NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF APPLIED CHEMISTRY
BACHELOR OF SCIENCE HONOURS DEGREE
SUPPLEMENTARY EXAMINATIONS – AUGUST 2013
CHROMATOGRAPHIC SEPARATIONS – SCH 4292
TIME: 3 HOURS

INSTRUCTIONS TO CANDIDATES
Answer **ANY FOUR (4)** questions out of **FIVE (5)** questions provided.
Each question carries 25 marks.

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1. Compound A migrates 7.6cm from its point of application on a thin-layer chromatographic plate, whereas in the same time the solvent front migrates 16.2cm beyond the point of sample application.

   (i) Calculate R_f for compound A. [8 marks]

   (ii) On an identical plate, the solvent front has moved 14.3cm beyond the point of sample application; where should compound A be located on this plate? [7 marks]

   b) Explain how chromatographic zones are detected in HPLC. [10 marks]

2. (a) With the aid of a diagram explain the following terms as used in chromatography.

   (i) column resolution [5 marks]
   (ii) Plate Height [5 marks]

   (b) Explain in detail how chromatography is used to quantify components of a mixture. [15 marks]

3. (a) What is temperature programming as used in gas chromatography? [10 marks]

   (b) What are the advantages of fused silica capillary columns compared with glass or metal columns. [15 marks]

4. (a) What is meant by the linear response range of a detector? [5 marks]

   (b) What is Thin Layer Chromatography (TLC)? Explain how it can be applied to separate and quantify components of a mixture. [15 marks]

(c) What are the desirable characteristics of HPLC detector? [5 marks]

5. (a) Explain why pH affects the separation of amino acids by electrophoreses. [10 marks]

(b) Give an example of the application of electrophoresis. [10 marks]

(c) Describe the effect of pressure on super critical fluid chromatograms. [5 marks]

END OF QUESTION PAPER!!!