

Exam Questions for June 2023

CONSTRUCTION BUSINESS ENVIRONMENT

ANSWER ONLY 1 OF THE QUESTIONS. You are allowed 4 attachments. 1 must be the front cover sheet.

Q.1)

Refer to your drawings and scenario

The client requires the successful contractor to complete the design based on the concept design, obtain detailed planning permission, and construct the building and external works on a design and build basis.

The client is not willing to consider qualified bids.

TASK:

As the client's project manager, prepare a report identifying the commercial, operational, and environmental risks that a contractor would have to consider and evaluate when designing and costing the substructure and other works below ground level carried out on a design and build basis.

The report should also advise the client on a cost-effective procurement procedure that would reduce or eliminate disproportionate risk premiums that may be added at the tender stage by the tenderers.

(30 Marks)

OR

Q.2)

Refer to your drawings and scenario

The lease on the building in which the benefactor's artefacts have been stored is shortly to expire and the building owner is insisting on a five-year lease, as a condition for the lease to be extended.

The Client has no other facilities with the required storage conditions available. The duration of the planning process to obtain full planning permission for the project has become uncertain because of a pressure group formed by nearby residents concerned about the potential dangers from airborne contaminants if onsite remediation of the soil to comply with current regulations is required, which may contain hydrocarbons and include benzene, cyanide and naphthalene in an open-air "soil hospital" which it has been suggested, maybe a cost-effective way of remediating to comply with current standards.

Because of the uncertainty of a site possession date for the contract, the order for the project has not yet been placed with the preferred main contractor. The project will be carried out on a design and build basis.

If the order for the steel frame is not placed in accordance with the programme the overall works will be delayed. When the lease on the existing property expires there will not be a suitable environment to house the delicate items that require a controlled environment.

The client is considering issuing a letter of intent to procure the steel frame in advance to comply with the project's programmed completion date.

TASK:

Prepare a report that explains how the letter of intent may be written to secure the design, manufacture and erection of the steel frame and explain why each of the terms in the letter of intent should be included.

(30 Marks)

MANAGEMENT

ANSWER ONLY 1 QUESTION. You are allowed 4 attachments. 1 must be the front cover sheet.

Q.1)

Refer to your drawings and scenario

TASK:

- A) The storage facility was initially considered a design and build project, but the client has requested information on other forms of procurement before proceeding with proposals. As an advisor to the client, prepare a report which details Design and Build, and TWO other suitable forms of contract procurement routes, with the implications for design and site production, including their advantages and disadvantages. Your report should conclude with a reasoned selected procurement route for the storage facility.**

(14 Marks)

- B) For the selected procurement route in part A of the question, prepare an organisation chart for the project indicating direct, lateral, and functional relationships between all participants, including other service departments within the appointed main contractor's organisation.**

(8 Marks)

- C) Explain the duties and responsibilities of participants on the organisation chart in achieving successful project delivery.**

(8 Marks)

OR

Q.2)

Refer to your drawings and scenario

- A) Identify work packages for the storage facility and prepare a logic-linked construction programme for the works indicating stages of completion and project duration.**

(15 Marks)

- B) While considering the construction programme, information is received on supply chain issues with the external cladding and an expected delay of five weeks for delivery. To avoid financial penalties for late project completion, examine how the construction programme can be accelerated to complete the works on time, including calculated increased costs, and evaluate the practical issues surrounding the delivery of the accelerated construction programme.**

(15 Marks)

HEALTH, SAFETY AND WELFARE

ANSWER ONLY 1 QUESTION

You are allowed 4 attachments. 1 must be the front cover sheet.

Q.1)

Refer to your drawings and scenario

The stored artefacts within the storage facility are valuable, and the client wants maximum protection from fire and any ancillary damage to the artefacts. In addition, the building must be fully compliant with UK legislation.

Your company is the Main Contractor for the scheme and will need to develop the outline drawings into a fire strategy.

TASK:

A) Identify the applicable UK fire legislation appropriate for the storage facility.

(5 Marks)

B) Produce an illustrated report explaining how both the client's requirements and legislative requirements for fire safety can be met.

(25 Marks)

OR

Q.2)

Refer to your drawings and scenario

The Client has indicated that the building will need to be 'accessible' (Disability Discrimination Act).

TASK:

A) Identify the legal framework underpinning accessibility.

(5 Marks)

B) Prepare an illustrated report explaining how relevant legislative requirements can be met to ensure that the building is compliant with UK legislation and safe for all users.

(25 Marks)

CONSTRUCTION TECHNOLOGY

ANSWER ONLY 1 QUESTION

You are allowed 6 attachments. 1 must be the front cover sheet.

Q.1)

Refer to your drawings and scenario

TASK:

As the contractor's Design Manager, prepare an illustrated technical report for the Project Manager, that describes and evaluates viable options and their preferred solution for the following aspects of the development

- A) The construction of the storage building superstructure including transmission of imposed loads to a suitable substructure.**

(10 Marks)

- B) The building's environmental control systems strategy required to create an energy efficient controlled environment on the ground floor and general environmental control in other areas.**

(12 Marks)

- C) Opportunities for the incorporation of prefabrication and off-site construction for the development.**

(8 Marks)

OR

Q.2)

Refer to your drawings and scenario

Since the original conceptual design was developed, as shown on the drawings provided, the following events have occurred:

The price of steel has increased dramatically.

Local legislation has been introduced to encourage the incorporation of new higher standards of thermal insulation.

Grants are now available to encourage on-site energy generation for public buildings.

TASK:

As the contractor's Design Manager, prepare an illustrated technical report for the Project Manager that considers the implications for the project by changing the main

structural members from steel to concrete. Your report should also consider possible improvements that can be made to the thermal insulation of the external elements. Your report should address these specific areas.

- A) The construction of the building frame and foundations using concrete construction methods compared to steel frame. Thermal insulation strategies suitable for the concrete building.**

(15 Marks)

- B) Strategies and options to increase on-site energy generation.**

(10 Marks)

- C) Compare off site precast concrete for structural members and floors to ready mixed insitu concrete on permanent steel formwork.**

(5 Marks)