



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF APPLIED CHEMISTRY
BACHELOR OF SCIENCE HONOURS DEGREE
SUPPLEMENTARY EXAMINATIONS – AUGUST 2013
INDUSTRIAL ORGANIC CHEMISTRY I – SCH 2215
TIME: 3 HOURS

Instructions to candidates

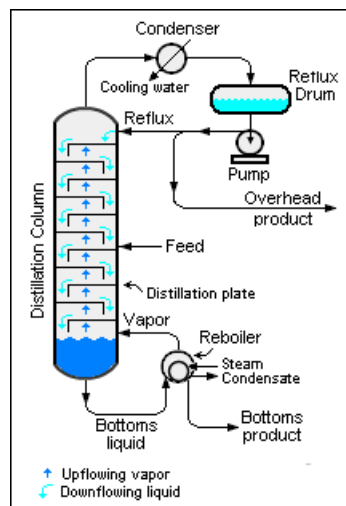
Answer any Four (4) Questions from the Five (5) provided. Each question carries 25 marks.

Start your answers to each question on a new page.

1.
 - a) Draw sketch diagrams for the Hollander beater and cone refiner (6 marks)
 - b) Explain the difference in operation of the two machines (4 marks)
 - c) Compare and contrast five (5) operating conditions of the beehive coke oven and the Otto Hoffmann's oven. (10 marks)
 - d) List five wood extractives and their uses (5 marks)

2. Compare and contrast the manufacturing processes of the following explosives
 - a) Nitroglycerine
 - b) PETN
 - c) TNT
 - d) RDX
 - e) HMX(25 marks)

3. The following is a diagram of a typical industrial distillation tower



- a) Use this diagram as a reference for construction of your own labeled diagram of a coal tar distiller. (10 marks)

- b) What are the uses of the products from your coal tar distiller? (8 marks)
- c) Suggest two methods for quenching metallurgical coke from the coke oven explaining how each method has an impact on the quality of the produced coke. (7 marks)
4. a) Draw the process-flow chart for liquor fortification in the sulphite pulping process. (8 marks)
- b) What environmental pollution can you expect from a sulphite pulping plant? Suggest ways of dealing with the pollution. (6 marks)
- c) Name two uses of rosin. (2 marks)
- d) Write down three chemical reaction equations during the sulphate pulping process. (6 marks)
- e) Name three process control variables in the sulphite pulping reactor. (3 marks)
5. a) Draw a schematic diagram of the nitrator used in the manufacture of nitrocellulose (4 marks)
- b) Explain three functions of sulphuric acid in the nitration process (use reaction equations) (6 marks)
- c) Describe the benzene acid washing process. What process conditions influence the efficiency of the process? Discuss. (12 marks)
- d) Name three uses of turpentine. (3 marks)

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