BSc DEGREE END SEMESTER EXAMINATION - MARCH 2019

SEMESTER 6: CHEMISTRY

COURSE: **15U6CRCHE13EL: ADVANCES IN CHEMISTRY**

(For Regular - 2016 Admission and Supplementary/Improvement - 2015 Admission)

Time : Three Hours   Max. Marks: 75

Section A
Answer any 10 (1 marks each)

1. Give an example of a green water purifying agent

2. What is FGA ?

3. What is target in retro synthetic analysis ?

4. Mention any two advantages of microwave being used as a heating method

5. Write any two disadvantages when polymers are used as biomaterials.

6. The most stable and lowest energy structure of a molecule is called --------

7. Give an example of semi-empirical method

8. The Hamiltonian operator in HF method is called ---------

9. ------- is a technique used to obtain a stable minimum energy geometry of a molecule from a given geometry.

10. What are refractory material? Give an example.

11. What are quantum dots?

12. Give any two examples for nano composities.

13. What are nano medicines?

14. Which are the starting materials used for the synthesis of nickel nano particles?

$$(1 \times 10 = 10)$$

Section B
Answer any 10 (2 marks each)

15. What are High-temperature and fire-resistant polymers?

16. Explain atom economy citing a suitable example.

17. What do you mean by FGE in retrosynthetic analysis? Give an example

18. Explain the biocompatibility of biomaterials.

19. What are p-doped and n-doped conducting polymers?

20. Calculate the number of basis functions required to prepare the minimal basis set of nitrogen atom and nitrogen molecule. Justify your answer.

21. Write the Z matrix of water molecule.

22. Explain why the oxidation of glucose is a spontaneous process.

23. Explain density functional theory in computational calculation
24. What is glass? Give its approximate chemical composition.
25. What is molar absorbance of a solution?
26. State and explain Beer-Lamberts Law.
27. What is the difference between Top Down and Bottom Up Processes involved in the syntheis of nanomaterials?
28. Discuss in detail about the properties of fullerenes.

(2 x 10 = 20)

Section C
Answer any 5 (5 marks each)

29. Explain the importance of molecular recognition in DNA
30. Compare static versus dynamic molecular recognition
31. Give the retrosynthetic analysis of salbutamol
32. What is the scope of computational chemistry? Explain the different applications of computational chemistry.
33. Discuss in detail about the informations obtained from the titration curves of aminoacids.
34. Explain internal and external coordinate formats of methane molecule.
35. Explain in detail about a) chemical vapour deposition method and b) mechanochemical method for the synthesis of nanomaterials.
36. Give method of preparation and applications of carbon monofluoride.

(5 x 5 = 25)

Section D
Answer any 2 (10 marks each)

37. Explain in detail about a) biopolymers, b) Silicones and c) carbon fibres. (4 + 3 + 3)
38. Explain in detail about
    a) Structure of proteins and b) Titration curves of amino acids.   (5 + 5)
39. What are silicates? How they are classified? Give their structure and applications.
40. With suitable examples show that TGA and DTA techniques are complementary to each other.

(10 x 2 = 20)