Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2023/2024

COURSE NAME	:	SUSTAINABLE CONSTRUCTION MANAGEMENT
COURSE CODE	:	BFC 32703
PROGRAMME CODE	:	BFF
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 **FOUR (4)** PAGES

Q1 (a) Effective project management means having a firm grasp on managing cost, time and quality dedicated to a project. Meanwhile, an effective project manager can manage unplanned issues while continuing company goals and tasks in progress. Thus, explain **FIVE (5)** principles of sustainable construction that can be considered by any construction company before starting the project.

(15 marks)

(b) Construction project life cycle is the phases of activities that a project goes through from its initiation to its closure, and it is a proper order of completing tasks in a construction project. It also acts as a guide for the entire process of completing a project, beginning with the initial conception to the final details involving the nature of the project, and its area of application. As a project manager in the workplace, illustrate the diagram of the project life cycle to effectively manage and execute the construction process.

(10 marks)

Q2 You are the project manager entrusted with overseeing a large-scale sustainable construction project that is of national importance. The project involves the development of an industrial park consisting of heavy and light industrial into a mixed-use urban complex with residential buildings, commercial facilities, and recreational areas. The site, which has a significant culture, is in a fragile ecosystem near a riverbank. The construction timeline is aggressive and must be completed within two years.

The project also has several distinctive features and challenges:

i. There is a strict budget, and the project must secure funding from both government grants and private investors.
ii. The local community is deeply concerned about the environmental impact and expects a high level of community engagement.
iii. Sustainability goals are ambitious and include achieving net-zero energy consumption, zero waste, and top-tier green certifications.
iv. The project requires the use of advanced digital technologies (e.g. Building Information Modelling (BIM)) and construction collaboration tools.

(a) Analyse the project organization to address the environmental, and community engagement aspects of the project while meeting sustainability goals.

(6 marks)

(b) Explain **SIX (6)** strategies to secure the necessary funding for the project, balancing all the funding either from government grants or private investments by emphasizing its sustainability and community benefits.

(12 marks)

(c) There are many unique challenges and opportunities in using advanced digital technologies such as Building Information Modelling (BIM) and construction collaboration tools to achieve sustainability goals. As a project manager, prioritize **FIVE (5)** explanations of how these tools can be effectively integrated into the construction project.

(7 marks)

Q3 **Table Q3.1** shows the details of the activities involved in a building construction project. As an engineer of the construction firm, you have been assigned by the project manager to perform planning and scheduling for a construction project with all its related activities.

Table Q3.1 Details of the construction of a building

Task	Immediate predecessor	Duration (weeks)
A	-	2
B	A	4
C	B	2
D	A (SS+2)	3
E	C (FS+3)	2
F	E, D	4
G	F	2
H	J, F (FF+1)	4
I	G, H	4
J	D	5

(a) By referring to **Table Q3.1**, construct a network diagram using the precedence diagram method to determine the total duration of the project. Produce a table showing the early start (ES), early finish (EF), late start (LS) and late finish (LF) for each activity.

(13 marks)

(b) Identify the critical path in the network diagram.

(2 marks)

(c) Develop a Gantt chart for this project according to the findings in **Q3(a)** and **Q3(b)**.

(10 marks)

Q4 (a) Total Quality Management (TQM) has become a cornerstone in modern construction practices, where the emphasis is not solely on completing projects but also on achieving the highest standards of quality, efficiency, and client satisfaction. In this context, it is essential to outline the **SIX (6)** expected outcomes of implementing TQM at a construction site. Outline the expected outcomes of the TQM implementation at the construction site.

(6 marks)

(b) Explain the **FOUR (4)** criteria to be considered by any construction firm before choosing the most effective project management organizational structure.

(10 marks)

(c) Illustrate the delivery method comparison diagram for Design-Bid-Build and Design-Build in terms of time consumption to complete the design, bid and construction process.

(9 marks)

- END OF QUESTIONS -