

B. Sc. DEGREE END SEMESTER EXAMINATION - MARCH 2018**SEMESTER – 6: CHEMISTRY (CORE COURSE)****COURSE: 15U6CRCHE12: PHYSICAL CHEMISTRY - IV***(For Regular - 2015 Admission)*

Time: Three Hours

Max. Marks: 60

SECTION AAnswer **all** questions. Each question carries **1** mark

1. The p^H of 0.0001M HCl is -----
2. A solution in which H^+ ion concentration is greater than ----- is an acidic solution.
3. The expression for the solubility product of mercurous iodide is-----
4. The charge on one mole of electrons is called -----
5. Give the equation that shows the variation of electrode potential with the concentration of the electrolyte.
6. The electrode where the oxidation takes place in a Galvanic cell is known as -----
7. ESR in spectroscopy stands for
8. What is the use of a polarimeter? (1 x 8 = 8)

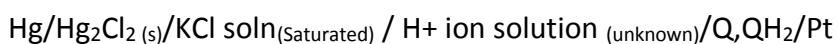
SECTION BAnswer **any Six** questions. Each question carries **2** marks

9. What are conjugate acid – base pairs? Illustrate.
10. Why different salts form different types of solutions in water?
11. How do the molar conductance of strong and weak electrolytes vary with dilution?
12. Comment on the abnormal conductivities of hydrogen and hydroxyl ions.
13. A molar solution of ethanoic acid conducts electricity but not so easily as molar solution of hydrochloric acid. Explain?
14. emf of a concentration cell gradually decreases. Why?
15. What is meant by single electrode potential. Why is the reduction potential of copper electrode is taken as positive?
16. What are the functions of a salt bridge? (2 x 6 = 12)

SECTION CAnswer **any Four** questions. Each question carries **5** marks

17. Explain the action of the acid-base indicator phenolphthalein.
18. Explain Walden's Rule. Give its limitations.
19. State Kohlrausch law. Give one application.
20. Briefly explain hydrogen- oxygen fuel cell.

21. The quinhydrone electrode was used in conjunction with a saturated calomel electrode as shown below:



At 25 °C , the emf of this cell was found to be 0.25 volt. Calculate the pH of the unknown solution at 25°C. Given that at 25 °C

$$E^\circ_{(\text{H}^+, \text{Q}, \text{QH}_2)} = 0.6996 \text{ volt and } E_{\text{Cal}(\text{saturated})} = 0.2415 \text{ volt}$$

22. 'Daniell cell is said to be a reversible cell'. Account for the statement. (5 x 4 = 20)

SECTION D

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

23. Explain the following

- Buffer solutions
- Types of buffers
- Buffer action
- Buffer capacity
- Buffer range

24. What is meant by transport number? How is it determined by moving boundary method.

25. a) Give the electrochemical theory of rusting of iron.

b) How can the solubility product of a sparingly soluble salt be determined by emf measurements.

26. Explain

- Nuclear paramagnetism
- Chemical shift and
- Electron spin resonance

(10 x 2 = 20)
