



**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAMINATION  
SEMESTER II  
SESSION 2023/2024**

- COURSE NAME : CONCRETE TECHNOLOGY
- COURSE CODE : BFS 40603
- PROGRAMME CODE : BFF
- EXAMINATION DATE : JULY 2024
- DURATION : 3 HOURS
- INSTRUCTIONS :
1. ANSWER ALL QUESTIONS
  2. THIS FINAL EXAMINATION IS CONDUCTED VIA
    - Open book
    - Closed book
  3. STUDENTS ARE **PROHIBITED** TO CONSULT THEIR OWN MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA CLOSED BOOK

THIS QUESTION PAPER CONSISTS OF **THREE (3)** PAGES

**TERBUKA**

**CONFIDENTIAL**

**Q1** Quality of concrete requires specific concrete mixes to meet the desired properties, such as strength, durability, workability, and appearance.

(a) List and elaborate **FIVE (5)** factors that affect the deterioration of concrete.

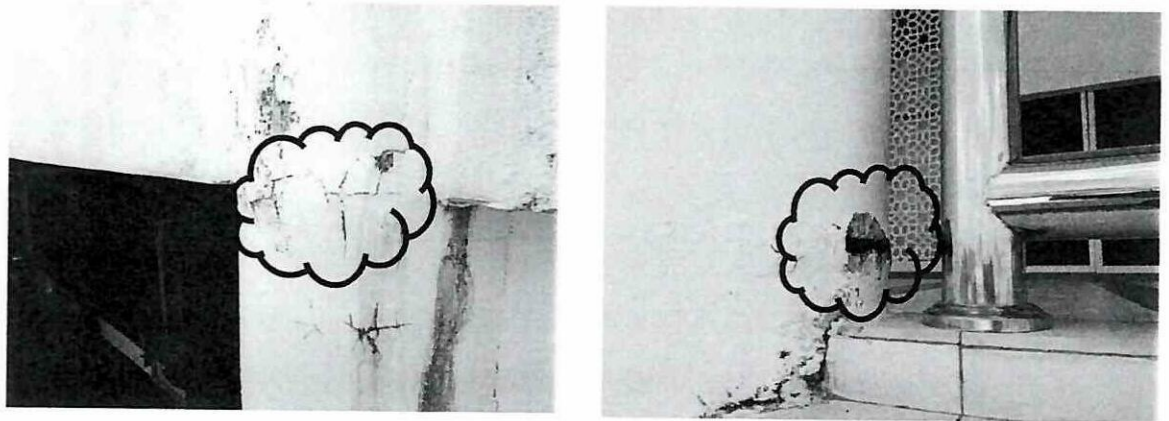
(10 marks)

(b) High permeability of concrete occurs from the propagation of micro-cracks. Describe **THREE (3)** factors contributing to the initial formation of micro-cracks in concrete structures.

(6 marks)

(c) Identify the concrete flaw shown in **Figure Q1.1**. Then, sketch the corrosion stage graph and describe the process of each stage.

(9 marks)



**Figure Q1.1** Concrete flaws

**Q2** Lightweight concrete offers several advantages although it is often more than normal concrete.

(a) State **FIVE (5)** elements that influence the thermal conductivity of lightweight concrete.

(5 marks)

(b) Discuss the differences between lightweight concrete and normal concrete. Propose suitable materials to produce lightweight concrete.

(10 marks)

(c) Elaborate on the advantages and application of lightweight concrete in construction.

(10 marks)

**TERBUKA**

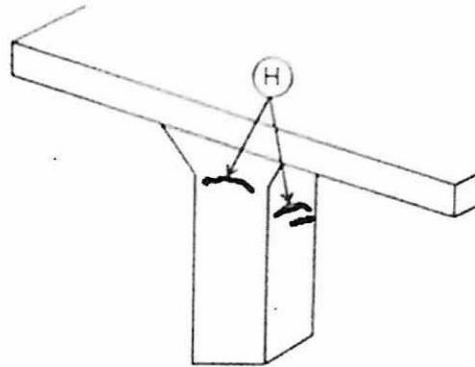
**Q3** Special concretes are prepared for a specific purpose like lightweight, high density, fire protection, radiation shielding and others. Concrete is a versatile material processing good compressive strength and durability.

(a) State and describe **THREE (3)** types of special concrete. (6 marks)

(b) Justify the advantages and effects by adding pozzolanic materials in special concrete. (9 marks)

(c) You read an article on fiber-reinforced concrete in an online construction magazine. From your reading, justify the use of fibre-reinforced concrete for shell roofs and small tunnels. Give the advantages of using fibre-reinforced concrete. (10 marks)

**Q4** A structure have a tendency to crack along it service life. There are various types of cracks occur in structures. **Figure Q4.1** show one of the crack patterns that appeared on the surface of a column.



**Figure Q4.1** Crack pattern on the surface of a column.

(a) Name the crack shown in **Figure Q4.1**. (3 marks)

(b) Clarify and elaborate the causes of that crack. (10 marks)

(c) State **THREE (3)** repair methods and **THREE (3)** prevention methods for the crack. (12 marks)

- END OF QUESTIONS -