



K22U 1545

Reg. No. :

Name :

IV Semester B.Sc. Degree CBCSS (OBE) Regular/Supplementary/
Improvement Examination, April 2022
(2019 Admission Onwards)

COMPLEMENTARY ELECTIVE COURSE IN CHEMISTRY/
POLYMER CHEMISTRY

4C04CHE/PCH (PS) : Chemistry (for Physical Science)

Time : 3 Hours

Max. Marks : 32

SECTION – A

(Very short answer type. **Each** carries 1 mark. Answer **all 5** questions.)

1. How many number of atoms are present per unit cell in FCC lattice ?
2. The SI unit of surface tension is _____
3. What is the product of conductance of an electrolyte solution and cell constant ?
4. What is the value for compressibility factor (Z) of an ideal gas ?
5. What is EMF of a cell ? (5×1=5)

SECTION – B

(Short answer type. **Each** carries 2 marks. Answer **any 4** questions out of 6.)

6. What are colligative properties ? Give two examples.
7. Define most probable velocity of a gas.
8. Suggest any one preparative method for synthesizing nanoparticles.
9. State the law of rationality of indices.
10. What is meant by a reversible cell ? Give an example.
11. Calculate the RMS velocity of N_2 molecules at $0^\circ C$. (4×2=8)

P.T.O.

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SECTION – C

(Short essay type. **Each** carries 3 marks. Answer **any 3** questions out of 5.)

12. Explain Bragg's law.
13. Draw the conductometric titration curve of a strong acid against a weak base. Explain.
14. Discuss Van der Waal's equation and explain the significance of a and b.
15. Discuss the optical properties of nanomaterials.
16. Calculate the EMF of the following cell at 298K
 $\text{Mg(s)}/\text{Mg}^{2+} (0.001\text{M}) \parallel \text{Cu}^{2+} (0.001\text{M})/\text{Cu(s)}$. Given $E^\circ_{\text{Mg}^{2+}/\text{Mg}} = -2.37 \text{ V}$,
 $E^\circ_{\text{Cu}^{2+}/\text{Cu}} = +0.34\text{V}$. (3×3=9)

SECTION – D

(Long essay type. **Each** carries 5 marks. Answer **any 2** questions out of 4.)

17. Sketch and explain Maxwell's distribution curve and explain the effect of temperature on distribution of molecular velocities.
 18. State and explain Henry's law. What are its limitations ? Discuss its applications.
 19. Write a short note on potentiometric titration and its application.
 20. Describe how conductivity measurements can be used to determine the solubility of a sparingly soluble salt in water. (2×5=10)
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Improvement Examination, April 2022
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COMPLEMENTARY ELECTIVE COURSE IN CHEMISTRY/POLYMER
CHEMISTRY

4C04CHE/PCH (BS) : Chemistry (For Biological Science)

Time : 3 Hours

Max. Marks : 32

Instruction : Write only in English.

SECTION – A

Very short answer type. **Each** carries 1 mark. Answer **all 5** questions.

1. Among glucose, fructose, sucrose and ribose, which one is a ketohexose ?
2. What is the monomer of starch ?
3. The 'N' atom in Pyridine is in a state of _____ hybridization.
4. In normal DNA, to which base does adenine pair with ?
5. What is the oxidation state and coordination number of Fe in hemoglobin ?

SECTION – B

Short answer type. **Each** carries 2 marks. Answer 4 questions out of 6.

6. Explain why Furan is less reactive towards electrophilic substitution than Pyrrole.
7. Explain two electrophilic substitution reactions of Quinoline.
8. Give the differences between DNA and RNA.
9. Define Isoelectric point.
10. What are Hormones ? Why are they called chemical messengers ?
11. Discuss the importance of Zinc in biological systems.

P.T.O.



SECTION - C

Short essay type. **Each** carries 3 marks. Answer 3 questions out of 5.

12. Write a short note on the structure of Cellulose.
13. What are the different reduction products obtained for pyridine under different conditions ?
14. Discuss the double helical structure of DNA.
15. Write a short note on Sorensen formol titration.
16. How the Vitamins are classified ? Give a short note on any three Vitamins belonging to each class.

SECTION - D

Long essay type. **Each** carries 5 marks. Answer 2 questions out of 4.

17. i) Explain any one chemical test to distinguish between glucose and fructose. 2
ii) Explain the action of phenylhydrazine on glucose and fructose. 3
 18. Discuss the Primary, Secondary and Tertiary structure of Proteins.
 19. Describe the biological fixation of nitrogen.
 20. What are Enzymes ? Explain the main characteristic features of Enzymes.
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CORE COURSE IN CHEMISTRY/POLYMER CHEMISTRY
4B06 CHE/PCH : Organic Chemistry – II

Time : 3 Hours

Max. Marks : 40

Instruction : Answer the questions in **English** only.

SECTION – A

(Very short answer type. **Each** carries 1 mark. Answer **all 4** questions.)

1. The intermediate formed in Cope elimination is _____
2. Dehydration of Glycerol in acid gives _____
3. Victor Meyers reagent is _____
4. Reduction of ketone with Zn-Hg and Conc. HCl yield _____ (4×1=4)

SECTION – B

(Short answer type. **Each** carries 2 marks. Answer 7 questions out of 10.)

5. Give the structure and name of the product that would be obtained from the ionic addition of HBr to 2-methyl-1-butene.
6. Arrange the following cycloalkanes in order of increasing Baeyer's angle strain
(a) cyclobutane (b) cyclopentane (c) cyclopropane.
7. Predict products obtained by Hydroboration oxidation of Butyne ?



8. Write two methods of preparation of Carbon tetrachloride.
9. Write the reaction steps involved in preparation of 1-propanol by Grignard reagent.
10. What is Oppenauer oxidation?
11. Write the mechanism of addition of KCN to the acetaldehyde.
12. What products would be obtained by reduction of cinnamaldehyde with NaBH_4 and LiAlH_4 ?
13. What is Wittig reaction?
14. How will you differentiate acetaldehyde and acetone by simple chemical tests?

(7×2=14)

SECTION - C

(Short essay/problem type questions. **Each** question carries 3 marks. Answer 4 questions out of 6.)

15. 3-bromo-1-butene and 1-bromo-2-butene undergo $\text{S}_{\text{N}}1$ reaction at nearly the same rate even though one is secondary halide and other is primary. Explain.
16. Explain E1 mechanism with an example.
17. Give any three methods of preparation of alkyne.
18. Write a short note on Diels Alder reaction.
19. Discuss $\text{S}_{\text{N}}\text{Ar}$ mechanism.
20. Write the mechanism of Fries rearrangement.

(4×3=12)



SECTION – D

(Long essay type. **Each** carries 5 marks. Answer 2 questions out of 4.)

21. Discuss the role of solvent and Nucleophile on relative rate of S_N1 versus S_N2 reaction.

22. Answer the following :

a) Alkynes are less reactive than alkenes toward addition of Br_2 .

b) Why terminal alkyne is acidic but internal alkyne is not ?

c) Hydrogenation of an alkyne cannot be stopped at the alkene stage.

d) How to prepare Anthracene from Benzyl chloride ?

23. a) Discuss Claisen rearrangement with mechanism.

b) Explain Hauben-Hoesch reaction.

c) Phenol is more acidic than Ethyl Alcohol, why ?

24. i) Discuss Wolf Kishner reduction.

ii) Write the mechanism of the following :

a) Beckmann rearrangement.

b) Benzil-Benzilic acid rearrangement.

1

1

1

2

2

1½

1½

1

2

2

(2x5=10)