

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE
 Sixth Semester B.Sc. Degree Examination, March/April 2020
 BCHE6B13(E2) – Polymer Chemistry
 (2017 Admission onwards)

Time: 3 hours

Max. Marks: 80

Section A(One world)
(Answer all questions. Each question carries 1marks)

The monomer unit of natural rubber is.....

What is the chemical name of Kevlar?

Name the polymer obtained by polycondensation of hexamethylene diamine and adipic acids.

What is the range of degree of polymerisation in commercial polymers?

What is polydispersity index?

Name a polymer used in medicinal implants and orthopaedic devices.

Another name of teflon is.....

Write the structure of poly glycolic acid (PGA).

What are bakelites?

Among the brand names Melmac, Kevlar, Lexan and Nomex, which one stands for a group of polycarbonate resin.

(10 x 1 = 10 Marks)

Section B (Short answer)

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

1. Discuss the tacticity of polymers.

2. Distinguish between addition and condensation polymerisation reaction.

3. What are elastomers?

4. What are the advantages of Zeigler-natta polymerisation?

5. What are living polymers?

6. Write a short note on viscoelasticity of polymers.

7. What is meant by thermoforming?

8. How a hard polymer can be made soft and pliable?

9. How is PVC prepared? Mention its uses.

10. Write a short note on super glue.

11. What is meant by number average molecular weight?

12. Write a note on fire resistant polymers.

(10 x 2 = 20 Marks)

Section C (Paragraph)

Answer any five questions. Each question carries 6 marks

23. State Kohlrausch's law. Discuss the significance and applications.
24. Write a short note on H₂-O₂ fuel cell.
25. What are concentration cells? How are they classified?
26. Write the mechanism of rusting of iron. Which are the important methods for preventing corrosion?
27. What are the advantages of potentiometric titrations?
28. Write a short note on positive and negative deviations from Raoult's law.
29. Write a note on non-stoichiometric defects in crystals.
30. Explain the origin of Bravais lattice.

(5 x 6 = 30 Marks)

Section D (Essay)

Answer any two questions. Each question carries 10 marks

31. (a) What is transport number. How will you determine transport number?
(b) What is meant by common ion effect? Give the applications.
32. (a) Discuss briefly about conductometric titrations.
(b) Write a short note on Levelling and differentiating solvents.
33. (a) Define osmotic pressure. Describe a method for its measurement.
(b) What are non-ideal solutions? Explain their classification with examples.
34. (a) Derive Bragg's equation.
(b) Describe the powder method of X-ray diffraction of solids.

(2 x 10 = 20 Marks)

30

1B6M20249

(Pages : 2)

Reg. No:

Name:

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE
Sixth Semester B.Sc. Degree Examination, March/April 2020
BCHE6B10 – Organic Chemistry III
(2017 Admission onwards)

Time: 3 hours

Max. Marks: 80

PART A

Answer all the questions. Each question carries 1 mark

1. The visible range in electromagnetic spectrum is from to nm.
2. The number of peaks in the ¹H NMR spectrum of ethyl acetate.
3. Give the structure of β-D-Ribo furanose.
4. Give example for a sulphur containing aminoacid.
5. Write the structure of Uracil.
6. The enzyme used in C-terminal residue analysis is
7. Give example for a mineralocorticoid hormone.
8. is an example for a drying oil.
9. *trans* isomer of natural rubber is
10. The basic λ_{max} for α,β -unsaturated 6-membered ringketone isnm.

(10 x 1 = 10 Marks)

PART B

Answer any 10 questions. Each question carries 2 marks

11. Benzene shows λ_{max} at 255 nm and for aniline the value is 280 nm. Explain the reason for bathochromic shift.
12. Describe the difference in NMR of 1,2-dichloroethane and 1,1-dichloroethane.
13. Give reason for the variation in NMR signals of ethanol on addition of small quantity of acid.
14. Elucidate the structural difference between starch and cellulose.
15. Explain Strecker synthesis.
16. Distinguish between nucleotides and nucleosides.
17. Describe the uses of two essential oils.
18. Alkaloids can be classified based on the heterocyclic ring system. Justify
19. Explain the enflourage process for the separation of essential oils.

20. Why the energy of Ψ_3 of 1,3,5-hexatriene is lower than that of Ψ_6 .
21. Explain the formation of product under thermal condition for 5,6-*trans*-dimethyl-1,3-cyclohexadiene.
22. Explain the chemistry of Vulcanization. (10 x 2 = 20 Marks)

PART C

Answer any 5 questions. Each question carries 6 marks

23. Identify the structure of the compound with molecular formula $C_6H_{12}O_2$ and spectral data, H-NMR [2.5 (s, 3H), 1.5 (s, 9H)] and IR at 2924 cm^{-1} (m), 1745 cm^{-1} (s) and 1456 cm^{-1} (s).
24. How will you calculate bond length in a molecule using microwave spectra?
25. Maltose is a reducing sugar but sucrose is non-reducing. Justify
26. Explain the use of electrophoresis for the separation of aminoacids.
27. Describe the non covalent forces that will stabilize DNA double helix.
28. Suprafacial [1,5] carbon migration should occur with retention of configuration in the migrating group. Justify
29. $\pi^4s + \pi^2$ cycloaddition is thermally allowed and forbidden photo chemically. Give reason
30. Discuss the role of RNA's in protein synthesis. (5 x 6 = 30 Marks)

PART D

Answer any 2 questions. Each question carries 10 marks

31. a) Explain methods for the detection of sugar in urine and blood.
b) Glucose and Fructose form identical osazones. Justify.
32. Describe the process for 'acquiring the pattern of the unique base sequence of DNA' and explain its applications.
33. Describe the classification, sources, structure and deficiency disorder of Vitamins.
34. Describe the 1°, 2°, 3° and 4° structure of protein. (2 x 10 = 20 Marks)

1B6M20248

(Pages : 2)

Reg. No:.....

Name:

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE
Sixth Semester B.Sc. Degree Examination, March/April 2020
BCHE6B09 – Inorganic Chemistry IV
(2017 Admission onwards)

Time: 3 hours

Max. Marks: 80

Section A (One word)

Answer all questions. Each question carries 1 mark

1. Give one application of Ziegler-Natta catalyst.
2. The lack of which vitamin causes the disease pernicious anaemia?
3. The intense violet colour of $KMnO_4$ is due to.....transitions.
4. What is the hybridisation of Co in the complex $K_2[Ni(CN)_4]$.
5. Complete the chemical reaction: $Cr_2O_7^{2-}(aq) + H_2S(g) + H^+(aq) \rightarrow$
6. Calculate the CFSE for a d^4 system in a tetrahedral field.
7. In Ziese's salt, the π - donor ligand is.....
8. Name the metal which produced the outbreak of the Minamata disease by means of water pollution.
9. Give the composition of German silver.
10. Write the formula of ilmenite.

(1 x 10 = 10 Marks)

Section B (Short answer)

Answer any ten questions. Each question carries 2 marks

11. Give the IUPAC names of (a) $[Co(NH_3)_5CO_3]Cl$ and (b) $K_3[Fe(ox)_3]$.
12. Explain van Arkel method for the refining of titanium.
13. What is chelate effect?
14. Calculate the spin-only magnetic moment of Fe^{3+} and Mn^{2+} .
15. What is spectro chemical series?
16. What are intramedullary rods?
17. The ionisation energy of transition elements are in the order $5d > 3d > 4d$. Why?
18. Give an example with structure for a non-bridged polynuclear carbonyl.
19. Give structure and significance of carboplatin.
20. Give one method of preparation for ferrocene?
21. What are essential elements?
22. What is Wilkinson's catalyst? Write its uses.

(2 x 10 = 20 Marks)

Section C (Paragraph)

Answer any five questions. Each question carries 6 marks

23. What is meant by Ellingham diagram? Explain its application in metallurgy.
24. Discuss the geometrical isomerism exhibited by co-ordination compounds.
25. Give three reactions with equations to illustrate the oxidising action of potassium dichromate.
26. Explain Werner's co-ordination theory.
27. Explain zone refining and Mond's process.
28. Illustrate the applications of complexes in quantitative analysis.
29. Explain with balanced equations the action of KMnO_4 in acid medium on the following:
(i) Fe^{2+} , (ii) H_2S and (iii) $\text{H}_2\text{C}_2\text{O}_4$.
30. Explain briefly on the bonding in metal carbonyls.

(6 x 5 = 30 Marks)

Section D (Essay)

Answer any two questions. Each question carries 10 marks

31. Discuss the crystal field splitting in octahedral complexes. On the basis of CFT show that $[\text{CoF}_6]^{3-}$ is paramagnetic.
32. Discuss the extraction of pure copper from its principal ore.
33. Briefly explain the isolation and separation process of lanthanides from monazite sand.
34. Explain the structure and mechanism of oxygen binding of haemoglobin.

(10 x 2 = 20 Marks)