

BOWEN UNIVERSITY, IWO OSUN STATE  
COLLEGE OF AGRICULTURE, ENGINEERING AND SCIENCE  
INDUSTRIAL CHEMISTRY PROGRAMME  
2022/2023 B.SC DEGREE SECOND SEMESTER EXAMINATION

Course code: CHM 304    Course Title: Chemistry Practical IV    Credit: 1

Date: 20/06/2023

Time allowed: 1 hour

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**INSTRUCTIONS:**

- I. Answer All Questions (Total mark is 40)
  - II. Start to answer each question on a fresh page
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**QUESTION ONE**

- a. Define the following terms and give their units where **applicable**
  - I. Acidity (2 Marks)
  - II. Rancidity (2 Marks)
  - III. Peroxide Value (2 Marks)
  - IV. Saponification Value (2 Marks)
- b. (i) Given the following data, describe an experiment you would carry out to determine the acid value of an olive oil sample.
  - I. 10g of olive oil
  - II. Two 250 mL stoppered conical flasks
  - III. 50 mL of 95 % Ethanol
  - IV. 25 mL of 0.1N KOH
  - V. Phenolphthalein indicator (5 Marks)
- b. (ii) Calculate the acid value of the oil sample in b (i) above (2 Marks)

**QUESTION TWO**

- a.
  - I. Define Saponification (2 Marks)
  - II. Give the chemical reaction(s) involved in Saponification (3 Marks)
  - III. Mention any four (4) reagents and their specification(s) where **applicable**, you would use to carry out an experiment to determine the saponification value of palm oil. (4 Marks)

- b. Determine the peroxide value of an oil sample given the following data
- I. 20 mL of thiosulphate solution
  - II. 0.02 M of thiosulphate solution
  - III. 7.0 g of oil sample
- (2 Marks)
- c. Give one (1) analytical importance each of the following:
- I. Peroxide Value (1 Mark)
  - II. Saponification Value (1 Mark)
- d. Give the Chemical equation for the reaction that occurs in the determination of Peroxide number. (2 Marks)

### QUESTION THREE

- a. What do you understand by chromatographic technique? (2 Marks)
- b. Define the following terms and give two (2) examples each
- I. Mobile phase (3 Marks)
  - II. Stationary phase (3 Marks)
- c.
- I. What is Retention factor ( $R_f$ ) (1 Mark)
  - II. What is the analytical importance of c (I) above? (1 Mark)