

1M4M18143

(Pages : 2)

Reg. No:.....

Name:

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE
Fourth Semester M.Sc Degree Examination, March 2018
CH4C13 –Advanced Topics in Chemistry
(2016 Admission onwards)

Max. Time: 3 hours

Max. Weightage : 36

Part A

Answer all questions. (Each question carries 1 weightage)

1. What are nanocatalysts?
2. Write z-matrix of H-CHO.
3. Write any two limitations of combinatorial chemistry.
4. What is meant by 'greening' of a chemical process? How can Aldolcondensation reaction be greened.
5. Write a note on supramolecular devices.
6. Illustrate the use of nanomaterials as drug carriers. What are the advantages and disadvantages?
7. Explain molecular shuttle bus in connection with phase transfer catalysis.
8. Give two examples for top down and bottom up paths in nanoscience.
9. Explain bio catalysis with an example.
10. What is meant by deconvolution?
11. What are chemosensors?
12. Write a note on photovoltaic cells.

(12 x 1 = 12 Weightage)

Part B

Answer any 8 questions. (Each question carries 2 weightage)

13. Describe briefly the principles of green chemistry.
14. Give an account on ELISA and ELOSA tests.
15. Give an account on the multifunctional nature of three way catalysts used in catalytic converters.
16. Write a note on ab-initio methods.
17. Briefly explain cation binding receptors with few examples.
18. Give a brief account on the synthesis and applications of graphenes.
19. Explain the nano structure formation by lithography.
20. Describe in detail the split and pool method of solid phase synthesis of peptide.
21. Discuss briefly 'Temperature-Programmed Desorption' method for determination of surface acidity of catalysts.
22. Write short note on working principle of dye sensitized solar cells.
23. Discuss any one method for determination of pore structure of catalysts.
24. What is molecular recognition? Explain the different factors of molecular recognition.

(8 x 2 = 16 Weightage)

Part C

Answer any 2 questions. (Each question carries 4 weightage)

25. Write short notes on
(a) Renewable energy sources (b) Preparation of heterogeneous catalysts
26. How can size, structure and properties of nanomaterials be determined?
27. Explain in detail 'Supramolecular interactions'.
28. Establish the significance of SAR and QSAR in drug design?

(2 x 4 = 8 Weightage)

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(Pages : 2)

Reg. No:.....

Name:

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE
Fourth Semester M.Sc Degree Examination, March 2018
CH4C12 –Instrumental Methods of Analysis
(2016 Admission onwards)

Max. Time: 3 hours

Max. Weightage : 36

Section A

Answer all questions. Each carries 1 weightage

1. How many significant figures are there in the following?
a) 1.40×10^3 , b) 6.01, c) 02947.1, d) 583.02
2. What do you mean by correlation coefficient?
3. What is the role of buffer solution in complexometric titration?
4. What are masking and demasking agents? Explain with examples
5. What is the principle of pH measurement using glass electrode?
6. Write two advantages of potentiometric titrations over other methods employing indicators.
7. What is a photomultiplier tube? How does it work?
9. What is the principle of atomic absorption spectroscopy?
10. How is a TEM differ from SEM ?
11. What is meant by ESCA?
12. Write the principle of gel permeation chromatography.

(12 x 1 = 12 weightage)

Section B

Answer any eight questions. Each carries weightage 2

13. Write a note on linear regression.
14. Explain the properties required for metal ion indicators. Give examples.
15. Write a note on any four solvents for non aqueous titrations.
16. Explain the working, advantages and disadvantages of dropping mercury electrode.
17. Discuss the principle and applications of chronopotentiometry.
18. Write a note on interferences in AAS.
19. Explain glow discharge atomisation technique.

20. What are the applications of X-ray absorption and diffraction methods.
21. How α and β radiations are measured?
22. Write the principle and applications of isotope dilution methods.
23. Explain the instrumentation of gas chromatography.
24. Differentiate between paper and column chromatography.

(8 x 2 = 16 weightage)

Section C

Answer two questions. Each carries weightage 4

25. (a) Explain student's t -test and F -test.
(b) What do you mean by a titration curve? Explain the titration curves of strong acid-strong base, weak acid-weak base and polyprotic acids.
26. Write notes on
 - a) Square wave polarography .
 - b) Anodic stripping voltammetry.
27. a) Explain the various types of spectrophotometric titration curves with examples.
b) Explain the principle, instrumentation and applications of atomic fluorescence spectrometry.
28. a) Discuss the principle and instrumentation in DSC.
b) How is CHN analysis carried out by gas chromatography?

(2 x 4 = 8 weightage)

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(Pages : 2)

Reg. No:.....

Name:

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE
Fourth Semester M.Sc Degree Examination, March 2018
CH4E06 –Natural Products & Polymer Chemistry
(2016 Admission onwards)

Max. Time: 3 hours

Max. weightage: 36

Section A

Answer all questions. Each question carries one weightage

- 1 Explain weight average molecular weight and number average molecular weight.
- 2 Explain the term spherulites and Lamellae.
- 3 What do you mean living polymers?
- 4 Write an example for metathesis polymerization reactions.
- 5 Define the term tacticity
- 6 What are polyurethanes? Give an example and its use.
- 7 How do you isolate anthocyanins from plants?
- 8 Write the structure of the major compound present in the essential oil of sandalwood and ginger.
- 9 Write the general structure of flavonol and isoflavone.
- 10 What is gem-dialkyl rule in terpenoids? Give an example.
- 11 Write any two methods for the isolation essential oil from plants.
- 12 Write a note on aromatherapy.

(12 x 1 = 12 weightage)

Section B

Answer any eight questions. Each question carries two weightage

- 13 Write a note on the determination of degree of crosslinking and molecular weight between cross links.
- 14 What are supramolecular systems? Illustrating an example, describe how the supramolecular systems exhibit molecular recognition.
- 15 Write a note on conducting polymers.

- 16 Analyze how the Light scattering and GPC techniques are useful in the molecular weight determination.
- 17 What is Tg? What are the factors affecting Tg?
- 18 Derive Flory-Reiner equation and explain its importance.
- 19 What are supramolecular systems? Illustrating an example, describe how the supramolecular systems exhibit molecular recognition.
- 20 Write a synthetic method for the preparation of Prostaglandin PGE₂.
- 21 Distinguish between dyes and Pigments. Discuss the isolation and structure of α , β , and γ -carotenes.
- 22 Write a method of synthesis of abietic acid.
- 23 Write a method of isolation of alkaloids. Describe the classification methods of alkaloids.
- 24 Elucidate the structure of corticosterone.

(8 x 2 = 16 weightage)

Section C

Answer any *two* questions. Each question carries *four* weightage

- 25 Explain the structural elucidation of quinine.
- 26 Explain the structural elucidation of cholesterol. How will you convert cholesterol into testosterone?
- 27 Derive Flory-Huggins equation for polymer solutions.
- 28 (a) Explain the kinetics and mechanism of free radical polymerisation.
(b) What is Ziegler – Natta catalysts? Illustrating the mechanism of action, how it is useful in controlling polymerization process. What are its disadvantages?

(2 x 4 = 8 weightage)