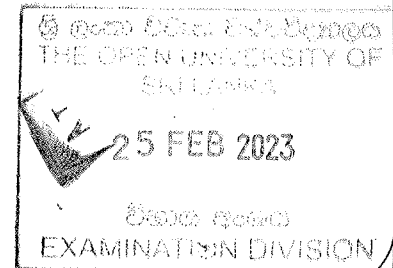


The Open University of Sri Lanka
Faculty of Engineering Technology
Department of Civil Engineering



Study Programme	: Bachelor of Technology Honours in Engineering
Name of the Examination	: Final Examination
Course Code and Title	: CVX4350 Quantity Surveying
Academic Year	: 2021/22
Date	: 25 th February 2023
Time	: 0930 -1230hrs



General Instructions

1. Read all instructions carefully before answering the questions.
2. This question paper consists of **Eight (8)** questions in Four (4) pages.
3. Answer any **Five (5)** questions only. All questions carry equal marks. If you have answered more than five questions (either partly or in full), cross out the answers that you want disregarded. Otherwise only the first five appearing in the answer book will be evaluated.
4. Answer for each question should commence on a new page.
5. Relevant charts/ codes are provided.
6. This is a Closed Book Test (CBT).
7. Answers should be in clear handwriting.
8. Do not use Red colour pens.

Q1)

A Quantity Surveyor along with the members of construction project team normally work together in implementing civil engineering projects.

- i. List the primary functions of a Quantity Surveyor in a building construction project. (04 marks)
- ii. Briefly describe the four (04) steps in BOQ preparation using the traditional method. (04 marks)
- iii. Explain the duties of members of a construction / building project team in implementing a new project. (04 marks)
- iv. Explain the terms *dayworks*, *provisional sums*, *prime cost sums* & *contingencies* in Bills of Quantities associated with civil engineering projects. (04 marks)
- v. Describe three attributes of 'Value' to the client related to a hotel building project. (04 marks)

Q2)

Specifications should be available for each type of civil engineering work and should be adhered to most contracts.

- i. State the three (03) different types of specification as per the BS 7000; Part 4 of 1996. (02 marks)
- ii. Explain how the specifications are useful to the contractor and client. (04 marks)
- iii. Define rate analysis and state the factors affecting the rate analysis. (04 marks)
- iv. List two (02) common ways of defining production rate. Provide an example for each of the two definitions. (04 marks)
- v. Prepare rate analysis for plain cement concrete of grade M15 (1:2:4) with water cement ratio of 0.4 based on the current market prices given below. Assume wet volume of cement = 10 cm^3 and dry volume of concrete is 52% more of wet concrete. Specific gravity of cement = 3.1 g/cm^3 ; volume of a cement bag = 0.035 m^3 ; 1 gallon of water = 3.785 l of water. Two (02) Labour Days are required. Consider the tool cost to be 3% of labour cost. (06 marks)

Current Market Prices

Item	Unit	Unit Rate (Rs)
Cement	Bag	3,000
Sand	Cube	17,000
Water	Gal	5
Coarse aggregate	Cube	15,000
Labourer	Day	2,500

Q3)

- i. What is depreciation? Explain in detail the straight-line depreciation method. (05 marks)
- ii. A construction company purchased a sheepsfoot roller on 01st January 2019 for Rs. 2,500,000. The roller is expected to have a residual value of Rs. 500,000 after 10 years. The company's financial year ends on 31st December. Using the straight-line depreciation method, calculate the depreciation expense for the year 2019. Also find the book value at the end of 2025. (05 marks)
- iii. Describe how the plant hire rate is calculated for power driven mechanical plants and small and non- mechanical plant separately. (05 marks)
- iv. A backhoe attached with one cubic meter bucket is capable of handling 2 bucket loads per minute under the ideal conditions. However, under a particular operating conditions the average volume per bucket is 0.8 cubic meters and the backhoe is operating 45 min per hour. Under these operating conditions, what is the average output of the backhoe? (05 marks)

Question 04

Estimates are necessary at various stages during the design to keep track of expenditure in civil engineering projects.

- i. State two (02) purposes of supplementary estimates. Give one example for a supplementary estimate. (04 marks)
- ii. A new concrete bridge of four (04) spans of 50 m each has been proposed to a city in Galle district. Prepare a preliminary estimate for the proposed new bridge using the following cost data: You may please state the assumptions made in the computation. (04 marks)
 - (a) Cost of a recently completed similar concrete bridge in a city in the district of Galle is Rs. 850,000,000.
 - (b) The existing bridge has three (03) spans of 60 m each
- iii. Explain the concept of 'Designing to cost' and 'Costing to a design'. (04 marks)
- iv. Calculate the quantity of earthwork required for the construction of an approach road which has the dimensions of Length = 1.0 km, Width of formation = 10 m, Height of embankment = 60 cm and Side slope = 1:2 (04 marks)
- v. State the specific use of Unit Rate method of estimating in construction and explain two (02) commonly used methods of Unit Rate estimating. (04 marks)

Question 05

There are various types of contracts used for execution of civil engineering works.

- i. State the basic requirements in law in order to fulfill a contract. (04 marks)
- ii. State two (02) instances of liability based on negligence in the construction industry. What are the three (03) vital elements that must be provided in order to sue successfully for the tort of negligence? (04 marks)
- iii. Describe the following types of contracts and briefly explain their advantages. (06 marks)
 - (a) Schedule of Rates
 - (b) All - In Contracts (Package and Turnkey)
 - (c) Management Contracts
- iv. List and explain six (06) legal requirements a builder are required to comply when working on a construction project. (06 marks)

Question 06

You are appointed as the Consultant Quantity Surveyor to the proposed Multi-storey apartment project at Colombo. Employer wants to carry out the tendering process as soon as possible.

- i. The purpose of the tendering procedure is to select a suitable contractor. Describe five (05) main factors that need to be considered when selecting a prospective contractor. (05 marks)
- ii. Describe three (03) different types of tendering methods used in construction. (05 marks)
- iii. Discuss the advantages of selective tendering method with reference to the project to which you have been appointed. (05 marks)
- iv. Discuss the role of the Tender Board and the Technical Evaluation Committee with respect to the tender evaluation. (05 marks)

Question 07

Most of the construction contracts are subject to interim payments.

- i. Discuss the advantages of having construction scheduling techniques in the form of bar charts, network diagrams etc. for a building construction project. (04 marks)
- ii. Describe in brief the method of preparation of interim valuation. (04 marks)
- iii. List five (05) factors that may lead to generation of contractor's claims. (04 marks)
- iv. In order to establish the validity of construction claims, accurate records are essential. List eight (08) such accurate records that can be submitted to validate construction claims. (04 marks)
- v. Outline the documentation required for preparation of contractual claims. (04 marks)

Question 08

There are various types of contracts for execution of building and civil engineering works.

- i. The ICTAD Conditions of Contract come under five (05) headings. List these headings. (04 marks)
- ii. The documents forming the contract shall be interpreted in a certain order of priority as per clause 2 of CIDA/SBD 01(second edition). Give the list of these documents in the order of priority. (04 marks)
- iii. As per clause 51 of CIDA /SBD01(second edition) discuss how advanced payment is recovered. (04 marks).
- iv. Explain the conditions for dayworks where applicable according to clause 53 of CIDA /SBD 01 (second edition). (04 marks)
- v. As per clause 14 of CIDA / SBD01 (second edition) the contractor is deemed to have inspected and examined the site and its surroundings, including the ground and sub-soil conditions, before submitting the tender. Explain in brief, how the site investigation should be carried out with respect to clause 14 of CIDA / SBD01 (second edition). (04 marks)

