

KHYBER PAKHTUNKHWA, PUBLIC SERVICE COMMISSION

COMPETITIVE EXAMINATION FOR THE POSTS OF PROVINCIAL MANAGEMENT SERVICES (BPS-17).

2016

CHEMISTRY PAPER-I

TIME ALLOWED: 03 HOURS

MAX: MARKS: 100

NOTE:- ATTEMPT ANY FIVE QUESTIONS: ALL QUESTIONS CARRY EQUAL MARKS.

- Q1. A. State and Explain First Law of Thermodynamics. 12
 B. Define and explain the following Terms. 12
 a) Enthalpy of a system b) Entropy of a system c) Heat Capacity 8.
- Q2. A. Describe Colligative Properties of Electrolytes. 6
 B. Briefly Explain Faraday's First & Second Law of Electrolysis with Examples 14
- Q3. A. Describe the general Characteristic Properties of Transition Elements. 8
 B. Making use of Valence Bond Theory and Crystal Field theory; Explain the Structure & Bonding in complex ions or Compounds - illustrate with e.g's 12.
- Q4. A. State the Pauli's Exclusion Principle. Would any of the following electronic Configuration violate this rule i) $1s^2$ ii) $1s^2 2p^7$ iii) $1s^3$ - explain also. 8
 B. What is a quantum number? How many quantum numbers are required to specify a single atomic orbital? What are they? 12.
- Q5. A. Explain basic metallurgical processes or steps that are generally required for extraction of metal from its ore, and converting the metal to a useful form 12.
 B. Briefly describe the Extraction method of Copper. 8.
- Q6. Write a note on Air-Pollution. (20)
- Q7. A. Name common oxides and oxy acids of Sulphur; Draw the electronic structure of HSO_3^- , SO_3^{2-} , N_2O_4 , NO_2 , NO_2^- . 10.
 B. Describe the Preparation of HNO_3 10.
- Q8. What are the basic Raw-Materials used for i. Ceramic and ii glass Industry? Describe the type and Characteristics of these raw materials. (20)