

Exam Questions for November 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 has expressed an interest in adopting lean construction for the project and seeks advice on whether it could change its outcome.

TASK:

As the client's project manager, prepare a report evaluating the potential outcomes of adopting lean construction for this project, taking account of the wide range of views within the construction industry and how this may or may not change the relative success of the project from the client's perspective. **(30 Marks)**

OR

Q.2)

Refer to your drawings and scenario

The client wishes to optimise the whole life costs for the project, particularly the energy and operational costs for the controlled environment. They have asked the preferred contractor to examine ways in which the principles and technology required to provide a controlled environment could be evaluated and selected for the storage of delicate items.

TASK:

Discuss the methods the contractor, along with its design team, could use to deliver the optimum or near optimum design solution to meet the client's needs for the project identifying who should be involved in the process. **(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

Candidates should assume that the site is ready to be built on and the land and buildings adjoining the site also belong to the Regional Authority. Additionally, Hudson Road is a busy trunk road carrying traffic at all times during the day.

TASK:

A) Prepare an annotated site layout plan for the project, including provision for personnel accommodation, access, storage, protection and security of materials, plant, and equipment, hoarding, car parking, and traffic management ensuring the effective utilisation and operation of construction resources. **(20 Marks)**

B) Evaluate how just-in-time management might be used on the project for selected materials, components, and services. **(10 Marks)**

OR

Q.2)

Refer to your drawings and scenario

TASK:

It is essential that the appointed contractor maintains effective cost control of the project.

A) Describe and explain the features and operation of a contractor's cost control system that may be used on the project. **(20 Marks)**

B) Explain the actions the contractor's project manager should take to ensure effective project cost control in line with the project manager's company-agreed tender costs. **(10 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 first floor will be formed using precast concrete units (maximum 2.5 tonnes) which will be craned into position.

TASK:

Detail the considerations and actions that will need to be taken into account for this operation to be carried out safely. **(30 Marks)**

OR

Q.2)

Refer to your drawings and scenario

During excavation works for drainage, the operatives dig into a quantity of black liquid, found below the water table which had a strong hydrocarbon smell.

TASK:

A) Identify what possible substances this black liquid could be, their origin and impacts on human health. **(5 Marks)**

B) Explain in detail, the actions that must be taken to control the situation and prevent harm and damage, given that the work must progress and the drain run cannot be diverted. **(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:

Prepare an illustrated technical report that describes and evaluates viable options for the following aspects of the development:

- A) A suitable sub-structure for the building. **(6 Marks)**
- B) Causes and accommodation of, planned and predictable movement in the structure and fabric of the building and the features that should be present to prevent stresses and unpredictable random cracking in the finished building. **(12 Marks)**
- C) The connection of water and drainage services for the development to the existing mains and internal distribution. **(8 Marks)**
- D) Two most significant opportunities for the incorporation of modern methods of construction. **(4 Marks)**

OR

Q.2)

Refer to your drawings and scenario

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

Due to cost considerations, the client has asked that an alternative to the copper cladding on the North Elevation be considered which maintains the original visual effect.

There have been substantial increases in the cost of mains gas and electricity.

The Government has announced financial incentives to encourage off-site and modern methods of construction for publicly funded projects.

TASK:

As the Design Manager, prepare an illustrated technical report for the Project Manager that proposes a method of construction for the concrete first floor and the various implications for the project caused by the above events. Your report should address these specific areas.

- A) The construction of the building's first floor utilising steel framed construction.

(5 Marks)

B) Appropriate consideration of a suitable foundation system. **(5 Marks)**

C) Consideration of alternative materials and methods of construction for the cladding of the North Wall and returns. **(5 Marks)**

D) Strategies and options to increase on-site energy generation and energy conservation aimed to reduce the reliance on mains gas and electricity. **(10 Marks)**

E) Evaluate how adopting off-site construction methods could increase the speed of construction and build quality of the completed building. **(5 Marks)**