

**SIXTH SEMESTER B.Sc. DEGREE EXAMINATION, MARCH/APRIL 2018**

(CUCBCSS—UG)

Chemistry

CHE 6B 12—ADVANCED AND APPLIED CHEMISTRY

Time : Three Hours

Maximum : 80 Marks

**Section A (One word)***Answer all questions.**Each question carries 1 mark.*

1. The abbreviation PMMA stands for \_\_\_\_\_.
2. Who is credited with establishing the field of Green Chemistry during his time working for the U.S. Environmental Protection Agency as the Chief of the Industrial Chemistry Branch ?
3. A system software that manages computer hardware and software resources and provides common services for computer programs is called as \_\_\_\_\_.
4. Name the major ingredient used as detergent in toothpaste.
5. Which is the main ore used in the sulphate method of  $\text{TiO}_2$  preparation ?
6. Name one refractory boride.
7. Name an antiknock agent used in petroleum industry.
8. What does CNG stand for ?
9. Aspartame is an \_\_\_\_\_.
10. Name any one of the most common primary surfactants used in modern shampoos.

(10 × 1 = 10 marks)

**Section B (Short Answer)***Answer any ten questions.**Each question carries 2 marks.*

11. How do physical characteristics of nanomaterials differ from bulk materials ?
12. Quantum dots are examples of zero dimensional nanomaterials. Explain.
13. Explain the phenomenon 'cavitation' associated with sonochemistry.
14. What do you mean by global minimum in computational chemistry ?
15. What are the advantages of Ziegler Natta polymerization ?
16. Why is it that PLA is a biodegradable thermoplastic aliphatic polyester ?
17. What are the major uses of titanium dioxide ?
18. Explain briefly the difference between the generic and trade names of drugs with the help of one example.

**Turn over**

19. What is the basic functional use of pasteurization ?
20. Name two commonly used food preservatives.
21. How is cetane number calculated ?
22. What do you mean by sunscreen protection factor (SPF) ?

(10 × 2 = 20 marks)

### Section C (Paragraph)

*Answer any five questions.*

*Each question carries 6 marks.*

23. Distinguish between the “bottom-up” and “top-down” methods of nanoscale synthesis of materials.
24. Explain the green synthesis of Ibuprofen.
25. Which are the four commonly mentioned types of non-covalent interactions ?
26. How ab initio methods differ from semi-empirical methods?
27. Explain the procedure adopted for manufacturing chlorine in TCC Ltd.
28. Explain the chemistry behind the preparation of  $\text{TiO}_2$  through the sulphate process.
29. Briefly explain about cryogenic liquid rocket propellants
30. Explain the various pharmacokinetic compartments, ADME, of a drug.

(5 × 6 = 30 marks)

### Section D (Essay)

*Answer any two questions.*

*Each question carries 10 marks.*

31. Write notes on :
  - (i) Rodenticides.
  - (ii) PAN.
  - (iii) Octane number of a fuel.
  - (iv) Health effects of soft drinks.
  - (v) Fullerenes.
32. (a) How soap is functionally and chemically different from detergent ?  
(b) Write short note on :
  - (i) Endosulfan.
  - (ii) Nomex.
33. Explain the preparation and uses of Rosaniline and Indigo.
34. Discuss the importance and advantages of :
  - (a) Microwave assisted organic synthesis.
  - (b) Biodegradable polymers.

(2 × 10 = 20 marks)