

**18U208**

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Name.....

Reg. No.....

**SECOND SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2019**

(Regular/ Supplementary/Improvement)

(CBCSS - UG)

**CC15U CHE2 C02 - PHYSICAL CHEMISTRY**

Chemistry - Complimentary Course

(2015 Admission onwards)

Time: 3 Hours

Maximum: 64 Marks

**Section - A**

Answer *all* questions. Each question carries 1 mark.

1. To which type Bravais lattice of NaCl belongs?
2. Write the equation for Boyle's law .....
3. Specific conductance of an electrolyte ..... with dilution.
4. The unit of viscosity in SI unit is .....
5. Write one example for basic buffer .....
6. For a spontaneous process  $\Delta G$  will be .....
7. Ideal gas equation is .....
8. Write the cell notation for calomel electrode .....
9. Bragg's equation is .....
10. Correction factor for pressure in Vander Waals equation is .....

**(10 x 1 = 10 Marks)**

**Section - B (Short Answer)**

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

11. Mathematically formulate first law of thermodynamics.
12. What is isotropy and anisotropy?
13. Define Kohlrausch's law.
14. The specific conductance of M/10 solution of KCl at 291K is 0.0112 S/cm and its resistance when contained in a conductivity cell is found to be 55 ohms. Calculate the cell constant.
15. What is single electrode potential? Give an example.
16. Define RMS Velocity and Most probable velocity with expression.
17. Define colligative properties.
18. Calculate the value of work done when 5g of O<sub>2</sub> expands from a volume of 2 litre to a volume 10 litre at room temperature.
19. What is the condition for equilibrium and spontaneity?
20. Define Ostwald's dilution law.

**(7 x 2 = 14 Marks)**

**Section - C (Paragraph)**

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

21. Explain H<sub>2</sub>-O<sub>2</sub> fuel cell.
22. Derive the relationship between temperature and pressure for an adiabatic process.
23. Define types of liquid crystals with examples.
24. What is Henderson equation? Explain with example.
25. What are real gases and how they deviate from ideal behaviour?
26. What is a reference electrode? Explain with example.

**(4 x 5 = 20 Marks)**

**Section - D (Essay)**

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

27. a) What are the applications of conductance measurements?  
b) The molar conductance at infinite dilution for potassium acetate, hydrochloric acid and potassium chloride are 95.6, 379.4 and 130.1 Scm<sup>2</sup>/mol respectively at 298K. Calculate the molar conductance at infinite dilution of acetic acid at 298K.

**(7 + 3 Marks)**

28. a) Define osmotic pressure with expression. What are the laws governing osmotic pressure?  
b) How molecular mass of polymer can be measured using osmotic pressure?
29. Explain Joule-Thomson effect and Linde's method of liquefaction of gases.
30. a) Derive the Nernst equation for single electrode potential and explain the terms involved.  
b) What are the significances of Gibbs-Helmholtz equation?

**(6 + 4 Marks)**

**(2 x 10 = 20 Marks)**

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