F 8869 (Pages : 2) Reg. No.....

Name.....

M.Sc. DEGREE EXAMINATION, OCTOBER 2011

Third Semester

Faculty of Science

Branch III—Chemistry

Paper XI—PHYSICAL CHEMISTRY—III

Time : Three Hours Maximum : 75 Marks

Section A

Answer any ten *questions.*
Each question carries 2 *marks.*

1. How would you determine the standard energy of formation ?
2. Distinguish molar volume and partial molar volume.
3. Comment on the term chemical potential with suitable examples.
4. Explain point defects. How are they classified ?
5. What are Miller indices ? Explain.
6. What are liquid crystals ? Give *one* example.
7. Explain the term bioluminescence. Give *one* example.
8. What is quenching of fluorescence ?
9. What is quantum efficiency ? Explain.
10. What is membrane potential ? How it is developed ?
11. Draw a Tafel plot. Explain the significance of the slope and intercept of the plot.
12. What is flash desorption ? Explain.

(10 × 2 = 20 marks)

Section B

Answer any three *questions.*
Each question carries 5 *marks.*

13. Show that partial molar quantities are all intensive variables.
14. Discuss the application of liquid crystals.

Turn over

. Distinguish E type and P type phosphorescence.

. How will you determine the transference number from concentration cells ? Discuss.

. Discuss the light scattering method for the determination of molecular mass.

(3 × 5 = 15 marks)

Section C

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

. One mole of an ideal gas expands reversibly from a volume of 1 dm^3 to 3.2 dm^3 at 300 K. Calculate the change in entropy of the gas.

. What is scattering factor ? How does it influence XRD Pattern ? Explain.

. Briefly discuss on electrons and holes.

. Discuss the chemistry of photosynthesis.

. What is chemical corrosion ? Discuss the factors affecting chemical corrosion.

. Discuss Gibbs adsorption isotherm and its verification.

. Briefly discuss corrosion ? How is it classified ?

. Give a brief account of metal decomposition potential.

(5 × 4 = 20 marks)

Section D

Answer any two *questions.*
Each question carries 10 *marks.*

. Briefly discuss excess thermodynamic functions. How would you determine excess enthalpy and excess entropy ? What is the significance of the quantities ?

. Discuss imperfections in solids.

. Discuss the chemistry of photography.

. Discuss BET and Harkin-Jura isotherms for the determination of surface area.

(2 × 10 = 20 marks)