THIRD SEMESTER B.Sc. DEGREE EXAMINATION, FEBRUARY 2023

(NEP-DSC)

CHEMISTRY

Time : Two Hours

Maximum : 60 Marks

All *sections are compulsory.*
Draw neat labelled diagrams and give equations wherever necessary.

Section A

I. Answer any *five* of the following. Each question carries 2 marks :

1 Define metallic bond.

2 How do you prepare benzene from acetylene ?

3 What is meant by internal energy ?

4 Differentiate between minerals and ores.

5 Define Nernst distribution law.

6 What is an alloy ? Give an example.

(5 × 2 = 10 marks)

Section B

II. Answer any *four* questions. Each question carries 5 marks :

7 Explain the consequences of hydrogen bonding with suitable example.

8 Explain the mechanism of Friedel crafts alkylation and give its limitations.

9 Derive an equation for hydrolysis constant, degree of hydrolysis and pH of solution o
a salt of weak acid and strong base.

10 Discuss the extraction of uranium form pitch blende ore.

11 What are SN^1 reactions ? Explain its mechanism with suitable example.

(4 × 5 = 20 mark

Section C

III. Answer any *three* questions. Each question carries 10 marks :

12 (a) Explain the diagonal relationship of Be and Al.   (5 mark

(b) Write a note on preparation methods and uses of diborane.   (5 mark

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Part C

*Answer any **three** of the following questions.*
Each question carries 10 marks.

12. On the basis of Lorentz transformations, derive expressions for (a) Length contraction ; (b) Time dilation.

(5 + 5 = 10 marks)

13. Determine the moment of inertia of a circular disc :

  (i) About an axis passing through its centre and perpendicular to its plane.

  (ii) About its diameter.

  (iii) About the tangent.

(5 + 3 + 2 = 10 marks)

14. Obtain an expression for couple per unit twist and work done for uniform cylindrical wire.

(7 + 3 = 10 marks)

15. Write the assumptions made in Poiseuille's equation. Derive Poiseuille's formula for the rate of flow of liquid through narrow tube.

(3 + 7 = 10 marks)

[3 × 10 = 30 marks]