



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2023/2024

- COURSE NAME : SUSTAINABLE CONSTRUCTION MANAGEMENT
- COURSE CODE : BFC 32703
- PROGRAMME CODE : BFF
- EXAMINATION DATE : JANUARY/FEBRUARY 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 FIVE (5) PAGES

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Q1 Sustainable construction is generally based on healthy built-environment concepts concerned with resource efficiency and a balanced ecology life cycle.

- (a) Explain the application of the Triple Bottom Line (TBL) concept for sustainable development.

(5 marks)

- (b) Determine basic management activities in the construction industry.

(10 marks)

- (c) Sustainable construction was originally proposed to describe the construction industry's responsibility in attaining sustainability. Analyse **FIVE (5)** major construction issues which can have negative impacts on the sustainable development process.

(10 marks)

Q2 You are a seasoned project manager entrusted with overseeing a large-scale sustainable construction project that is of national importance. The project involves the redevelopment of a historic industrial site into a mixed-use urban complex with residential buildings, recreational spaces, and commercial facilities. The site, which has a significant cultural heritage, is located in a fragile ecosystem near a river.

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 historical and 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 Modeling (BIM)) and construction collaboration tools.
- v. The construction timeline is aggressive and must be completed within three years.

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

(6 marks)

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- (b) Point out the strategies to secure the necessary funding for the project, balancing government grants and private investments by emphasizing its sustainability and community benefits.

(12 marks)

- (c) Many unique challenges and opportunities through the use of advanced digital technologies such as Building Information Modelling (BIM) and construction collaboration tools to achieve sustainability goals. As a project manager, prioritize 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	-	3
B	A	1
C	B	2
D	C	1
E	D	2
F	E	1
G	E(SS+1)	2
H	G	3
I	H	3
J	D	2
K	I	1
L	H	2
M	F,G,J,K,L	2

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

(13 marks)

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- (b) Identify the critical path in the network diagram. (2 marks)
- (c) Based on the network diagram constructed in Q3(a), distinguishes the effect of delays in Task D versus delays in Task F on the project end date. (5 marks)
- (d) Develop a Gantt chart for this project according to the findings in Q3(a) and Q3(b). (5 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. Outline the expected outcomes of the TQM implementation at the construction site. (2 marks)
- (b) Cost management plays a pivotal role in the successful execution of on-site construction project. It is essential to understand why the implementation of cost management holds such critical importance in the realm of construction project. Outline the critical importance of implementing cost management in on-site construction project. (4 marks)
- (c) Interpret the primary components of project cost in the construction industry and please provide real-world examples of how these components are applied in the planning, execution, and management of construction projects. (2 marks)

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- (d) Identifies the strategies of risk management in the construction industry, and please provide real-world examples illustrating how effective risk management practices have been applied to enhance the success and sustainability of construction projects. (4 marks)

- (e) As an appointed contractor, your client requires a security assurance to ensure the project can be executed smoothly. Compare construction insurance and performance bonds in the context of risk management for construction projects (3 marks)

- (f) A contractor is required to complete a project with activities as shown in **Table Q4**. Only 40 workers per day are able to be allocated in that project. Level the manpower manually to comply with the maximum number of manpower provided by the contractor.

Table Q4: Information for Project Q4

Activity	Duration (days)	Predecessor(s)	Manpower/day
A	8	-	25
B	5	-	20
C	3	-	20
D	5	C	15
E	5	B	20
F	5	A	40
G	5	F	10

(10 marks)

- END OF QUESTIONS -

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