



(University of Choice)

**MASINDE MULIRO UNIVERSITY OF  
SCIENCE AND TECHNOLOGY  
(MMUST)**

**MAIN CAMPUS**

**SPECIAL/SUPPLEMENTARY EXAMINATIONS**

**2021/2022 ACADEMIC YEAR**

**FOURTH YEAR SECOND SEMESTER EXAMINATIONS**

**FOR THE DEGREE**

**OF**

**BACHELOR OF SCIENCE (CHEMISTRY, INDUSTRIAL  
CHEMISTRY)**

**COURSE CODE: SCH 400**

**COURSE TITLE: INDUSTRIAL CHEMISTRY**

**DATE: 01/08/2022**

**TIME: 8.00-10.00 AM**

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INSTRUCTIONS TO CANDIDATES

Attempt all questions

TIME: 2 Hours

MMUST observes ZERO tolerance to examination cheating

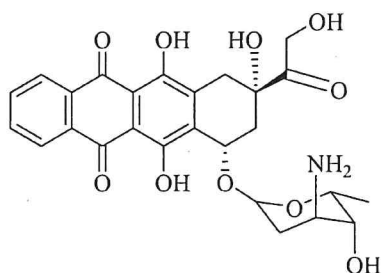
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**Question One****(17 marks)**

- a) Define the following terms in relation to Industrial Chemistry **(3 marks)**
- Coking
  - Desalting
  - Oligomer
- b) Explain the three categories of Crude oil refinery processes **(6 marks)**
- c) Describe the fractions obtained by vacuum distillation of the residuum obtained from atmospheric distillation unit **(3 marks)**
- d) List three advantages of hydrotreating a petroleum feedstock **(3 marks)**
- e) Distinguish between a Petrochemical industry and an oil industry **(2 marks)**

**Question Two****(18 marks)****marks)**

- a) Some dyes give colors of higher intensity compared to others. Explain **(2 marks)**
- b) Naphthalene-1-sulphonic acid is an intermediate used in the manufacture of synthetic dyes
- By use of a chemical equation, show how the intermediate is obtained from naphthalene. **(2 marks)**
  - Briefly describe steps followed in manufacturing a dye after obtaining the intermediate in (i) above **(3 marks)**
  - List any three measures for prevention and control of pollution from a dye industry **(3 marks)**
- c) Doxorubicin whose structure is given below is an anticancer drug first isolated from *Streptomyces peucetius* bacterium. Describe two possible processes of its bulk manufacture for commercialization for its clinical use. **(4 marks)**



- d) Describe four (4) mechanical properties to consider while manufacturing commercial polymers (4 marks)

**Question Three (20 marks)**

- a) Explain any three industrial application of inorganic compounds (3 marks)
- b) State and explain three main differences between inorganic and organic compounds(3marks)
- c) Briefly explain the best extraction method for titanium metal from its ore (4 marks)
- d) State and explain any three economic factors that must be considered when choosing a method of reduction for a particular ore. (3 marks)
- e) Use example to explain the main steps of heterogenous catalysis (7 marks)

**Question Four (15 marks)**

- a) Refining of metal is a key step in metal extraction. Discuss the main methods used in metal refinery (5 marks)
- b) Explain why the understanding of the reactivity series of metals is important while performing metal extraction? (3 marks)
- c) Catalysts are broadly divided into homogeneous and heterogeneous catalysts. Juxtapose the two types of catalysts in terms of their operations. (3 marks)
- d) How would one
- e) Identify any two industrial products of your choice and explain how catalysts play a role in their processing (4 marks)