a) How ethylene oxide is prepared? (2 Marks)  
b) Write down the acid and base catalyzed ring opening reactions of ethylene oxide. (8 Marks)
34. Write notes on nucleophilic aromatic substitution, with mechanism.

(2 x 10 = 20 Marks)

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Reg. No:.....

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FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE  
Fifth Semester B.Sc Chemistry Degree Examination, November 2018  
CHE5B08 – Physical Chemistry II  
(2015 Admission onwards)

Max. Time: 3 hours

Max. Marks: 80

**SECTION A**

**Answer all questions (Each question carries 1 mark)**

1. A Chemical reaction where rate is independent of concentration of the reactants has order .....
2. In photosynthesis..... function as a photosensitizer
3. The process of adsorption is..... in nature.
4. ....sols generally show weak Tyndall effect.
5. Effective separation of lanthanides was made possible first by ..... chromatography.
6. A system consisting of one phase only is said to be.....system.
7. The number of normal modes of vibration for the CO<sub>2</sub> molecule is.....
8. A charged particle spinning about an axis act as a.....
9. A shift of absorption maximum to longer wavelength is called a .....
10. The number of vertical mirror planes that ammonia molecule has is .....

(10 x 1=10 marks)

**SECTION B (Short Answer)**

**Answer any ten questions (Each question carries 2 marks)**

11. Give the maximum number of phases that can exist in equilibrium in one component system.
12. Distinguish between order and molecularity of a reaction.
13. What is a proper rotation axis?
14. What are lyophilic and lyophobic colloids? Give examples.
15. State the Hardy-Schulze rule?
16. What are the transitions that are studied in Raman spectroscopy?
17. What is the information that one can obtain from a study of the microwave absorption of molecule?
18. What is an azeotropic mixture?
19. What is meant by Zeta potential?
20. Nitrogen gas does not absorb infrared radiation. Why?
21. Distinguish between Fluorescence and Photo fluorescence?
22. State and explain Grotthuss-Draper Law?

(10 x 2 =20 marks)

### SECTION C (Paragraph)

Answer any five questions. Each question carries 6 marks

23. Explain the silent features of Paper Chromatography?
24. Set up the group multiplication table for the  $C_{3v}$  point group?
25. Sketch the phase diagram of lead -silver system and discuss what is de silverisation of lead?
26. Calculate the rate constant of a reaction at 410 K having an activation energy of 150.6 KJ and a rate constant of  $2.52 \times 10^{-5} S^{-1}$  at 298 K?
27. Outline different methods for the preparation of colloids?
28. What is Freundlich isotherm? What is its application?
29. The rotational spectrum of HCl shows a series of lines separated by  $20.6 \text{ cm}^{-1}$ . Find the moment of inertia and the intermolecular distance?
30. Discuss the Transition state theory of reaction?

(5 x 6 = 30 marks)

### SECTION D (Essays)

Answer any two questions (Each question carries 10 marks)

31. Explain the principle of NMR Spectroscopy? What are its applications?
32. Sketch the phase diagram of Sulphur? Apply phase rule to different areas & curves, identify the triple points?
33. Discuss in detail the Collision theory of reaction rates?
34. (a) Discuss the significance of Jablonski diagram? (b) Derive Langmuir adsorption Isotherm

(2 x 10 = 20 marks)

## FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Fifth Semester B.Sc Chemistry (Open Course) Degree Examination, November 2018

## CHE5D02 – Chemistry in Daily Life

(2015 Admission onwards)

Max. Time: 2 hours

Max. Marks: 40

## Section A (One Word)

*Answer all questions. Each question carries 1 mark*

1. .... is an example of mordent dye.
2. .... is an example of antiseptic.
3. .... is a common adulterant in vegetable oils.
4. .... is a polymer used for making bullet proof materials?
5. Natural gas mainly contains .....
6. .... is an example of non-degradable pesticide.
7. The chemical name of the main ingredient used in hair dye is.....
8. .... is an example of a thermosetting plastic.
9. The chemical compound used for the artificial taste enhancer is .....
10. .... is an example of a synthetic rubber.

(10 x 1 = 10 Marks)

## Section B (Short answer)

*Answer any five questions Each question carries 2 marks*

11. What is meant by Vat dye?
12. Differentiate between pharmacodynamics and pharmacokinetics.
13. Explain bio-degradable polymers with examples.
14. What is meant by vulcanisation?
15. Explain chemical composition and application of sunscreen creams.
16. Artificial sweeteners can be used for diabetic persons. Explain the statement.
17. What is meant by Octane number?

(5 x 2 = 10 Marks)

**Section C (Paragraph)**

*Answer any two questions. Each question carries 5 marks*

18. Explain tranquilizers, antidepressants and antibiotics with examples.
19. Explain the significance and applications of antioxidants, food preservatives and commonly used food colours with examples.
20. Explain classification and cleaning action of detergents.

**(2 x 5 = 10 Marks)**

**Section D (Essay)**

*Answer any one question. Each question carries 10marks*

21. a) Uncontrolled usage of pesticides causes adverse impacts on environment. Explain the statement (5 marks)  
b) Explain the classification of coal based on carbon content and its fractional distillation products. (5 marks)
22. a) The potential uses of nano-materials are significant in computers, sensors, textiles and other sectors. Establish the statement with examples. (6 marks)  
b) Discuss applications of polystyrene, PMMA, terylene, and teflon. (4 marks)

**(1 x 10 = 10 Marks)**