THE OPEN UNIVERSITY OF SRI LANKA
DEPARTMENT OF CIVIL ENGINEERING
Bachelor of Technology (Engineering)

Final Examination - 2005

CEX 6239/ CEU 4307 - Construction Management

Time Allowed : **Three Hours**

Date: 23rd March 2006 Time : 0930-1230 hrs.

Answer any four (4) questions.

Q1.

(a) Describe with relevant examples, the importance of having proper channels of communication within a construction organization

(10 marks)

(b) Explain the terms 'Project Manager' and the 'Project Management Process"

(10 marks)

(c) Show in a diagrammatic form the interdependent and interrelated factors influencing the effectivencss of the management process, in an Organisation Structure.

(05 marks)

Q2.

(a) When selecting Construction materials handling Plant, there are three material handling methods, which may be able to guide us in the selection. Describe the three methods giving examples of Plant.

(10 marks)

(b) Draw a detailed Process Chart for selection of Construction Plant. Explain the Preliminary Selection Procedure in detail.

(10 marks)

(c) What are the basic cost elements of the Owning & Operating costs of equipment?

(05 marks)

Q3.

The Table 1 gives a Contractor's budget of a project together with the profit distribution.

Table 1. Project budget and profit distribution

Month	1	2	3	4	5	6	7	8	9	10
Value of work each month ('000,000 Rs)	2	3	4	8	9	9	8	5	4	2
Profit (% of Cost)	6	6	6	6	6	6	6	10	10	10

The interim measurements are to be made monthly.
Payment of the amount certified less 10% retention, is to be paid to the Contractor one month later.
Half the retention is included in the final certificate on virtual completion and the other half is released six months later.
Assume a delay of one month between the contractor's cost liability and the outward cashflow.

Determine the monthly net cashflow.

Comment on the Cash Flow and demonstrate one method for improving the initial cash flow.

(25 marks)

Q4.

(a) Concrete is transported to the second floor slab of a building, using 2 wheel-barrows, two labourers and hoist. The operator on the second floor will unload a wheel barrow of concrete, wheel it to site and return to hoist. The hoist will carry the wheel barrows up and down. The bottom operator will unload, wheel to concrete, fill and reload wheel barrows.

From time study the following standard times for various activities has been established.

Hoist to go up / down one floor	= 5 sec.
Unload one empty wheel barrow from hoist	= 10 sec.
Load one full wheel barrow onto hoist	= 15 sec.
Wheel empty barrow to concrete	= 5 sec.
Fill one empty wheel barrow & wheel to hoist	= 20 sec.
Unload full wheelbarrow from hoist	=15 sec
Wheel one full wheel barrow to site & return to hoist	= 25 sec.
Load one empty wheel barrow to hoist	=10 sec
Volume of one wheel barrow	= 0.1 cubic m

(i) Construct a multiple activity chart for the present method.

(12 marks)

(ii) Devise one improvement to increase the output without using only wheel barrows and labour.

(05 marks)

(b)

A private construction company needs finance to operate. Briefly discuss the main external sources of finance available .

(08 marks)

Q5.

(a) It is required to construct a security room at the entrance of the Open University, having a plinth area of 10 sq.m. The room consists of load bearing walls, R.C.C. slab, internal and external plaster with two coats of paint and cement rendered floor. The room is required in 45 days.

(i) Identify the activities and draw a realistic Bar Chart. (10 marks)

(ii) Draw the activity-on-arrow network for the project & identify the critical path.

(05 marks)

(b) Give the advantages/disadvantages of the following types of Contract, using examples from the Construction Industry.

(i) Fixed Price Contracts (with and without quantities)

(ii) Design & Build Contracts

(10 marks)

Q6.

(a) Identify the problems in materials handling encountered in building repair and renovation projects. Discuss the guidelines to be used in designing suitable handling systems.

(10 marks)

(b) Describe the 'Hours saved system' as an Incentive Scheme for operating a production bonus for a construction project. Why is it more suitable than other schemes in use?

(05 marks)

(c) Assuming a 75-100 scheme, if a bricklayer is able to lay 60 bricks per hour at standard performance, he is entitled to a bonus of 33 1/3% his basic rate of payment. The bricklayer is engaged on building drainage man holes each containing 840 bricks. Calculate the bricklayer's earnings when his performance is 50P and 100P. 100P is the standard performance. The basic rate of payment is Rs.60.00 per hour.

(10 marks)

Q7.

(a)

(i) Discuss the damages for breach of Contract, amount of Liquidated damages and Limit of liquidated damages for a construction project in relation to Clause 47 of ICTAD Conditions of Contract.

(06 marks)

(ii) ICTAD Conditions of Contract provide provisions for ensuring the progress of work. Identify the Clauses, which deal with the 'Role of the Contractor' and 'progress'.

(06 marks)

(b)

Discuss the advantages of the activity-on-node network over the activity-on-arrow network, using network diagrams of a suitable example.

(05 marks)

(c)

Discuss the concept of 'Value Engineering' and the procedure to be followed in producing an optimal design.

(08 marks)