

C 22008

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Name.....

Reg. No.....

FOURTH SEMESTER M.Sc. DEGREE EXAMINATION, JUNE 2017

Chemistry

CH4 CO9—ADVANCED TOPICS IN CHEMISTRY

(2010 Admissions)

Time : Three Hours

Maximum : 36 Weightage

Part A

Answer all questions.

Each question has weightage 1.

1. What are the metal bonds seen in clusters ?
2. Describe double bonded metal-metal non carbonyl metal clusters.
3. Write examples of insertion reactions in which $O=C=O$ and $R-N=C$ are inserted.
4. Illustrate the oxidative coupling of organometallic compounds with an example.
5. Which are the catalysts useful for alkene isomerisations ?
6. What are the applications of water gas shift reaction ? How does it take place ?
7. What is rational drug design ?
8. Write a synthesis of $p\text{-MeCO-NH-C}_6\text{H}_4\text{-OH}$ used as an antipyretic and analgesic.
9. With a specific examples, show how Atom Economy can be calculated.
10. What is the significance of self assembly in nano material formation ? How does it work ?
11. Explain with examples smart materials.
12. Define biomimetics and illustrate with examples.
13. Where does one find $\pi\text{-}\pi$ stacking. What is its importance ?
14. How can dendrimers be manufactured ?

(14 × 1 = 14 weightage)

Turn over

Part B

*Answer any seven questions.
Each question has weightage 2.*

15. Write a note on Wade-Mingos-Lauher rules.
16. Discuss the structure and formation of higher carbonyl clusters.
17. Explain electrophilic addition reactions in organometallic compounds.
18. What is Collman reagent ? What is its application ?
19. Describe an industrial process for acetic acid manufacture.
20. Illustrate the chemical steps in Wacker process.
21. Explain how microwave irradiations promote chemical reactions. Write examples.
22. How can the dimensions of nano materials be determined ?
23. Explain the methods used for obtaining nano composites.
24. Why are quantum dots so called ? How can these be made ?

(7 × 2 = 14 weightage)

Part C

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

25. Define Structure Activity Relationships SAR and explain its importance as part of drug design.
26. Write a brief account of the major principles that form the basis of green chemistry.
27. Describe the methods by which nanostructures can microscopically and spectroscopically be determined.
28. Write brief notes on : (i) molecular recognition (ii) gelators fibres and adhesives.

(2 × 4 = 8 weightage)