B.Sc. DEGREE (C.B.C.S.S.) EXAMINATION, NOVEMBER 2013

First Semester

Core Course : METHODOLOGY OF CHEMISTRY AS A DISCIPLINE OF SCIENCE

(Common for B.Sc. Chemistry Model I, Model II and B.Sc. Petrochemicals and B.Sc. Chemistry–Environment and Water Management)

[2013 admissions]

Time : Three Hours   Maximum : 60 Marks

Part A

Answer all questions.
Each question carries 1 mark.

1. Mathematical expression of First law of Faradays Electrolysis is ——————.

2. For Titration between Sodium hydroxide and Oxalic acid —————— is used as indicator.

3. Molarity is defined as ——————.

4. A standard solution is one whose ——————.

5. One indicator used in EDTA titration is ——————.

6. Fine spectra of Hydrogen cannot be explained by —————— model of atom.

7. Modern periodic law is defined as the Physical and Chemical properties of elements are ——————.

8. Soap is chemically ——————.

$(8 \times 1 = 8)$

Part B

Answer any six questions.
Each question carries 2 marks.

9. What are the necessary requirements for a primary standard ? Give *one* example of primary standard.

10. Define the terms :

    (i) Molality.

    (ii) Mole.

11. Differentiate between preparation, synthesis and manufacture.

12. What is a Homologous series, explain ?

13. What is significant digit explain ?

14. Discuss solvent extraction.

15. What is Nanotechnology ? Mention some of its applications.

16. Distinguish between, Inductive and Deductive reasoning.

17. Discuss shortly on pH indicators and acid base titrations.

18. Explain the following :

    (i)   Scientific statements.

    (ii) Falsification of Hypothesis.

$(6 \times 2 = 12)$

Part C

Answer any **four** *questions.*
Each question carries 4 marks.

19. State and explain solubility product. How is it applied in Qualitative cation analysis. Discuss.

20. How could you consider Chemistry as a Central Science connecting other branches of science, explain ?

21. Explain Bohr model of atom. Discuss its drawbacks.

22. State and explain Faraday's laws of electrolysis.

23. Write a short note on :

Linear regression analysis.

24. Differentiate between Precision and Accuracy.

$(4 \times 4 = 16)$

Part D

Answer any **two** *questions.*
Each question carries 12 marks.

25. (a) Write a short note on :

Quantum Mechanical Model of atom.   (4)

    (b) Discuss the role of chemical science in the service of man in any *four* fields.   (8)

26. Write a brief account of various steps involved in science research.   (12)

27. (a) What are the different types of Errors ? How can Errors be minimised ? (9)

(b) Explain Laws of chemical composition. (3)

28. (a) Discuss the steps and principles involved in the Gravimetric estimation of Barium.

(8)

(b) Write briefly on EDTA titrations. (4)

[2 × 12 = 24]