

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Fifth Semester B.Sc Chemistry Degree Examination, November 2025

BCH5B06- Inorganic Chemistry III

(2022 Admission onwards)

Time: 2 hours

Max. Marks : 60

SECTION A

All questions can be attended. Each question carries 2 marks

1. What is coprecipitation? How can it be minimized?
2. What is meant by calcination?
3. Interhalogen compounds are more reactive than halogen. Explain.
4. Name an Interhalogen that has T-shaped structure. Explain how the structure is attained.
5. Draw the shape of XeO_3 molecule.
6. Mention the important uses of Helium.
7. What is polythiazyl? How it is prepared?
8. What is meant by common ion effect?
9. Name and formulate two ores of Cu.
10. What is meant by thermal pollution?
11. What is smog? Name two types of smog
12. Distinguish between the terms hazardous waste and non-hazardous waste

(Ceiling 20 Marks)

SECTION B

All questions can be attended. Each question carries 5 marks

13. Discuss the significance and applications of Ellingham diagram.
14. Describe how solubility product and common ion effect are applied in qualitative inorganic analysis.
15. What are Interhalogen compounds? Give examples. Discuss the structure of ClF_3 and IF_7 .
16. Explain the structure and reactivity of xenon fluorides.
17. Discuss various water quality parameters – DO, BOD, COD.
18. Explain the term greenhouse effect? What are the greenhouse gases?
19. Discuss the adverse effect and the methods for the disposal of biomedical wastes?

(Ceiling 30 Marks)

SECTION C

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

20. Discuss the metallurgical extraction of Titanium
21. What are silicones? How are they classified? Mention the applications of each class.

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

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE
Fifth Semester B.Sc Chemistry Degree Examination, November 2025

BCH5B07- Organic Chemistry II

(2022 Admission onwards)

Time: 2 hours

Max. Marks : 60

SECTION A

All questions can be attended. Each question carries 2 marks

- 1) Write a method for the preparation of fluorescein.
- 2) How can we convert phenol to salicylaldehyde?
- 3) Explain the advantages of using PCC as an oxidising agent.
- 4) What are the structural advantages of crown ethers as PTC?
- 5) Identify the product on reaction of isopropylmagnesium chloride with water.
- 6) What are the tests to distinguish between aldehydes and ketones?
- 7) Describe the formation of acetals and hemiacetals.
- 8) Draw the structure of citric and tartaric acids.
- 9) Give reasonable explanation for the acidity of benzene sulphonic acids.
- 10) Explain the importance of Gabriel phthalimide synthesis.
- 11) Write the steps involved in Curtius rearrangement.
- 12) Describe a method for the one step conversion of cyclopentanone to corresponding lactone.

(Ceiling 20 Marks)

SECTION B

All questions can be attended. Each question carries 5 marks

13. Explain the chemistry of Liebermann's nitroso reaction.
14. Give reasonable explanation for the low reactivity of aryl halides towards nucleophilic substitution.
15. Identify the reaction and elucidate mechanism when ethyl methyl ketone is treated with sodium hypoiodite.
16. Identify the steps for the conversion of acetic acid to propionic acid.
17. Azobenzene and azoxybenzene are generated as reduction product of nitrobenzene. Justify.
18. Describe one method for the synthesis of methyl orange.
19. Explain a method for the conversion of cyclohexanone to caprolactam with an emphasis to mechanism.

(Ceiling 30 Marks)

SECTION C

Answer any one question. Each question carries 10 marks

20. a) Write a mechanism for the electrophilic aromatic substitution of phenol.
b) Explain the chemistry of Victor Meyer's test. [5 + 5]
21. a) Describe the mechanism for aldol condensation of acetone and identify the product.
b) Write any three different synthetic applications of ethylacetoacetate. [4 + 6]

(1 x 10 = 10 Marks)

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Fifth Semester B.Sc Chemistry Degree Examination, November 2025

BCH5B08- Physical Chemistry II

(2022 Admission onwards)

Time: 2 hours

Max. Marks : 60

SECTION A**All questions can be attended. Each question carries 2 marks**

1. Define quantum yield.
2. Differentiate between parallel and opposing reactions.
3. Write down Arrhenius Equation and explain the terms. Mention the significance Arrhenius parameters.
4. The rate constant of a second order reaction is $7.0 \times 10^{-5} \text{ dm}^3 \text{ mol}^{-1} \text{ s}^{-1}$ at 30°C and $5.0 \times 10^{-4} \text{ dm}^3 \text{ mol}^{-1} \text{ s}^{-1}$ at 45°C . Calculate the activation energy.
5. Show that Langmuir isotherm follows first order at low gas pressure and zero order kinetics at high gas pressure.
6. State laws of photochemistry.
7. Write down BET equation and explain the terms.
8. Distinguish between internal conversion and inter system crossing.
9. Differentiate between deliquescence and efflorescence.
10. What is mutual exclusion principle in Raman spectroscopy?
11. Explain Born- Oppenheimer approximation.
12. Sketch the NMR spectra of dimethyl ether.

(Ceiling 20 Marks)**SECTION B****All questions can be attended. Each question carries 5 marks**

13. Derive the rate constant for a first order reactions. Obtain the expression for half-life period.
14. Discuss any two methods used to determine the order of a reaction.
15. Explain the salient features of enzyme catalysed reactions.
16. Derive Gibb's phase rule.
17. What is meant by anharmonicity? Discuss the origin of overtones in anharmonic oscillator.
18. Discuss how Frank-Condon principle operates in molecules leading to a continuum in absorption spectra.
19. What is meant by chemical shift? How is it expressed in NMR spectroscopy?

(Ceiling 30 Marks)

SECTION C

Answer any one question. Each question carries 10 marks

20. Derive Nernst distribution law. Discuss its applications.
21. (a) Derive Beer- Lambert's law. Mention its applications and limitations. (8 Marks)
- (b) Explain why carbon dioxide (CO_2) shows strong fundamental infrared absorption bands at approximately 2349 cm^{-1} and 667 cm^{-1} . (2 Marks)

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE
Fifth Semester B.Sc Chemistry Degree Examination, November 2025
(Open Course)

BCH5D02- Chemistry in Daily life

(2022 Admission onwards)

Time: 2 hours

Max. Marks : 60

Section A (Short Answers)

(Answer questions up to 20 marks. Each question carries 2 marks)

1. What are Natural polymers? Give one example
2. What is meant by biodegradable polymers? Give one example?
3. Name the monomers of nylon 66 and nylon 6.
4. Define octane number.
5. Differentiate between pharmacodynamics and pharmacokinetics.
6. What are common adulterants found in chilly powder, vegetable oils and milk?
7. What is meant by NPK Value?
8. What are herbicides? Give one Example
9. What is meant by TFM values of soap? Which TFM value soap is recommended for oily skin
10. What are the ingredients of shaving cream?
11. What are the compositions of toothpaste?
12. What is meant by generic name of drugs? Give one example.

[Ceiling of marks: 20]

Section B (Paragraph)

(Answer questions up to 30 marks. Each question carries 5 marks)

13. Explain different plastic identification codes (any five)
14. What are pesticides? Define different pesticides with one example each.
15. Discuss harmful effects of cosmetics.
16. Explain Endosulphan disaster in Kerala.
17. Write the ingredients of Hair dye, Face Powder, Cold creams
18. Explain the classification of fuels with one example. Mention the characteristics of a good fuel.
19. What are food additives? Explain different food additives and their functions with one example each.

[Ceiling of marks: 30]

Section C (Essay)

(Answer any one. Each question carries 10 marks)

20. Explain different types of Vitamins their functions and deficiency diseases
21. a) What are Vaccines? Discuss the role of Vaccine in public health. Explain how Antivaccine argument effect public health (5 marks)
- b) Explain the following with one example each
- i) Antipyretics
 - ii) Tranquilizers (5 marks)
 - iii) Psychedelic drugs.

[1 X 10 = 10]