University of Dhaka
Affiliated Engineering Colleges
Department of Computer Science and Engineering
1st Year 1st Semester B.Sc. Examination, 2020
CHEM – 1104, Chemistry

Total Marks: 70 Time: 2 Hours

(Answer any 3 (Five) of the following Questions)

1. a) Describe the postulates of Bohr's atomic model. 5
   b) What is quantum number? Why four quantum numbers are required to explain the position of an atom? 7
   c) What is meant by Pauli's exclusion principle? Explain with example. 4
   d) Explain why the aqueous solution of $CuSO_4$ is acidic in nature. 3
   e) Write down the application of radioactive isotopes. 4.33

2. a) Explain the position of Hydrogen in the periodic table. 6
   b) State and explain the Hess's Law of Constant Heat Summation. 6
   c) Write the electronic configuration of following atom and ions 5
      Cu , S^{2-} and Fe^{2+}
   d) Calculate the P^H of a 0.1 M NaOH solution. 3
   e) Why are Noble gases chemically inert? 3.33

3. a) What do you understand by the rate of a chemical reaction? Give mathematical expression of reaction rate. 5
   b) What is meant by first order reaction? Show that half life period of a first order reaction is independent of initial concentration. 6
   c) Define homogeneous and heterogeneous catalyst giving one example of each. 5
   d) What do you understand by activation energy of a chemical reaction? 4
   e) At 298K temperature in case of decomposition of N_2O_4 K_P is 0.008 atm. Find K_C for that reaction. 3.33

4. a) Describe the ionic character of covalent bond. 7
   b) Explain the followings: 6
      i) PCl_5 exists but NCl_5 does not.
      ii) NH_3 is a trigonal pyramidal molecule.
   c) Why chemical bond is formed? 5
   d) Explain SP^2 hybridization with example. 5.33

5. Write Short notes on the followings:
   i) Heisenberg's Uncertainty Principle 4
   ii) Hund's Rule 3
   iii) Diagonal Relationship 3
   iv) Hess's law of heat summation. 3
   v) Chemical and Nuclear reaction 4
   vi) Enthalpy 3
   vii) Colligative properties 3.33