Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2023/2024

COURSE NAME	:	CONSTRUCTION ENGINEERING
COURSE CODE	:	BFR 21503
PROGRAMME CODE	:	BFR
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

Q1 Retaining walls are typically constructed from various materials, including concrete, stone, brick, timber, or reinforced soil. The choice of material depends on factors such as the desired aesthetics, structural requirements, and environmental conditions.

(a) Define the term "retaining wall".

(2 marks)

(b) List **FIVE (5)** types of retaining wall.

(5 marks)

(c) Explain **THREE (3)** the factors that contributing to retaining wall failure.

(6 marks)

(d) With the aid of illustration, explain the effects of groundwater on a retaining wall.

(12 marks)

Q2 Substructure plays a critical role in the overall stability and performance of a structure. It ensures that the loads imposed on the structure are safely transferred to the ground, preventing excessive settlement, tilting, or failure.

(a) Define substructures.

(3 marks)

(b) Compare between shallow foundation and deep foundation.

(4 marks)

(c) Describe the advantages and disadvantages of spun pile.

(6 marks)

(d) The main purpose of a building is to connect the structural load to the ground, ensuring stability, load distribution, and strength.

(i) Sketch **TWO (2)** types of raft foundations.

(4 marks)

(ii) Discuss the condition for these foundations and the importance of ensuring the stability of the structure.

(8 marks)

Q3 Superstructure is an essential part of any construction project. It is designed to withstand various loads, including the weight of the structure itself, occupants, furniture, and environmental forces such as wind, snow and earthquakes.

(a) Explain **THREE (3)** characteristics of superstructure system.

(6 marks)

(b) Discuss the advantages of non-suspended slab and suspended slab.

(8 marks)

(c) With the aid of diagrams, categorise **FIVE (5)** distinct types of beams, characteristics and applications.

(11 marks)

Q4 (a) Discuss the calculation process that required volume of cut or fill for a construction site, including the methods and formulas used to estimate the quantity of soil to be excavated or added during earthworks.

(12 marks)

(b) Analyze the factors influencing the decision to implement cut or fill techniques on a construction site within the concept of earthworks and site grading in engineering.

(13 marks)

- END OF QUESTIONS -