EASTERN UNIVERSITY, SRI LANKA
SECOND EXAMINATION IN SCIENCE (2003/2004)
EXTERNAL DEGREE
SECOND SEMESTER (OCT/NOV 2007)
EXTCH 205 BORON CHEMISTRY AND SILICATES

Time: 01 Hour
Answer All Questions

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1. (a) (i) Classify, giving reasons, the following boranes /carboranes into their structural groups.

   (I) $B_3H_8^-$ (II) $[B_5H_5]^{2-}$ (III) $C_2B_3H_5$

   (ii) Sketch their predicted geometry
   (iii) Discuss the nature of bonding in them

   (b) How can the following transformation be effected through organometallic intermediate?

   $CH_3CH{=}CH_2 \longrightarrow CH_3CH_2CH_2OH$

   (c) Draw the 'styx' number for B_2H_6

2. (a) (i) List the structural types of silicates
   (ii) Classify the following silicates into their structural types.

   I. $Ca_2Mg_5(Si_4O_{11})_2$ (Tremolite)
   II. $Be_3Al_2Si_6O_{18}$ (Beryl)
   III. $Mg_3(OH)_2Si_4O_{10}$ (Talc)
   IV. Be_2SiO_4 (Phenacite)

   (b) Show by means of equations how the following transformations could be effected via organometallic intermediates.

   (i) $(BNHCl)_3 \longrightarrow B_3N_3H_6$
   (ii) $B_3N_3H_6 \longrightarrow BNH(NHR)_3$

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