

KHYBER PAKHTOON KHWA. PUBLIC SERVICE COMMISSION PESHAWAR

Subject: - Competitive Examination for the Posts of Provincial Management Service (BPS-17), 2010

CHEMISTRY PAPER-I

Time Allowed: 03 hours

Max. Marks: 100

Note: Attempt any **five** questions. All questions carry equal marks.

- Q.1 A) Describe the Concept of **Quantum Theory** of Radiation. What properties of radiations does it explain? 15
- B) What is the difference between structures of H-atom, H-molecule and H-molecule ion? 05
- Q.2 A) State the 2nd **Law** of Thermodynamics. How is it related to **Entropy**? Explain with the help of equations. 14
- B) Explain the terms: i) **Intensive Properties**, ii) **Extensive Properties**, iii) **State** 06
- Q.3 A) What is **Electrolysis**? Describe Faraday's Laws Electrolysis and explain with examples. Also give significance of these Laws. 15
- B) How measurement of pH is made? 05
- Q.4 A) What is the group No. and Atomic No. of **Nitrogen**? What is its importance in Air? 04
- B) Name typical **Oxy-acids** of Nitrogen. Describe the preparation, structure and important chemical reactions of **Nitric Acid**. 16
- Q.5 A) Name important ores of **aluminum**. Describe methods of preparation and purification of Aluminum. 14
- B) What is a **Semi-conductivity device**? Discuss basic design of n-type and p-type Semi-conductivity devices. 06
- Q.6 How the structures of **Coordination Compounds** are explained on the basis of Molecular Orbital Theory? Explain with respect to $[\text{Co}(\text{NH}_3)_6]^{3+}$ and $[\text{Co}(\text{F})_6]^{3-}$. Which one is paramagnetic? 20
- Q.7 A) What are **water borne diseases**? What remedial measures should be taken to minimize the risk of these diseases? 14
- B) Describe types of **water hardness**. Give names of compounds that are responsible for these types. 06