

**2024/FYUG/ODD/SEM/
CHMSEC-101T/187**

FYUG Odd Semester Exam., 2024

**CHEMISTRY
(1st Semester)**

Course No. : CHMSEC-101T

(Separation Techniques)

Full Marks : 50

Pass Marks : 20

Time : 2 hours

*The figures in the margin indicate full marks
for the questions*

UNIT—I

1. Answer any three from the following questions : 1×3=3

- (a) Name the law that governs the solvent extraction.
- (b) Which solvent is used to extract uranium by solvation process?
- (c) Name two organic compounds which are purified by sublimation.
- (d) What is fractional distillation?

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(Turn Over)



(2)

2. Write a short note on counter-current extraction. 2

OR

3. What are the criteria for the selection of solvent for crystallization? 2

4. (a) Discuss the mechanism of extraction by solvation process. Give two applications of solvent extraction. 2+1=3

- (b) Explain the term chelation. 2

OR

5. (a) Write the mechanism of purification of camphor by sublimation. 3

- (b) What are basic principle of distillation technique? 2

UNIT—II

6. Answer any three from the following questions : 1×3=3

- (a) What are the stationary and mobile phases in paper chromatography?

- (b) What is adsorbent?

- (c) Paper chromatography is an example of _____ chromatography.

(Fill in the blank)

- (d) What is an eluent?

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(Continued)

(3)

7. Write the principle of adsorption chromatography. 2

OR

8. Discuss the basic principle of column chromatography. 2

9. (a) What is HPLC? Explain the principle involve in it. 1+2=3

- (b) What is meant by development of chromatogram? 2

OR

10. (a) Discuss briefly the method of analysis by TLC. 3

- (b) Describe the procedure of partition chromatography. 2

UNIT—III

11. Answer any three from the following questions : 1×3=3

- (a) What is cationic exchanger?

- (b) Give two applications of ion-exchange chromatography.

- (c) Name the two examples of ion-exchange resins.

- (d) What are zeolites?

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(Turn Over)



(4)

12. What are the characteristics of anion exchanger? 2

OR

13. Explain crystal lattice exchange theory. 2

14. (a) What are the advantages and limitations of ion-exchange chromatography? 3

(b) Discuss the principle of ion-exchange chromatography. 2

OR

15. (a) Describe the method to find ion-exchange capacity of anion-exchange resins. 3

(b) What is ion-exchange capacity? 2

UNIT—IV

16. Answer any three from the following questions : 1×3=3

(a) What are minerals?

(b) Which of the following ores are concentrated by froth flotation process?

(i) Haematite

(ii) Galena

(iii) Copper pyrites

(iv) Magnetite

(Choose the correct option)

(c) What is smelting?

(d) Name the two ores of zinc.

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(Continued)

(5)

17. Define cast iron and pig iron. 2

OR

18. What are flux? Explain with examples. 2.

19. What is leaching? Explain the leaching process of bauxite ore. 1+4=5

OR

20. Describe the extraction and purification process of copper from copper pyrites. 5

UNIT—V

21. Answer any three from the following questions : 1×3=3

(a) Name two amino acids mixture which can be separated by horizontal paper chromatography.

(b) What is the common reagent used for separated a mixture of benzoic acid and para-toluidine?

(c) What is TLC?

(d) What is R_f value?

22. What is ascending and horizontal paper chromatography? 2

OR

23. What are the important steps involved for separating a mixture of two sugars by ascending paper chromatography? 2

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(Turn Over)

24. Describe the principle and process of separation of a mixture of ortho- and para-nitrophenol by thin layer chromatography.

2+3=5

OR

25. Explain the separation and purification of process of a binary mixture of para-nitrotoluene and para-anisidine by using solubility.

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