17P412 (Pages: 2) Name…….……

Reg. No……..

FOURTH SEMESTER M.Sc. DEGREE EXAMINATION, APRIL 2019

(CUCSS - PG)

(Chemistry)

CC15P CH4 C12 – ADVANCED TOPICS IN CHEMISTRY

(Regular/Improvement/Supplementary)

(2015Admission onwards)

Time: Three Hours Maximum: 36 Weightage

PART A

Answer ***all*** the questions. Each question carries 1 weightage.

1. What are mesoporous materials? Give examples.
2. Write the z-matrix of HCHO.
3. What are quantum dots? Give example.
4. What are the advantages of solid phase chemical synthesis?
5. Write down the principle involved in fluorescence immunoassay.
6. Write a short note on microwave assisted organic synthesis.
7. Explain the term prodrug with an example.
8. What are supramolecular devices? Cite examples.
9. How the catalysis in automobile exhaust become environment protecting?
10. Define the term self assembly. Give an example of a self assembled supramolecular system.
11. Mention some of the green and safer alternatives for solvents and auxiliaries in a chemical reaction.
12. Explain the term renewable resources in the context of energy generation and chemical synthesis.

(12 × 1 = 12 Weightage)

PART B

Answer any ***eight*** questions. Each question carries 2 weightage.

13. Discuss the mechanism and experimental conditions of Fisher-Tropsch process.
14. Explain briefly the mix and split method of combinatorial synthesis. What are the advantages of this method over parallel synthesis?
15. How does the reactivity and catalysis represent a major feature of functional properties of supramolecular system?
16. Discuss the working principle and components of a dye sensitized solar cell.

17. Briefly explain Hartree-Fock SCF method.
18. Explain the working of AFM with a neat sketch.
19. Illustrate the role of Zeolites in heterogeneous catalysis.
20. What are basis sets? Briefly discuss the classification of basis sets.
21. Combinatorial chemistry is an invaluable tool for the drug discovery process. Discuss.
22. Discuss the application of nanomaterials in electronic and biomedical applications.
23. Explain the terms pharmacophore and pharmacodynamics in medicinal chemistry.
24. What are phase transfer catalysts (PTCs)? Discuss application of any two different PTCs in organic synthesis.

(8 × 2 = 16 Weightage)

PART C

Answer any ***two*** questions. Each question carries 4 weightage.

25. Discuss about different molecular receptors for binding neutral, cationic and anionic guest molecules along with their non-covalent interactions.
26. Distinguish between top-down and bottom-up approaches for the synthesis of nanomaterials. Illustrate with two different methods in each case.
27. What is meant by rational approach to drug design? Explain different physico-chemical parameters affecting drug action.
28. "Green chemistry is sustainable chemistry". Justify the statement.

(2 × 4 = 8 Weightage)

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