

**CONFIDENTIAL**



**UTHM**

Universiti Tun Hussein Onn Malaysia

**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAMINATION  
SEMESTER II  
SESSION 2021/2022**

**COURSE NAME : SUSTAINABLE CONSTRUCTION  
MANAGEMENT**

**COURSE CODE : BFC 32703**

**PROGRAMME CODE : BFF**

**EXAMINATION DATE : JULY 2022**

**DURATION : 3 HOURS**

- INSTRUCTION**
- 1. ANSWER ALL QUESTIONS**
  - 2. THIS FINAL EXAMINATION IS AN  
ONLINE ASSESSMENT AND  
CONDUCTED VIA CLOSE 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 FIVE (5) PAGES**

**CONFIDENTIAL**

**TERBUKA**

**Q1** A proposal of a residential development project consisting of 16 blocks of 88 storey condominiums complete with 10 units of four-storey shop lots and 2 recreational centers including 2 swimming pools, a tennis court and a public hall has been submitted to Municipal Council to be evaluated. The location of the proposed project is a hilly area 25 km from a city center and 15km from a kampong area. As one of the Municipal Council evaluator, you have to ensure the project incorporate sustainability before the proposal can be approved.

(a) Explain **THREE (3)** possible impacts of construction activities at every stage of the construction phase (before, during, and after) of the proposed project on the environment of the city center and the kampong area.

(14 marks)

(b) Justify **THREE (3)** concept of sustainable construction that should be incorporated in the project **Q1** to protect the environment, to ensure social well being and economic prosperity.

(6 marks)

(c) Explain the definition of value management and give **TWO (2)** examples of how it can be applied in the project **Q1**?

(5 marks)

**Q2** The popular concept of 3Rs – reduce, reuse and recycle are gaining popularity in construction industry in supporting sustainable development. The concept of 3Rs slow down the rates of contamination and depletion of natural resources particularly in material extraction for construction activities. In the ecological and sustainable design, concept of “cradle to grave” was introduced to the fact that construction products or materials have significant impacts throughout their entire life cycle; from the raw materials (cradle) to disposal (grave).

(a) In order to optimise the use of resources mindfully, describe the consideration that need to be taken into account during material selection.

(8marks)

(b) Choose **ONE** example of construction material or product. Then, illustrate the life cycle of the material (or product) using the concept of “cradle to grave”.

(5marks)

- (c) Many construction projects are overbudget and delivered late. Not to mentioned, he numbers of fatality cases in the construction industry are among the highest in the 10 categorised industries in Malaysia. In response to customer and supply chain to satisfaction, lean construction has been progressively practiced to encounter such challenges. It is founded on commitments and accountability that improves trust and builds a more satisfying experience every step of the construction activities. Lean construction processes are designed to remove variation and create continuous workflow to drive significant improvement in efficiency and productivity. These practices ultimately lead to higher quality and lower cost projects. Examine how the concept and principles of lean construction could contribute to each pillar of sustainability in promoting sustainable construction practice in Malaysia.

(12marks)

**Q3** You have been appointed as the project manager for development of a new condominium at Johor Bahru. The project consists of the following details:

<b>Project details</b>
Two blocks of residential (Block A & B)
Playground and Tennis court
Swimming Pool
Office building
Three Multi-purpose rooms

- (a) You are required to demonstrate a graphical work break down structure in four-level for construction of the condominium including the details in the above table.
- (b) A network diagram allows a project manager to track each element of a project and quickly share its status with others through a graphical representation of the project. Table 1 displays the duration of project activities and the dependencies between the activities.
- (i) You have been assigned as the project planner to construct a network diagram using Arrow Diagram Network (ADM) by calculating the early start (ES), early finish (EF), late start (LS) and late finish (LF) for each activity to analyse the project duration and identify the critical activities.

(7.5 marks)



- (ii) Prepare a Gantt chart and Financial S-Curve for the project based on the Table 1 and data obtained in Q3 (b).

(14 marks)

**Q4** You have been assigned as engineering on building construction in Johor Bahru, responsible for procurement stage activity.

- (a) Draw a figure that explain Procurement steps. (4 mark)

- (b) Give your justification about each procurement stages and relevant responsibility that you have to do in order to accomplish the successful job. (4 marks)

- (c) Human resources or labour resource management is an important aspect that requires serious consideration during project development. It is made up between 20-30% of total construction cost. Managing labour involved planning, organizing, monitoring and control. Answer the following questions based on **Table Q4**.

- (i) Construct a network diagram using Precedence Diagram Method (PDM) to determine the constructions activities total duration. (4.5 marks)

- (ii) Summarize all the ES, LS, EF, LF and TF in a table. Show the critical activities in the construction activities network. (4.5 marks)

- (iii) Based on the self-developed ADM network diagram, construct a resource histogram to determine the resource distribution. Perform a resource levelling if the maximum number of labour is limited to 6 person only. (8 marks)

– END OF QUESTIONS –

TERBUKA