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THE OPEN UNIVERSITY OF SRI LANKA

DIPLOMA IN TECHNOLOGY (ENGINEERING) - LEVEL 4

FINAL EXAMINATION - 2013/14

CEX4238 - QUANTITY SURVEYING

Time allowed: Three hours

Date: Wednesday, 06th August 2014 Time: 0930 -1230 hours

Answer any five questions. All questions carry equal marks.

If you have answered more than five questions (either partly or in full), cross out the extra answers. Otherwise, only the first five answers appearing in the answer book will be evaluated.

Q1. A civil engineering project is a project which involves the construction or renovation of a structure which results in significant alteration to the environment.

(a) List the stages in the implementation of a construction project and the responsibilities of the design team and its individual members at each stage. (08 marks)
(b) Explain the importance and the relationship of Time, Cost and Quality in a construction project. (04 marks)
(c) List and explain the Quantity Surveyor's primary functions in a project. (04 marks)
(d) Explain the significance of the Bill of Quantities in managing a project. (04 marks)

Q2.

(a) Explain the purpose and need for Specifications. (03 marks)

(b) Prepare a typical dimension paper and take off the items listed below: (03 marks)

Area of 4 No. metal sheets 2.5mm thick, circular in shape having a diameter of 1.2m each.

Volumes of 3 square shaped free stand columns of 0.2m in diameter and 2.5m high.

4 rows 0.75m long × 0.25m wide × 1.25m high free standing blocks 6 in each row.

(c) It is required to find the cost of removing excavated materials from a site. Using the data given below calculate the cost of removing 1 m^3 of material from the site. (05 marks)

Assume: 6 m^3 of material to be loaded and unloaded at the tip.

Tipping charge: Rs. 1000 per load

Site to tip : 4 km round trip

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6 m^3 lorry @ Rs. 2500 per hour including fuel

Average speed of lorry – 30 km/h

Excavator bucket size – 0.33 m^3

Cycle time per bucket : 0.5 minute

Add profit and overheads 15%

(d) Calculate the material requirement for preparing m^3 of 1 1:3:6 cement concrete mix. (05 marks)

You may assume the following:
Density of cement – 1440 kg/m^3
Density of fine aggregate - 1600 kg/m^3
Density of coarse aggregate – 1350 kg/m^3
Water cement ratio – 0.4
Shrinkage of concrete – 25%
Wastage 5%

(e) Discuss the data needed to calculate the cost of building a brick wall. What details would be needed for the Material costs and Labour costs? (04 marks)

Q3. Construction tools and equipment are required in all civil engineering construction projects and these can be owned or secured on rent or leased.

(a) Discuss the advantages and disadvantages of renting plant and equipment. (05 marks)

(b) State the factors necessary to determine the cost of owning and operating equipment. Briefly explain each of the factors. (05 marks)

(c) Describe how the plant hire rate per hour is calculated for plants such as mechanical excavators, backhoe loaders, concrete mixers, cranes, lorries etc. (05 marks)

(d) A bottom dump wagon has six rubber tyres. The cost of one tyre is Rs. 80,000/= and have an estimated life of 5000hrs. The repair cost IS 10% of the initial cost of tyres. Calculate the depreciation of the tyres per hour. (05 marks)

Q4. (a) Depreciation computation plays an important role in financial accounting of the projects.

i. Define "Depreciation" of an asset. (03 marks)

ii. Describe in detail the 'straight line depreciation' method to calculate the depreciation. (03 marks)

iii. A total construction cost for a building is Rs. 40000000/=. Find the depreciated value after 20 years. Assume total life of building to be 50 years. Scrap value is taken as 10% of the capital cost. (03 marks)

(b) Two alternative highway schemes have been proposed and both are expected to deliver improvements and time savings.

Option A – Require Rs. 10 million initial expenditure to realize benefits worth of Rs. 2.5 million per annum for the following four years.

Option B – Require Rs. 5 milion in initial expenditure to realize benefits worth of Rs. 1.5 million per annum for the following 4 years.

A discount rate of 3.5% is selected for the project.

i. State the factors in general that affect the interest rate. (03 marks)

ii. Calculate the Net Present Values (NPV) for options A and B. (05 marks)

iii. Make your recommendations based on the NPVs obtained. (03marks)

Q5.

(a) Discuss two (02) elements that are critical for establishment of a civil wrong amounting to a 'tort' . (05 marks)

(b) Define a civil engineering 'contract' and explain what is meant by a 'breach of contract'.

(05 marks)

(c) Briefly explain how a crime connected with the construction industry is dealt with in the 'Courts' system of Sri Lanka. (05 marks)

(d) Describe two types of Contract commonly used in the construction industry. (05 marks)

Q6.

(a) What are the aspects with regard to building construction, covered by the rules and regulations of a local government authority? Assume that the construction project is located within a highly congested prime residential area of a municipal council. (05 marks)

(b) Discuss the cost implications of the design variables; 'plan shape', 'size' and 'height' of buildings. (05 marks)

(c) Describe the different types of site documents and records that need to be maintained on a construction site and the processes involved. (10 marks)

Q7.

(a) List and briefly explain the steps a contracting organization has to follow in tendering for a construction project from the time of obtaining a tender document until submission of the bid.
(08 marks)

(b) Explain the factors to be considered when calculating the profit on incomplete contracts.
(04 marks)

(c) Outline the methods used by construction firms to obtain Internal Finance and External Finance. (04 marks)

(d) "Winning a tender in a contracting organization will entirely depend on the profit component" Briefly explain. (04 marks)

Q8.

(a) The Institution for Construction Training & Development 'Conditions of Contract' come under five headings. Name the headings and briefly explain each. (04 marks)

(b) Explain the Contractor's general responsibilities as per the ICTAD Conditions of Contract
(08 marks)

(c) Name the documents contained in a set of bidding documents. (04 marks)

(d)Explain the terms 'Bid Bond' and 'Performance Bond'. (04 marks)