Mid-West University

Examinations Management Office

End-Semester Examinations -2080

Bachelor level / B.E. Civil / 2nd Semester — Full Marks: 50
Time: 3 hours — Pass Marks: 25
Subject: Engineering Chemistry (SH422/SH106)

- *Attempt all the questions*
- *Figures in the margin indicate full marks.*
- *Assume suitable values, with a stipulation, if necessary.*
- *Candidates are required to answer the questions in their own words as far as possible.*

1. Mention the postulates of Bohr's Atomic Theory and also point out its success. **(4+1)**
2. Define standard electrode potential. Draw a neat and clean diagram of a galvanic cell formed by combination of zinc and copper electrodes. Also mention the cell reaction and calculate the emf of the cell. **[Given, $E°_{Zn^{++}/Zn} = -0.76V$, $E°_{Cu^{++}/Cu} = +0.34V$] (1+2+2)**
3. What is meant by induced catalysis? Describe the mechanism of intermediate compound formation theory of catalysis with suitable examples. **(1+4)**
4. What is water pollution? Point out the major sources of water pollution, also write their adverse effects and possible remedies. **(1+4)**
5. Define polymers. Give the preparation and application of Nylon 6,6 and Teflon. **(1+2+2)**
6. What do you mean by transition element? TiO_2 is white and TiO_3 is violet. Why? Show your acquaintance with applications of 3d-transition elements. **(1+2+2)**
7. What are the inner and outer orbital complexes? Explain the geometry and magnetic properties of $[Fe(CN)_6]^{3-}$ on the basis of valence bond theory. **(2+3)**
8. a) Give the types of explosives. Also, write the preparation and application of Trinitrotoluene (TNT). **(1+2)**
   b) Discuss the two different types of paints indicating their application in engineering works. **(2)**
9. Differentiate Cis and Trans isomers with examples. Write the properties of enantiomers. **(3+2)**
10. What is nucleophilic substitution reaction? Differentiate between SN1 and SN2 reactions in alkyl halides showing their mechanisms. **(1+4)**

The End