

Roll No.....

Total No. of Printed Pages: 1

Total No. of Questions: [09]

B.Sc. (Non-Medical) (Semester – 4th)
PHYSICAL CHEMISTRY-III
Subject Code: BSNMS1-404
Paper ID: [22131421]

Time: 03 Hours

Maximum Marks: 60

Instruction for candidates:

1. Section A is compulsory. It consists of 10 parts of two marks each.
2. Section B consist of 5 questions of 5 marks each. The student has to attempt any 4 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

Section – A

(2 marks each)

Q1. Attempt the following:

- a. Define Ostwald dilution law.
- b. What do you mean by equivalent conductance? How is equivalent conductance related to specific conductance?
- c. Explain the term transport number. How you can determine it?
- d. Define electrode potential and standard electrode potential of a metal.
- e. What do mean by buffer action?
- f. Distinguish between electrolytic and galvanic cells.
- g. What is the Soddy-Fajans Group Displacement Law?
- h. State general characteristics of radioactive decay.
- i. What do you mean by artificial radioactivity? Mention its two applications.
- j. State Born-Oppenheimer approximation.

Section – B

(5 marks each)

- Q2. Explain Kohlrausch law. For strong electrolyte NaOH, NaCl and BaCl₂, the molar ionic conductance at infinite dilution are 248.1×10^{-4} , 126.5×10^{-4} and 280.0×10^{-4} S m² mol⁻¹, respectively. Calculate Λ°_m for Ba(OH)₂.
- Q3. Derive the Nernst equation? How is it utilized in determining cell electromotive force (EMF)?
- Q4. Discuss the different types of nuclear decay processes with the help of suitable examples.
- Q5. Give an overview of various nuclear models used to describe atomic nuclei.
- Q6. With the help of a suitable schematics, explain basic features of a spectrophotometer.

Section – C

(10 marks each)

- Q7. Write a note on Debye-Huckel-Onsager's equation for strong electrolytes.
- Q8. Discuss in details the phenomenon of hydrolysis of salts. Illustrate your answer by taking example of strong acid and weak base.
- Q9. Draw molecular orbital energy level diagram for O₂ and workout the bond order and magnetic properties of O₂.