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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2022/2023**

COURSE NAME : CONSTRUCTION ENGINEERING
COURSE CODE : BFR 21503
PROGRAMME CODE : BFR
EXAMINATION DATE : JULY/AUGUST 2023
DURATION : 3 HOURS
INSTRUCTION : 1.ANSWER ALL QUESTIONS
2.THIS FINAL EXAMINATION IS
CONDUCTED VIA **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

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- Q1** (a) The purpose of the Site Investigation is to determine the site suitability for construction, the surrounding environment, and the scope of the initial work required. As an Assistant Architect, the information provided by engineers is extremely useful for building planning, site adaptation, and design prior to the construction process.
- (i) Define Site Investigation. (2 marks)
 - (ii) List and explain **THREE (3)** crucial issues that need to be checked in Site Investigation Process. (6 marks)
 - (iii) Discuss in detail how the investigation must progress through the **SIX (6)** stages associated with Site Investigation. (12 marks)
- (b) Soil strata are often collected for investigation while analysing building construction sites. Illustrate and label the form of soil strata. (5 marks)
- Q2** (a) Earthworks can have a significant impact on the environment, particularly in terms of soil erosion and water pollution. Proper earthworks can help to minimize this impact by controlling the amount of soil that is disturbed, minimizing runoff, and reducing the amount of sediment that enters waterways.
- (i) List **FIVE (5)** the scope of earthworks. (5 marks)
 - (ii) Explain the grid methods in cut and fill process. (8 marks)
- (b) Key to successful earthworks includes identify and monitor the cut and fill process that produces horizontal and vertical good layout and minimizing stockpiling. Other than grid method in cut and fill process, there is another method that can be use in the ground cut and fill process.
- (i) Discuss another method that can be used in ground cut and fill process other than the grid method. Provide sketches to support the discussion. (12 marks)

- Q3** To ensure the safety and stability of a retaining wall, it is important to follow proper engineering and construction practices. This may include selecting the appropriate materials, designing the wall to withstand the expected load and soil conditions, and ensuring proper drainage to prevent water from building up behind the wall.
- (a) Define retaining wall through the perspective of architectural engineering. (4 marks)
 - (b) Discuss the details with aids of illustration **THREE (3)** common types of retaining structures used in building substructures. (6 marks)
 - (c) Differentiate functions of retaining structures in architectural engineering and civil engineering. (10 marks)
 - (d) State **FIVE (5)** types of building loads that can affect the design of the substructure. (5 marks)
- Q4** (a) The superstructure is the portion of a building that is above the foundation and includes the walls, floors, roofs, and other structural components. It is an essential part of any building, as it provides the framework for the functional and aesthetic aspects of the structure.
- (i) With aid of sketches, explain how the load is distributed among the different components in a double storey building from the roof to the footing. (7 marks)
 - (ii) Beam and Slab, Column, Wall, and Roof are key components of a building superstructure in construction engineering. Explain how these components contribute to the overall stability and functionality of the building. (8 marks)
- (b) Scaffolding systems are temporary structures used to support workers and materials during construction. They consist of vertical standards, horizontal ledgers, diagonal braces, and platforms. There are different types of scaffolds, including tube and coupler, system, and frame scaffolds. Safety regulations must be followed during erection, use, and dismantling of scaffolding systems.
- (i) Clarify **FIVE (5)** advantages of scaffolding systems in construction that make them a valuable and life-saving structure for workers, regardless of the size of the project. (10 marks)

-END OF QUESTIONS -