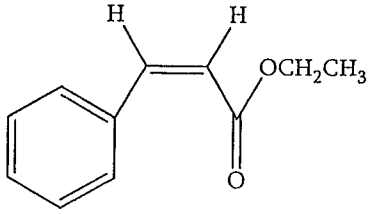
Uva Wellassa University, Sri Lanka
End Semester Examination – June 2009
CHE 361-1 Advanced Organic Chemistry

Time: One (01) hour

Total six (06) Questions
Question three (03) is compulsory
Answer one (01) question from Part A and three (03) questions from Part B

Part A

1. Consider the *compound A* given bellow



compound A

I. Sketch the ^{1}H-NMR spectrum of the *compound A.*
II. Sketch the ^{13}C-NMR spectrum of the *compound A.*
III. Account for the peaks observed at m/z 131, 103 and 77 in the mass spectrum of the *compound A.*

(50 marks)

2. *Compound B* ($C_6H_{12}O$) has following spectral data: IR $\sqrt{}_{max}$ 1715 cm^{-1}, ^{1}H-NMR δ_{ppm} 2.35 (t, 2H), 2.02 (s, 3H), 1.54 (m, 2H), 1.24 (m, 2H) and 0.75 (t, 3H), MS m/z 85 and 43. Deduce the structure of the *compound B.*

(50 marks)

Part B

3. Giving reactions, illustrate the three steps of chain growth polymerization (initiation, propagation, termination), using ethane as the monomer molecule. (20 marks)

4. I. What is Vulcanization?
II. Explain benefits of Vulcanization? (15 marks)

5. I. What constituents of gasoline are responsible for the octane number?
II. Why high octane gasoline (petrol) is recommended over low octane gasoline for automobiles? (15 marks)

6. I. What are surfactants?
II. Briefly explain the structure of a typical surfactant molecule (15 marks)