Reg. No ..... Name **21U657**

B. Sc. DEGREE END SEMESTER EXAMINATION - APRIL 2021

SEMESTER 6 : CHEMISTRY

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

(Common for Regular - 2018 Admission & Supplementary 2017/2016/2015Admissions)

Time : Three Hours Max. Marks: 75

PART A

Answer any 10 (1 marks each)

1. Give any two examples for the inorganic polymers which are used as High temperature and fire-resistant polymers.
2. What is FGI
3. What is target in retro synthetic analysis ?
4. Atom economy is.....
5. Write any two disadvantages when metals are used as biomaterials.
6. What is isoelectric point?
7. Give any two reactions which are catalysed by enzymes.
8. Give an example of molecular simulation software
9. The potential energy of the moving macro molecular system is obtained from a potential energy expression called .....
10. What is the principle behind the chemical vapour deposition method for the synthesis of nanomaterials?
11. What are nano medicines?
12. Name any two solvents used for the dissolution of fullerenes.
13. In TGA thermogram ..... is plotted against temperature.
14. Give the chemical formula of Buckminsterfullerene.

(1 x 10 = 10)

PART B

Answer any 10 (2 marks each)

15. Explain the biocompatibility of biomaterials.
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. Suggest any two green energy sources. Why they are green?
19. What are p-doped and n-doped conducting polymers?
20. Distinguish between global minimum and local minimum in a potential energy surface
21. Distinguish between internal and external coordinates.
22. Plot the potential energy graph of isomerization reaction of hydrogen cyanide.
23. Explain in detail about the inhalation process in breathing
24. What are zeolites? How it is suitable for water softening?
25. State and explain Beer-Lamberts Law.
26. Discuss in detail about the applications of fullerenes.
27. What is the difference between Top Down and Bottom Up Processes involved in the syntheis of nanomaterials?
28. How the electrical conductivity of intercalation compounds of alkali metals with graphite vary with temperature? Why?

(2 x 10 = 20)

PART C
Answer any 5 (5 marks each)

29. Explain in detail about High temperature and fire-resistant polymers.
30. Give the retrosynthetic analysis of acetophenone
31. Explain minimal basis sets with examples. Distinguish between Slater type and Gaussian type basis sets.
32. Explain the model chemistry calculations involving single point energy and geometry optimization of water molecule. Give the input and output files of the computational quantum chemistry calculation.
33. Explain in detail how the formation of glucose-6-phosphate from glucose takes place spontaneously. Give the corresponding reactions.
34. What are glasses? How it is manufactured? Give the different types of glasses.
35. Discuss in detail about the properties and applications of carbon nanotubes.
36. Write a brief note on the preparation and uses of interstitial Carbides Nitrides and Borides.

(5 x 5 = 25)

PART D
Answer any 2 (10 marks each)

37. Explain in detail about a) biopolymers, b) Silicones and c) carbon fibres. (4 + 3 + 3)
38. Compare and contrast different methods in computational chemistry.
39. Explain in detail about any five methods for the synthesis of nanomaterials.
40. What are silicates? How they are classified? Give their structure and applications.

(10 x 2 = 20)