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Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

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

COURSE NAME : CONSTRUCTION ENGINEERING

COURSE CODE : BFC 21002

PROGRAMME CODE : BFF

EXAMINATION DATE : JULY/ AUGUST 2023

DURATION : 2 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 **FOUR (4)** PAGES

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- Q1** (a) Site investigation (S.I) work is critical in understanding ground conditions and determining the impact of proposed structures to be erected on site. Explain **FIVE (5)** types of SI information you'll need as a Site Engineer for a new three-story office building with a basement in a densely populated urban region to plan the construction work.
(10 marks)
- (b) Building construction in hilly regions requires comprehensive planning, site selection and design for slopes and sustainable construction practices. Hilly regions have wide variations in geology, geomorphology, climate, altitude, and materials resources. Once the site investigation has taken place, the pre-construction activities or earthwork can be started. By relating to the site area mentioned, prepare the activities involves during site clearing.
(15 marks)
- Q2** (a) A hundred-storey residential condominium is planning to be built in the South part of Peninsular Malaysia. The building will be located near the coastline of Malacca Straits and the soil condition of the construction site is uniform soil with a high bearing capacity value. As an engineer, you are appointed to design the foundation of this building. Identify the suitable type of foundation for this project and with the aid of a sketch, produce the procedure for constructing this type of foundation.
(15 marks)
- (b) The foundation consists of a shallow foundation and a deep foundation. The deep foundation can be divided into RC Pile and Spun Pile. Bore Pile etc. Compare **FIVE (5)** differences between Bore Pile and RC Spun Pile.
(10 marks)
- Q3** (a) The concrete reinforcement floor slab may form the slab of a basement, at ground level or upper levels. Therefore, a slab is an important structural element that is constructed to create a flat and useful surface which can be categorized into suspended and non-suspended slabs. The strength of the floor structure should be adequate to carry the dead load of the floor, finishes, fixtures, partitions, services and expected imposed loads of occupants. Evaluate **FIVE (5)** challenges in the construction of non-suspended slabs on the ground floor and suspended slabs on the first floor.
(15 marks)
- (b) Mr Hisham is a building contractor who plans to build his own house in the main town of Batu Pahat. As a designer, he asks you to design a modern style double-storey bungalow with 8 bedrooms, 5 washrooms, 2 living rooms and a kitchen with a minimal budget. With the aid of a sketch, propose the suitable types of walls and roofs for the whole building and justify your selections.
(10 marks)

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- Q4** (a) Infrastructure refers to the basic facilities and systems that help society function and to fulfil the basic livelihood of citizens and businesses. Therefore, in one part, road infrastructure plays a crucial role by providing mobility for efficient movements, as well as providing access to economic and social activities. List **FIVE (5)** design criteria for road infrastructure. (5 marks)
- (b) In Malaysia, landslides are among the deadly hazards which occur quite frequently during the rainy seasons. Undeniably, in some cases, landslides occur because of flawed design, improper construction and non-maintenance of slopes which correlates with human errors. By referring to the Landslide area in business premises at Jalan Tun Razak, Raub, Pahang (Resource: The Straits Times, 2022), **Figure Q4**.
- (i) Identify **FIVE (5)** factors that need to be considered when designing a retaining wall. (10 marks)
- (ii) With the aid of a sketch, identify **TWO (2)** types of retaining wall as an engineering solution to minimize the risk and avoid the scenario from happening and justify your answer. (10 marks)

– END OF QUESTIONS –

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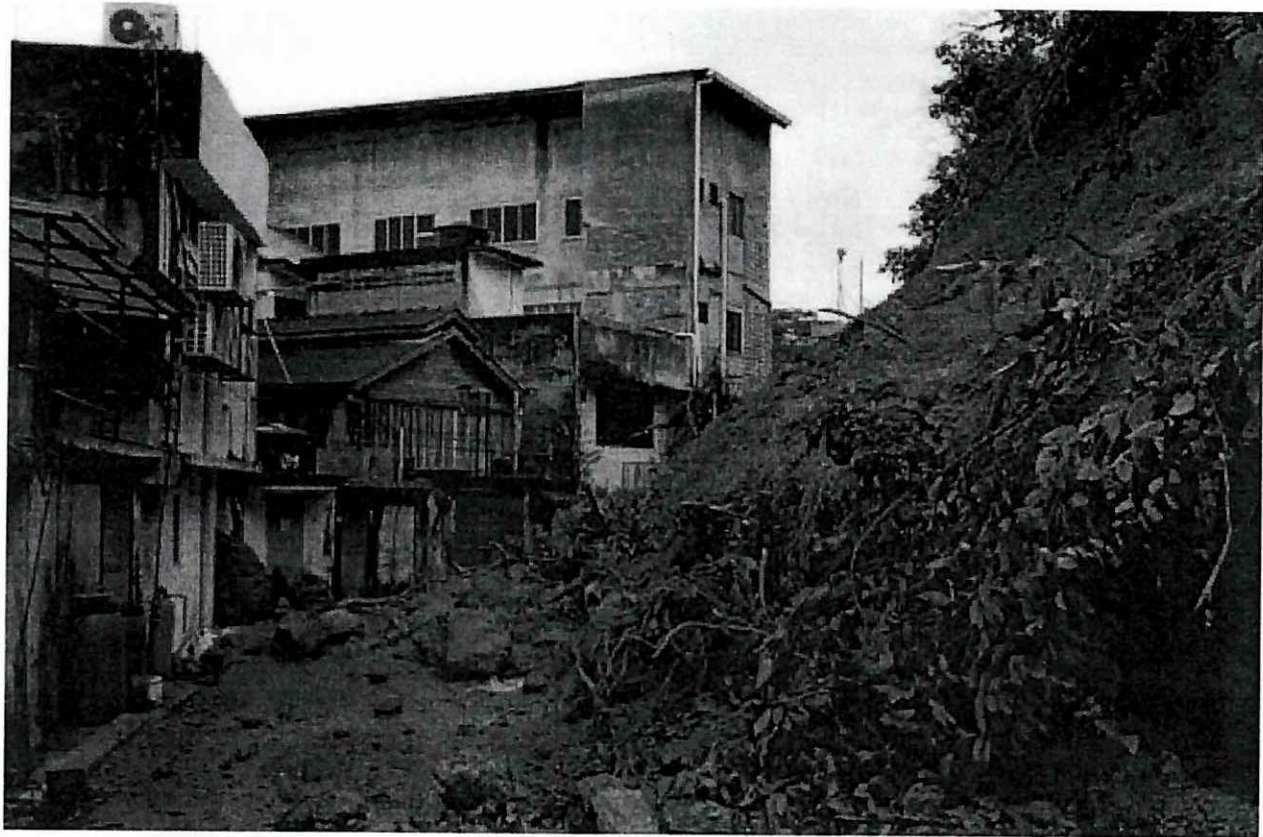


Figure Q4

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