



RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B.Sc. in Applied Sciences
Third Year - Semester II Examination – January / February 2023

CHE 3213 – INDUSTRIAL CHEMISTRY

Time: Two (02) hours

Answer all questions

1.
 - a) Briefly describe the two theories on the origin of formation of crude oil.
(25 marks)
 - b) Identify the term refining of petroleum and write a short note on six main classes of refinery products and their uses.
(50 marks)
 - c) Explain primary and secondary migrations related to the movement of petroleum from source reservoir rock.
(25 marks)
2.
 - a) Differentiate the two terms (i) catalytic cracking and (ii) thermal cracking and write down the advantages of catalytic cracking.
(50 marks)
 - b)
 - i. Write down the main three hydrocarbons that define the characters of petroleum
 - ii. Discuss the three main types of crude oil.
(25 marks)
 - c) State the application of the following spectroscopic techniques in identification of petroleum feedstock and products.
 - i. Mass spectroscopy
 - ii. Nuclear magnetic resonance spectroscopy
 - iii. Ultraviolet spectroscopy
 - iv. X-ray fluorescence spectroscopy
(25 marks)

3.

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a) Discuss modern techniques for exploration of crude reservation.

(25 marks)

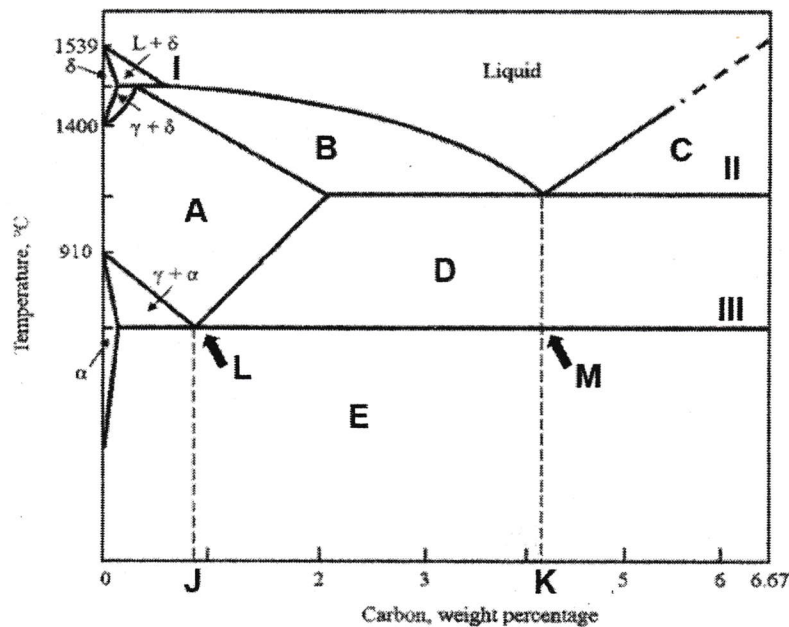
b) State the five common characteristics of carbon black and discuss its typical applications..

(25 marks)

c) Including subclasses, discuss hot and cold work tool steels.

(50 marks)

4. Given below is the Fe-Fe₃C phase diagram



a) Label the different regions (A-E) in the diagram with the appropriate terms Austenite, Ferrite, Cementite and Pearlite. Identify the points J, K, L and M?

(50 marks)

b) According to the label I, II, and III identify the three different invariant reactions occurred at the relevant temperature.

(25 marks)

c) Discuss three types of stainless steels with chemical composition.

(25 marks)

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