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1B5N24162 (Pages : 2) Reg. No:.....
Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Fifth Semester B.Sc Chemistry Degree Examination, November 2024

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 post precipitation?
2. How is borate in a mixture is eliminated?
3. What is approximate composition of Bronze?
4. What is rutile?
5. Draw the structure of BrF_3
6. Explain hybridisation of I in IF_7
7. Why are noble gases unreactive?
8. Complete the following Equations.
   a) $XeF_2+I_2\rightarrow$ b) $XeF_2+NO\rightarrow$
9. What are orthosilicate? Give examples.
10. Write any sources of thermal pollution?
11. Write notes on BOD?
12. What is Wildlife Protection Act?

(Ceiling 20 Marks)

SECTION B

All questions can be attended. Each question carries 5 marks

13. What is meant by coprecipitation? How it can be minimised?
14. What are the different types of refining methods used in Metallurgy? Explain Monds process refining of Ni?
15. a) What are interhalogen compounds? Give two examples.
    b) Explain the product obtained when molten Iodine trichloride is electroysed?
16. Discuss the structure and bonding in $XeOF_4$and XeO_2F_2
17. Write a note on Ellingham diagrams.
18. a) What is acid rain? Explain
    b) Discuss the effect of Freons on Environment?
19. Explain rainwater harvesting?

(Ceiling 30 Marks)

SECTION C

Answer any one question. Each question carries 10 marks.

20. Explain the sources , effects and consequences of

    (i)thermal pollution (ii)radioactive pollution.

21. Give the method of preparation, properties and uses of silicones?

(1x10 = 10 Marks)

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FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Fifth Semester B.Sc Chemistry Degree Examination, November 2024

BCH5B07 - Organic Chemistry II

(2022 Admission onwards)

Time: 2 hours Max. Marks : 60

SECTION A

All questions can be attended. Each questions carries 2 marks

1. What is benzoin condensation?
2. Give the structure of Phenolphthalein and Fluorescein?
3. What is Houben -Hoesch reaction?
4. What is PCC? Name the molecule formed when butan-1-ol is treated with PCC?
5. Convert ethyl alcohol into diethyl ether?
6. What are Frankland reagents? Give a method for its preparation?
7. Convert Acetyl chloride to acetaldehyde?
8. Comprae the acidity of p-methoxy benzoic acid and p-nitrobenzoicacid? Justify your answer?
9. What is tosylation reaction?
10. Explain the basicity of guanidine?
11. What is Schimidt reaction?
12. Illustrate trans-esterification?

(Ceiling 20 Marks)

SECTION B

All questions can be attended. Each questions carries 5 marks

13. Explain the preparation and synthetic applications of Grignard reagent.
14. Explain Ziesel's method for estimation of methoxy group?
15. What is Wittig reaction? What is its synthetic use?
16. How will you bring about the following conversion

    Acetic acid →Propanoic acid

    Propanoic acid→Acetic acid
17. Explain Hofmann's elimination and stereochemistry with example?
18. Explain Lucas test and Victor Meyer's test.
19. How will you prepare acetic acid and succinic acid from Acetoacetic ester?

(Ceiling 30 Marks)

SECTION C

Answer any one question. Each question carries 10 marks

20. Explain following reactions with mechanism

a. Reimer-Tiemann reaction

b. Haloform reaction

c. Perkin reaction

d. Cannizarro reaction

21. (a)How Benzene diazonium chloride prepared? How are following compounds prepared from this

i)Phenol ii)Nitrobenzene iii)Methylorange (6)

b)What is Reformatsky reaction? How citric acid prepared by Reformatsky reaction? (4)

(1x10=10marks)

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FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Fifth Semester B.Sc Chemistry Degree Examination, November 2024

BCH5B08 - Physical Chemistry II

(2022 Admission onwards)

Time: 2 hours Max. Marks : 60

Section A (Short answers)
All questions can be attended. Each question carries 2 marks

1. What is steady state approximation?
2. Write Erying equation and explain the terms.
3. Draw the energy profile diagram of an endothermic and exothermic reaction.
4. Differentiate between homogeneous and heterogeneous catalysis. Give examples.
5. What is Michaelis constant? What is its significance?
6. What is meant by congruent melting point?
7. Define lower CST? Give two examples for systems with lower CST.
8. Explain triple point of water.
9. State rule of mutual exclusion. Give an example.
10. Explain chemical shift in NMR spectroscopy.
11. What are chromophores and auxochromes?
12. Differentiate between physical and chemical adsorption.

[Ceiling of marks: 20]

Section B (Paragraph)
All questions can be attended. Each question carries 5 marks

13. Explain Arrhenius theory of reaction rate. What is the significance of Arrhenius parameters?
14. What are the salient features of collision theory? Derive rate equation for reactions involving bimolecular collision.
15. Explain quantum theory of NMR spectroscopy.
16. Derive Nernst distribution law. Discuss its applications.
17. Explain Pattinson's process using the phase diagram of Pb-Ag system.
18. Derive Freundlich adsorption isotherm.

19. The fundamental and first overtone transitions of $^{14}N^{16}O$ are centred at 1876.06 cm^{-1} and 3724.20 cm^{-1}, respectively. Evaluate the equilibrium vibration frequency, the anharmonicity constant and the zero-point energy.

[Ceiling of marks: 30]

Section C (Essay)
(Answer any one. Each question carries 10 marks)

20. (a) Explain the factors effecting intensity of spectral lines, assuming the molecule to be a rigid rotor.

(b) The rotational constant for CO is observed to be 1.9212 cm^{-1}. Calculate the energy of J=3 level in Joules.

21. (a) Define quantum yield. (2 marks)

(b) Explain the mechanism and quantum yield of the following reactions.

$(i) H_2 + Cl_2 \xrightarrow{h\nu} 2HCl$

$(ii) H_2 + Br_2 \xrightarrow{h\nu} 2HBr$

(8 marks)

[1 x 10 = 10 Marks]

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Fifth Semester B.Sc Chemistry Degree Examination, November 2024
(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. How are condensation polymers formed? Give one example.
2. What are PGA and PLA? Mention their uses.
3. Write a note on cortical hormones.
4. Explain antioxidants with examples.
5. How do junk foods adversely affect human health?
6. How do soaps work in the cleansing process?
7. What are cosmetics? Give any two examples.
8. How can you grade a fertilizer?
9. What are rodenticides? Give an example.
10. Which class of drugs is used in sleeping pills?
11. What are the characteristics of a good fuel?
12. What is knocking? How to reduce it?

[Ceiling of marks: 20]

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

13. Differentiate thermoplastics and thermosetting plastics.
14. Explain the artificial ripening of fruits and its side effects.
15. Write a note on nitrogenous, phosphatic, and potash fertilizers.
16. Discuss the common adulterants in different food.
17. Define i) tranquilizers ii)antihistamines
    iii)psychedelic drugs (iv)analgesics. Give one example each.
18. What are coals? How can you classify coals based on carbon content?
19. Explain the chemical, generic, and trade names of drugs with examples.

[Ceiling of marks: 30]

Section C (Essay)
(Answer any one. Each question carries 10 marks)

20. What are shampoos? What are its ingredients? Write a note on its classification.
21. What are enzymes? Explain their classifications, characteristics, and roles with examples.

[1 x 10 = 10 marks]