B.Sc. DEGREE (C.B.C.S.S.) EXAMINATION, OCTOBER 2016

Third Semester

Complementary Course—ADVANCED PHYSICAL CHEMISTRY—I

(For Students who have opted Physical Science and Geology as main)

[2013 Admission onwards]

Time : Three Hours   Maximum : 60 Marks

Part A

Answer all questions.

Each question carries 1 mark.

1. Define Centre of symmetry.

2. What do you mean by molecular point group, explain ?

3. What are surfactants ? Give *one* example.

4. Define unit cell of a crystal.

5. What is packing fraction ?

6. What do you mean by the term critical mass ? Explain.

7. Define Eutectic point.

8. What are Colloides ?

                                                        $(8 \times 1 = 8)$

Part B

Answer any six questions.

Each question carries 2 marks.

9. What is Rock dating ? How is it done ?

10. Define Binding energy. How is it related to nuclear stability ?

11. What is Induced Radioactivity ? Give one example with equation involved.

12. Explain Electro-osmosis.

13. Explain the terms (i) Weiss indices ; (ii) Miller indices.

14. What are the limitations of Langmuir adsorption isomerism ?

15. What is N/P ratio ? How is it related to Nuclear stability ? Explain.

Turn over

16. What is Brownian movement ? Explain.

17. What do you mean by Adsorption Isotherm ? Write mathematical equation of Freundlich adsorption isotherm and explain the terms.

18. Explain the following (i) Lattice energy ; (ii) Conductors.

$(6 \times 2 = 12)$

Part C

Answer any four questions.
Each question carries 4 marks.

19. What are liquid crystals ? How are they classified ? Discuss their structures. Give examples for each type.

20. How will you determine the structure of NaCl by X-ray diffraction ?

21. What is Neutron activation analysis ? Discuss its applications.

22. Draw the phase diagram of water system and discuss. Explain Triple point.

23. Discuss Band theory of metallic bond. Explain how it can be used to discuss the properties of metals.

24. Write the Mathematical expression of phase rule and explain the terms involved in it.

$(4 \times 4 = 16)$

Part D

Answer any two questions.
Each question carries 12 marks.

25. (a) How are magnetic properties classified ? Discuss all types with examples.

    (b) Describe one method each for the preparation of (i) Colloidal gold ; (ii) Ferric hydroxide sol.

    (c) Write briefly on Electrical and optical properties of colloids.

26. Write briefly on :

    (a) Conventional and Breeder reactors.

    (b) Electrophoresis.

    (c) Nuclear fusion reaction.

    (d) Carbon dating.

27. (a) Draw the phase diagram of Lead-silver system and discuss.

    (b) Discuss the applications of Distribution Law.

    (c) Write a note on factors affecting adsorption.

28. Write a note on :

    (a) Nuclear wastes, its disposal and harmful effects.

    (b) Semiconductors and its applications.

    (c) Superconductors and its applications.

    (d) Permanent and temporary magnets.

$(2 \times 12 = 24)$