

(03marks)

4. a) What is meant by the term ideal solution?

b) Ethanol and butanol are liquids that form an ideal solution. The data below shows the mole fraction butanol in the liquid and vapour phases varying with temperature for ethanol – butanol system

Boiling point (°C)		117	110	100	90	85	78.5
Mole fraction of butanol (%)	liquid	100	90	66	40	22	0
	vapour	100	70	40	18	10	0

- (i) On the same axes plot a graph of boiling point against percentage of butanol in both liquid and vapour phases and label your graph completely. (05marks)
- (ii) Explain the shape of the graph. (04marks)
- (iii) Describe how a liquid mixture containing 45% ethanol is fractionally distilled. (04marks)

- c) . (i) State Raoult's Law as applied to miscible. (01mark)
- (ii) Explain why some liquid mixtures do not obey Raoult's law. (03marks)