



**KISII UNIVERSITY**  
**UNIVERSITY EXAMINATIONS**

**FOURTH YEAR EXAMINATION FOR THE AWARD OF**  
**THE DEGREE OF BACHELOR OF SCIENCE IN PETROLEUM CHEMISTRY**  
**SECOND SEMESTER 2021/2022**  
**(FEBRUARY-JUNE, 2022)**

**BSPC 421: CORROSION CHEMISTRY**

**STREAM: Y4 S2**

**TIME: 2 HOURS**

**DAY: WEDNESDAY, 9.00 AM – 11.00 AM**

**DATE: 11/05/2022**

**INSTRUCTIONS:**

- 1. Do not write anything on this question paper.***
- 2. Answer ALL Questions in Section A any other TWO Questions in Section. B***

**SECTION A: Answer all questions. (40Marks)**

- 1.a) Define the following terms; (2mks)
- Decarburization
  - Season cracking
- b) State the Pilling- Bed worth Rule as used in describing the nature of an oxide layer film formed during corrosion. (2marks)
- c) Briefly explain the four causes of corrosion. (8 marks)
- d) Differentiate the following; (6 marks)
- Caustic embrittlement and Hydrogen embrittlement
  - Stable film and Unstable film
  - Porous film and Volatile film
- e) Discuss five factors influencing corrosion. (10 marks)

- f) Describe the two processes that take place at the cathode during wet corrosion. (4 marks)
- g) How does water line corrosion occur and how is it prevented? (4 marks)
- h) Give the classification of soil corrosion. (4 marks)

**SECTION B: Answer any two questions**

- 2.a) Discuss four types of corrosion. (12marks)
- b) Consider rusting of iron under electrochemical corrosion, write the anodic, cathodic and overall equations for the formation of corrosion product. (3 marks)
- 3.a) Brief discuss the theories of corrosion, showing the mechanism in each case. (10 marks)
- b) Give five differences between electrochemical/wet and dry theories of corrosion. (5 marks)
- 4.a) Explain the four methods of corrosion control. (12 marks)
- b) Describe the meaning of 'liquid-metal corrosion.' (3 marks)