

Mid-West University  
**Examinations Management Office**  
End Semester Examinations 2081

Bachelor level/ B.E. Computer/ 1<sup>st</sup> Semester  
Time: 3 hours  
Subject: Engineering Chemistry (SH412/SH502)

Full Marks: 50  
Pass Marks: 25

- *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. What is buffer solution? Derive Henderson's equation to calculate the  $p^H$  of acidic buffer solution. (2+4)
  2. What is catalyst? Mention its types. Write down industrial applications of catalyst. (1+1+3)
  3. Define air pollution. Write the photochemistry of ozone layer depletion showing the reaction mechanism. (2+4)
  4. What do you mean by polymerization? Write its types. Give the preparation and application of Polystyrene, PVC, Teflon, Nylon 6,6 and Bakelite. (2+1+5)
  5. What do you mean by transition element? Why does transition element show variable oxidation state and magnetic property? (2+4)
  6. What are the postulates of valence bond theory (VBT)? Explain the geometry of  $[FeCl_4]^{2-}$  on the basis of valence bond theory. (2+3)
  7. What are explosives? Give the preparation and application of Trinitroglycerine (TNG). (1+2)
  8. Write down the function of lubricants? (2)
  9. Why is trans isomer more stable than cis isomer? Explain the E and Z concept of geometric isomerism with examples. (2+3)
  10. What is nucleophilic substitution reaction? Explain in detail the  $SN_1$  reaction. (1+3)

**The End**