Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2023/2024

COURSE NAME	:	CONTRACT AND ESTIMATION
COURSE CODE	:	BFC 35503
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 **SIX (6)** PAGES

Q1 In project management, there are 5 major phases, which are planning, design, tendering, construction, and maintenance. These phases are important to ensure the success of the proposed construction project.

(a) Explain in detail the technical activities that could be organised and implemented in planning and design stages.

(12 marks)

(b) Offer and acceptance are the two key elements in the formation of contract. Discuss examples of 'invitation to treat', 'offer', and 'counteroffer' in the formation of contract for a construction project between a client and a contractor.

(7 marks)

(c) Explain the possible **TWO (2)** approaches to terminate the construction contract that can be taken by the contractual parties.

(6 marks)

Q2 (a) You are working as a construction project manager and need to calculate the build-up rate for a concrete mix to ensure efficient and cost-effective construction practices. Considering the information in **Table Q2.1,** calculate:

Table Q2.1: Concrete mixing work information

Concrete Grade	30
Concrete Mix Ratio	1:1.5:3
Portland Cement Cost	RM20/bag
Aggregates (fine)	RM29m^3
Aggregate (coarse)	RM35m^3
Rental and Maintenance Cost of Concrete Mixer	RM70
Capacity of concrete mixer	10/7, producing 4m^3 of concrete mix per hour
Waste	25%
Worker's productivity	3 hours per cubic meter @RM40/day
Concrete mixer required worker	4 workers
Profit	10%
Overhead	5%

(i) Total material cost for 1m^3 of concrete mix based on the given mix ratio and material prices.

(3 marks)

(ii) Total worker cost for $1m^3$ of concrete mix considering the worker productivity rate and the number of workers.

(3 marks)

(iii) Total equipment cost for $1m^3$ of concrete mix using the rental concrete mixer.

(3 marks)

(iv) Overall cost, including profit and overhead for $1m^3$ of concrete mix.

(2 marks)

(b) According to PWD 203A: Clause 13, the contractor shall provide a Performance Bond/ Performance Guarantee Sum (on the date of Site Possession).

(i) Define performance bond in the context of construction contracts.

(2 marks)

(ii) Discuss the specific requirements on performance bond as outlined in PWD 203A: Clause 13.

(2 marks)

(iii) Explain the importance of performance bond for the employer.

(2 marks)

(c) A contractor is awarded for the construction of an office building. A part of the job scope is to construct a foundation using the data of soil condition reports provided by the client during the tender process. By using the information, the contractor quotes RM100,000 for foundation work. The contractor undertakes soil assessment prior to beginning site work and discovers that the value of foundation work will be approximately double from the quote price. In light of circumstances, the contractor wishes to withdraw from the contract, since they are unable to continue the work at the agreed-upon cost. Discuss on the possible terms of contract conditions in this case. The discussion must include: the possible approaches to terminate the construction contract that can be taken by the contractual parties.

(i) related clause of contract

(2 marks)

(ii) situation related to clause of contract

(4 marks)

(iii) possible solution to the situation

(2 marks)

Q3 (a) A new project development for a multipurpose commercial building project consisting of 3-storey shopping complex, 8-storey office units, and 12-storey apartments have been proposed at Jalan Batu Pahat, Kluang, Johor. The proposed project will be located near the existing business and housing area. The project aims to implement green building approaches with unique design and appearance. Therefore, it is important that this proposed project shall be awarded to a qualified contractor that can provide creative engineering and construction solutions and can be completed within a reasonably short period.

(i) Recommend a suitable procurement method for this project. Discuss all factors that are considered for selecting the procurement method.

(10 marks)

(ii) Explain the pre-construction stages and processes that directly involve the appointed main contractor in the project delivery using the recommended procurement method in **Q3**(a)(i).

(10 marks)

(b) Discuss **TWO (2)** acceptable reasons that can be used by a contractor as a basis to claim for an extension of time (EOT).

(5 marks)

Q4 **Figures Q4.1, Q4.2, Q4.3,** and **Q4.4** show the layout and cross-section details of the canteen in the university yard at Kuala Lumpur City Centre. During the construction of the canteen building, you are assigned to do a quantity measurement of the work below the lowest floor finish. Calculate the following items according to the given figures and **Table Q4.1**:

(a) The volume of soil that needs to be excavated up to the reduction level (in m^3). Take into account that 100mm of topsoil has been removed from the original ground level (in m^3).

(4 marks)

(b) The volume of lean concrete needed for the concreting of ground beams and pad footings (in m^3).

(6 marks)

(c) The reinforcement bars in pad footings and ground beams (in kg).

(15 marks)

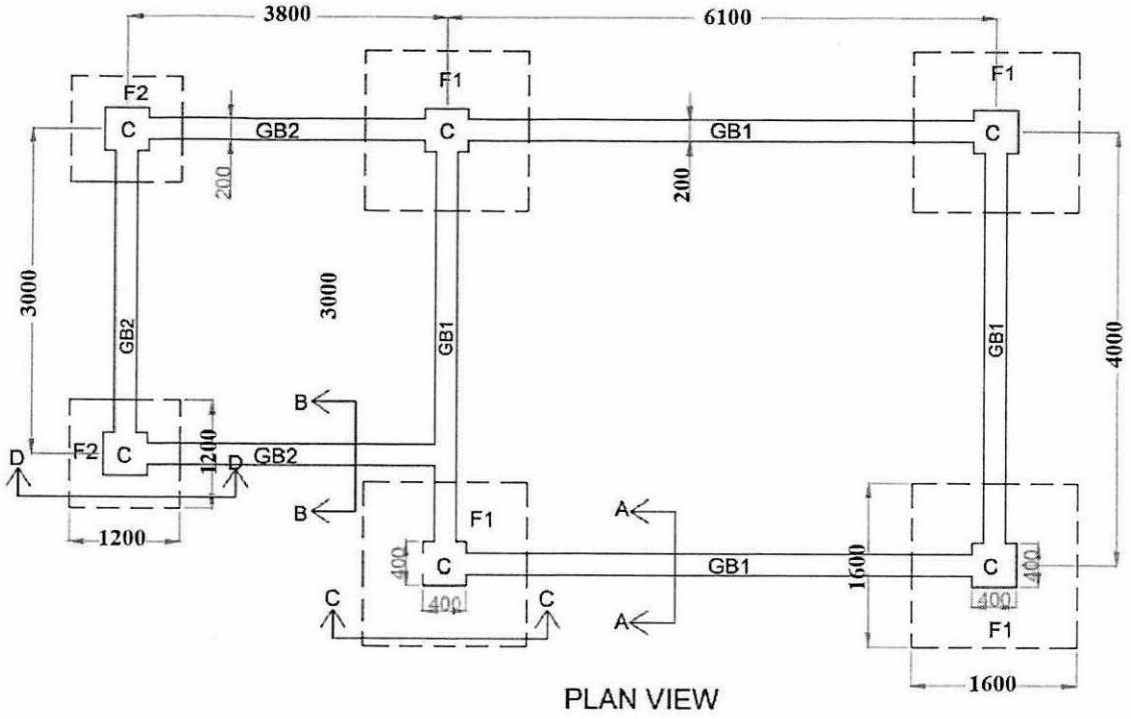

Figure Q4.1: Pilecaps layout

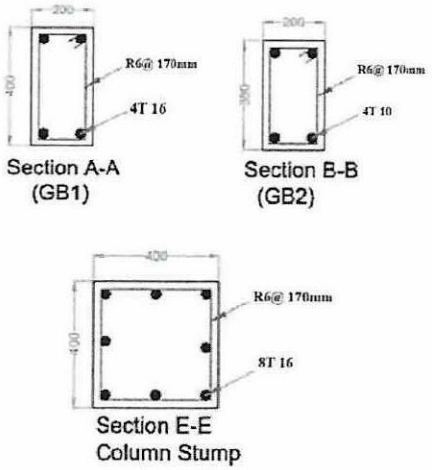

Figure Q4.2: Column stump and ground beam detailing

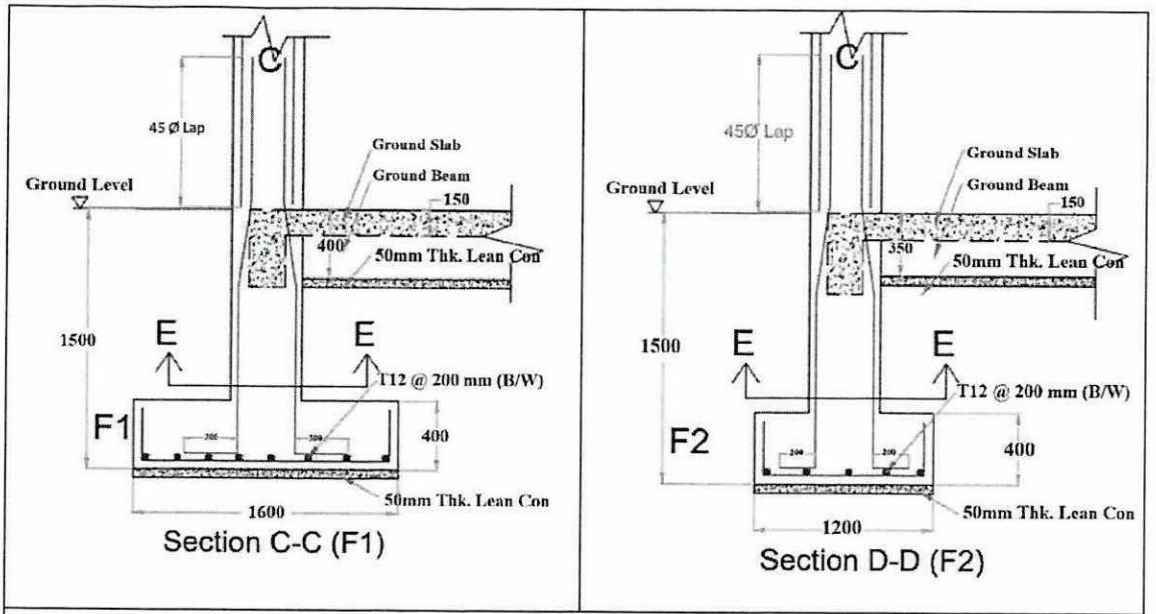

Figure Q4.3: Pilecaps section

NOTES :

1. ALL DRAWINGS ARE NOT TO SCALE
2. ALL DIMENSIONS ARE IN MILIMETRE (MM) UNLESS OTHERWISE NOTED.
3. ALL CONCRETE COVERS SHALL BE 40 MM THICK.
4. LEAN CONCRETE SHALL BE OF GRADE 7 CONCRETE
5. PAD FOOTING, COLUMN STUMP AND GROUND BEAM SHALL BE OF GRADE 25 CONCRETE

Figure Q4.4: Technical notes

Table Q4 - Conversion table for round bar

SIZE (MM)	MASS PER UNIT LENGTH (KG/M)
06	0.222
08	0.395
10	0.616
12	0.888
16	1.579
20	2.466
25	3.854
32	6.313

- END OF QUESTIONS -

BFC35503 – TAKING OFF SHEET

NAME: _____ ***MATRIC NUM.:*** _____

DIMENSION			UNIT	DESCRIPTION