



**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**

**B.Sc. DEGREE EXAMINATION – MATHEMATICS & PHYSICS**

**FOURTH SEMESTER – APRIL 2015**

**CH 4206 - GENERAL CHEMISTRY FOR MATHS & PHYS. - II**

Date : 25/04/2015

Dept. No.

Max. : 100 Marks

Time : 09:00-12:00

**Part-A**

*Answer all questions. Each question carries two marks.*

*(10x2=20)*

1. State Faraday's law of electrolysis.
2. Define the radius ratio rule for ionic solids
3. Define enthalpy of neutralization.
4. What are anesthetics? Give examples.
5. Draw the furanose and pyranose structure of fructose.
6. What are indigo dyes? Give an example.
7. Mention any two properties of an enzyme.
8. What are the advantages of renewable energy resources?
9. Define unit cell.
10. How are Bordeaux mixtures prepared?

**Part-B**

*Answer any eight questions. Each question carries five marks.*

*(8x5=40)*

11. State Hess's law. Mention its applications.
12. How are solids classified?
13. How does conduction vary with concentration of an electrolyte?
14. Draw and explain the structure of sodium chloride.
15. Elucidate the structure of fructose.
16. Write the importance of hydrogen bonding and their types in detail.
17. How is malachite green prepared?
18. Explain the uses of broad spectrum antibiotics.
19. Explain the lock and key model of enzyme action.
20. Discuss the role of macronutrients.
21. Compare nuclear fission and fusion reactions.
22. What are auxochrome and chromophore? Give suitable examples.

### Part-C

Answer any four questions. Each question carries ten marks.

(4x10=40)

- 23a. What is Kohlrausch's law? Discuss any two of its applications. (5)
- b. Explain how the enthalpy of the reaction varies with temperature using Kirchhoff's equation. (5)
- 24a. Define lattice energy. (3)
- b. Consider an ionic compound  $\text{MX}_2$  where M is a metal that forms a cation of +2 charge and X is a nonmetal that forms an anion of -1 charge.
- $\text{M} + \text{X}_2 \longrightarrow \text{MX}_2$
- Draw the Born-Haber cycle for  $\text{MX}_2$  formation. Use the following energy values and calculate the lattice energy (in kJ/mol) for  $\text{MX}_2$ .  $\Delta H_{\text{sub}} = 296$  kJ/mol;  $\Delta H_{\text{f}} = -421$  kJ/mol; 1<sup>st</sup> ionization energy = 378 kJ/mol; 2<sup>nd</sup> ionization energy = 555 kJ/mol; bond dissociation energy = 310 kJ/mol; electron affinity = -427 kJ/mol. (7)
- 25a. Discuss the classification of dyes based on the mode of application. (7)
- b. Draw the structure of penicillin. (3)
- 26a. Discuss the Sanger's method of N-terminal analysis of protein. (5)
- b. Describe the secondary structure of proteins. (5)
- 27a. Explain in detail the non-renewable energy sources and their types. (6)
- b. Explain the process involved in the purification of petroleum. (4)
- 28a. Write a brief note on the types of soil. (5)
- b. Give the preparation of sulphanilamide and its uses. (5)

\*\*\*\*\*