2B5N22141 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Fifth Semester B.Sc Chemistry Degree Examination, November 2022

BCH5B07 – Organic Chemistry – II

(2019 Admission onwards)

Time: 2 hours Max. Marks: 60

SECTION A

All questions can be attended. Each questions carries 2 marks

1. Arrange the following in the increasing order of their acidic character.
   Methanol, ethanol, propan-2-ol and 2-methylpropan-2-ol.
2. Give one method of preparation of fluorescein.
3. What are crown ethers? Give an example.
4 Suggest a method for the synthesis of 1-methoxypropane. Give equation.
5. What is Oppenauer oxidation?
6. How does acetophenone react with hydrazine ?
7. Give the structural formula and IUPAC name of citric acid.
8. Give one method of preparation of benzene sulphonic acid.
9. Explain NEF reaction with suitable example.
10 Give the structural formula of sulphaguanidine.
11. What is furfural? How is it converted to furan?
12. Give one method of preparation of ethyl acetoacetate.

(Ceiling 20 Marks)

SECTION B

All questions can be attended. Each questions carries 5 marks

13. Discuss the oxidation of alcohols with the following reagents
    (i) PCC (ii) $KMnO_4$.
14. Explain Claisen rearrangement with a suitable example and suggest a mechanism for the reaction.

15. How can dimethyl zinc be converted to the following compounds

(i) neopentane (ii) ethanol (iii) butanone

16. How does ethanal react with (i) ethanol (exces) in the presence of dry HCI gas; (ii) Sodium bisulphite (iii) HCN in the presence of a base?

17. Illustrate the stereochemical outcome of the Hofmann's elimination using a suitable example.

18. Discuss the synthetic transformations of aryl diazonium salts.

19. Write a note on structure of indole.

(Ceiling 30 Marks)

SECTION C

Answer any one question. Each question carries 10 marks

20. How will you convert phenol into the following compounds?

(i) Picric acid (ii) Salicylic acid

(iii) Aspirin (iv) Phenolphthalein.

21. Discuss the relative reactivity of different carboxylic acid derivatives in nucleophilic acyl substitution

(1 x 10 = 10 Marks)

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2B5N22140 (Pages : 1) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Fifth Semester B.Sc Chemistry Degree Examination, November 2022

BCH5B06 – Inorganic Chemistry – III

(2019 Admission onwards)

Time: 2 hours Max. Marks: 60

SECTION A

All questions can be attended. Each question carries 2 marks

1. Describe elimination of the interfering radical oxalate anion.
2. What is zone refining?
3. Give examples of three different kinds of silicone polymers.
4. Draw the structure of tetrasulphur tetranitride.
5. Explain the term autoionization of solvents with an example.
6. Which are the major culprits for stratospheric ozone depletion?
7. What are the sources of water pollution?
8. What are the adverse consequences of thermal pollution?
9. Describe the structure and hybridization of ClF_3.
10. What are polyhalide ions ?
11. Describe the similarities of pseuhalogens and halogens.
12. Explain BOD and COD.

(Ceiling 20 Marks)

SECTION B

All questions can be attended. Each question carries 5 marks

13. Describe the mechanism of precipitate formation.
14. Discuss the classification of silicates.
15. Explain the colour, conductivity and magnetic property of dilute solutions of alkali metals in liquid ammonia.
16. Explain the cause for photochemical smog and classical smog.
17. Write a note on alternate refrigerants and their benefits.
18. Discuss the anaerobic digestion method of disposing solid wastes.
19. Describe the use of Ellingham diagram in metallurgy.

(Ceiling 30 Marks)

SECTION C

Answer any one question. Each question carries 10 marks

20. a) Explain the separation and isolation of noble gases. (7 marks)

    b) Describe the reactions of XeF_6 with water. (3 marks)

21. Discuss the extractive metallurgy of aluminium. **(1 x 10 = 10 Marks)**

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2B5N21143 (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Fifth Semester B.Sc Chemistry Degree Examination, November 2022

(Open Course)

BCH5D02 – Chemistry in Daily Life

(2019 Admission onwards)

Time: 2 hours Max. Marks: 60

Section A (Short answers)
(Answer questions up to 20 marks. Each question carries 2 marks)

1. Differentiate between Nylon 6 and Nylon 6,6.
2. Describe the applications of biodegradable polymers.
3. What are the sources of Vitamin C.
4. What are the functions of male sex hormones?
5. What are BHA and BHT? Give their important applications.
6. Explain the term food preservatives with suitable examples.
7. What are Pheromones?
8. Define non-degradable pesticides.
9. What are antacids. Give example.
10. Define the term Flash point for a give fuel.
11. What is a pharmaceutical drug?
12. Write the structural formula of the dye *alizarin*.

Section B (Paragraph)

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

13. What does PLA stand for? Explain its preparation and significance.
14. Discuss with example the role of permitted and non-permitted colours in the current food industry.
15. What is LPG? What are its ingredients? Mention important uses.
16. What are artificial Sweeteners? Explain with suitable examples.
17. Distinguish illustratively between the two terms antiseptics and antibiotics.
18. Write a note on "Harmful effects of cosmetics".
19. What are dye ? Explain the requirements of a good dye.

Section c (Essay)

(Answer any one. Each question carries 10 marks)

20. (a) What are the biological functions of nucleic acids?
    (b) Discuss the structural features of DNA.
21. (a) Describe the classification of Fertilizers.
    (b) Discuss the impact of excessive use of fertilizers on environment.

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Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

Fifth Semester B.Sc Chemistry Degree Examination, November 2022

BCH5B08 – Physical Chemistry – II

(2019 Admission onwards)

Time: 2 hours Max. Marks: 60

SECTION A

All questions can be attended. Each questions carries 2 marks

1. Define chain reactions. Give one example.
2. Calculate the time for half change of a first order reaction of rate constant 0.08 hr^{-1}.
3. Describe steady state approximation.
4. State and explain Stark Einstein law.
5. Distinguish between primary and secondary processes in a photochemical reaction.
6. Define adsorption isotherm and adsorption isobar.
7. Define metastable equilibrium and illustrate it with a suitable example.
8. Calculate the maximum number of phases that can coexist in equilibrium
   (i) a one-component system and (ii) a two-component system
9. Define critical solution temperature.
10. Explain what is meant by Raman shift.
11. Explain the Born-Oppenheimer approximation.
12. What is chemical shift.

(Ceiling 20 Marks)

SECTION B

All questions can be attended. Each questions carries 5 marks

13. Explain Michaelis Menten theory of enzyme catalysis.
14. A first order reaction is 30% complete in 20 minutes at 40^0C and 4 minutes at 60^0C. Calculate the energy of activation for the reaction.
15. Explain the mechanism of H_2-Br_2 reaction and discuss about its quantum yield.
16. One gram of an adsorbent required 50 ml of nitrogen at STP for monolayer formation. Calculate the surface area of the adsorbent. The area of cross section of N_2 molecule is 16.3 $Å^2$.
17. The rotational spectrum of gaseous HBr has a series of equispaced lines separated by 16.94 cm-1. Calculate the moment of inertia and bond length for HBr. [H=1.008; Br = 79.909].

18. Give a diagrammatic representation of the NMR spectrum of toluene and explain the Signals in it

19. Sketch the different vibrational modes of CO_2. Classify them as IR-active and IR inactive modes and explain your answer.

(Ceiling 30 Marks)

SECTION C

Answer any one question. Each question carries 10 marks

20. (a) Discuss the phase diagram of the sulphur system .b) Distinguish between the terms triple point and eutectic point (7 + 3 marks)

21. Discuss the theory of ESR spectroscopy and explain hyperfine spliting taking the example of methyl radical.

(1 x 10 = 10 Marks)