Reg. No ....   Name ....

BSc DEGREE END SEMESTER EXAMINATION- MARCH 2020
SEMESTER 6 : CHEMISTRY
COURSE : **15U6CRCHE13EL ; ADVANCES IN CHEMISTRY**
(For Regular - 2017 Admission & Supplementary - 2016/2015 Admissions)

Time : Three Hours   Max. Marks: 75

Section A
Answer any 10 (1 marks each)

1. What are silicones?
2. What is FGE
3. Atom economy is ....
4. Why polymers made with aromatic monomers are used as High temperature and fire-resistant polymers?
5. Give an example of a red gas
6. .... method in computational chemistry is a mixing of theoretical and experimental methods.
7. The smallest basis sets are called ....
8. Give an example of molecular simulation software
9. The buffer system present in blood is ....
10. Name in general the two processes involved in the synthesis of nanomaterials.
11. Principle of Colorimetric estimation is ....
12. The basic unit in silicates is ....
13. Which are the starting materials used for the synthesis of silver nano particles?
14. Rb or Li which readily forms intercalation compound?

(1 x 10 = 10)

Section B
Answer any 10 (2 marks each)

15. What are the problems associated with the burning of plastics?
16. What are the advantages of using vitamin C as a water purifying agent?
17. What do you mean by target in retrosynthetic analysis? Give an example
18. Explain the biocompatibility of biomaterials.
19. What are p-doped and n-doped conducting polymers?
20. Write a note on ab initio calculations
21. Explain bioenergetics.
22. Calculate the number of basis functions required to prepare the minimal basis set of water and methane. Justify your answer.
23. The total energy calculated for the same molecule by an HF and DFT method are different when the same basis set is used. Give reasons.
24. How do enzymes act as biological catalyst?
25. Discuss in detail about the applications of fullerenes.

26. What are the applications of nano composities?
27. Why graphite is suitable to give many intercalation compounds?
28. Fullerene does not exhibit super aromaticity. Explain

(2 x 10 = 20)

Section C
Answer any 5 (5 marks each)

29. Explain the importance of molecular recognition in DNA
30. Give the retrosynthetic analysis of salbutamol
31. Explain in detail about biopolymers.
32. Explain the model chemistry calculations involving single point energy and geometry optimization of carbon dioxide molecule. Give the input and output files of the computational quantum chemistry calculation.
33. Explain in detail about the inhalation and exhalation processes in breathing.
34. Explain in detail how the formation of glucose-6-phosphate from glucose takes place spontaneously. Give the corresponding reactions.
35. Give the principle and procedure of the colorimetric estimation of iron.
36. Discuss in detail about the properties and applications of quantm dots.

(5 x 5 = 25)

Section D
Answer any 2 (10 marks each)

37. Explain the different types of secondary interactions in supramolecular chemistry with examples
38. Compare and contrast different quantum mechanical and classical mechanical methods in computational chemistry.
39. a) What are refractory materials? Discuss the various compounds used as refractory materials, b) What are glasses? How it is manufactured? Give the different types of glasses.   (5+5)
40. Explain in detail about any five methods for the synthesis of nanomaterials.

(10 x 2 = 20)