

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



**Final Examination - 2007/08**

CEX 6239 Construction Management

Time Allowed : Three Hours

Date: 17<sup>th</sup> May 2008

Time : 0930-1230 hrs.

**Answer any four (4) questions.**

**Q1.**

- (a) It is important to provide 'Sufficient Sector Workloads' in order to develop a healthy construction industry. List the different sectors and sub-sectors of construction activities in the construction industry. Discuss the reasons for insufficient workloads and identify factors helpful in facilitating work loads of sufficient capacity. (10 marks)
- (b) Clearly define the difference between 'Project Manager' and the 'Project Management Process'. (05 marks)
- (c) Explain the function of the 'Organisation Structure' in the Project Management process by drawing a suitable organization chart for a medium scale road construction project. Indicate the Interdependent & Interrelated factors in an organization structure with respect to External influences and internal processes, by means of a diagram. (10 marks)

**Q2.**

- (a) A "Cost Data Bank" is a collection of useful cost data regularly updated and frequently used for decision making; whether it be for 'Estimating', 'Planning' or 'Monitoring'. What are the major objectives of developing a cost data bank? What are the three important factors to be determined? Explain in detail how you would develop a cost data bank for a contracting organization highlighting the important considerations. (10 marks)
- (b) The Open University of Sri Lanka has recently advertised a tender notice for the construction of an Examination Hall at Nawala. Discuss the role of the following personnel in the Contractor's office, in the 'Estimating and Tendering' process for the above project:
  - (i) In-house design staff,
  - (ii) Estimators,
  - (iii) Plant managers,
  - (iv) Proposed staff for construction and
  - (v) Purchasing staff
 (10 marks)
- (c) List the documents to be included in the "Bidding Documents". (05 marks)

**Q3.**

(a) The following table gives a set of activities for an Urban Planning project.

Event No.	Activity Name	Activity	Duration in weeks	Preceded by	Followed by
1.	Finalising requirements of the Local Authority	A	1	None	B,E
2.	Organising and training of the socio-demographic surveyor	B	1	A	C
3.	Socio-demographic survey	C	3	B	E
4.	Physical survey & preparation of maps	D	4	None	E
5.	Planning land use & infrastructure	E	2	A,C,D	F
6.	Design of infrastructure, buildings & structures with drawings	F	2	E	G
7.	Taking off measurements & obtaining required quantities, preparing Tender Documents (QS work)	G	1	F	H
8.	Finalising report	H	2	G	None

Draw the activity-on-arrow diagram and the activity-on-node diagram for the project, indicating the critical path on both diagrams.

(10 marks)

(b) Define the word 'rating' as applied to work related to brickwork in building construction. Discuss factors which will affect the 'rating' and the 'observed time' of the selected worker.

(10 marks)

(c) Identify the difference between preference shares and ordinary shares

(05 marks)

**Q4.**

(a) Problems in the handling of materials and structural elements on a construction site need to be considered at the planning stage of a building construction project. Describe factors to be considered in this regard when planning machinery and other equipment for a project.

(15 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? What are the main problems in using this scheme for construction work? Explain giving simple examples.

(10 marks)

Q5.

- (a) What are the two major items of information required at the pre- tender stage in order to prepare a cash flow forecast? Explain how these information help in evaluating the Value vs Time curve. (05 marks)

- (b) The following table gives a Contractor's budget of a project together with the profit distribution.

Month No.	1	2	3	4	5	6	7	8	9	10
Value of work ('000,000)	1	1.5	2	4	4.5	4.5	4	2.5	2	1
Profit (% of value)	5	5	5	6	6	6	10	10	10	10

Monthly retention is 10% with half the retention included in the final certificate on completion and balance released six months later.

Interim measurements are to be made monthly and bill payment to be made one month later.

Assume an average credit facility of one month for cost transactions.

Determine the monthly cash-in and cash-out and indicate on a graph for clarity. Clearly state all assumptions made.

What is the maximum amount of borrowing needed for the project and when is it required?

(20 marks)

Q6.

- (a) Who could be the two main parties to a 'Contract' to construct a public hospital for Nugegoda? Name all the others who would be involved in the contract.

(05 marks)

- (b) Discuss the advantages and disadvantages of using 'Fixed Price Contract' and 'Design and Build Contract' for the above construction.

(10 marks)

- (c) What are the principles of ascertaining liquidated damages under our legal system?

(10 marks)