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UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2020/2021**

COURSE NAME : SUSTAINABILITY IN ARCHITECTURE
COURSE CODE : BFR 21103
PROGRAMME CODE : BFR
EXAMINATION DATE : JULY / AUGUST 2023
DURATION : 3 HOURS
INSTRUCTIONS

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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TERBUKA

- Q1** (a) Define the following terms:
- (i) Soil erosion
 - (ii) Desertification
 - (iii) Green building
 - (iv) Sustainable Development
- (4 marks)
- (b) Explain global warming and discuss **THREE (3)** strategies to mitigate its effects.
(6 marks)
- (c) Discuss **FIVE (5)** Sustainable Development Goals (SDGs) highlighted by the United Nation that are related to architecture.
(15 marks)
- Q2** (a) Daylighting refers to the practice of using natural light to illuminate the interior of buildings without relying on artificial lighting. Explain **TWO (2)** benefits of daylighting in building design.
(4 marks)
- (b) Skylights and atria can be used to incorporate natural light into building. Illustrate how to provide natural light using skylight and atria in areas with high ceilings.
(6 marks)
- (c) Solar passive design strategies emphasis on sun orientation as a major design consideration, and shadings devices are commonly used to control the amount of sunlight entering buildings.
- (i) Discuss the use of external shading devices as an effective strategy for reducing solar radiation and heat gain inside buildings.
(6 marks)
 - (ii) Based on **Q2 (c) (i)**, illustrate how shading devices can have an aesthetic impact on facade design.
(9 marks)
- Q3** (a) Explain what is building envelope in façade design.
(3 marks)
- (b) (i) Explain OTTV and its purpose.
(4 marks)

- (ii) A Malaysian Standard for Energy Efficiency in Buildings: MS1525:2007, discuss the **THREE (3)** elements that should be evaluated in OTTV. (9 marks)
- (c) Convection, conduction and radiation are three important mechanisms of heat transfer in building. Based on **Figure 3 (c)**;
- (i) Explain the process of thermal transfer in building. (3 marks)
- (ii) Complete the figure, and attach the labelled figure to the answer script. (6 marks)
- Q4** An energy audit is a detailed evaluation of a building's energy use, aiming to find areas where energy is wasted and suggesting measures to improve energy efficiency, ultimately reducing energy consumption and costs.
- (a) Explain **TWO (2)** types of energy audit. (4 marks)
- (b) Describe **THREE (3)** factors that can affect building energy use. (9 marks)
- (c) Review **FOUR (4)** detailed energy audit procedures. (12 marks)

– END OF QUESTIONS –

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Figure Q3 (c): Heat transfer in building

