



**THE OPEN UNIVERSITY OF SRI LANKA**  
 DEPARTMENT OF CIVIL ENGINEERING  
 CONSTRUCTION MANAGEMENT PROGRAMME - LEVEL 7  
 POST GRADUATE DIPLOMA / STAND ALONE COURSES

**Final Examination - 2006/07**

CEX 7101, CEP 2101/CEE 7101 - Planning and Control in the Construction Industry

Time Allowed: Three Hours

Date: 6<sup>th</sup> March 2007

Time: 0930-1230 hrs.

Section A and Section B consist of three questions each.  
 Select two (2) questions from each section and answer a total of four (04) questions.

**Section A**

**Q1.**

(a)

The construction industry of a developing country depends on several basic factors. One such factor is the rate of growth of the economy and the rate of investment. Discuss in relation to Sri Lanka.

(15 marks)

(b)

Explain the effects of 'indirect employment' generated by the construction industry.

(10 marks)

**Q2.**

(a)

Labour intensive public works offer a number of potential advantages to developing countries. What are these advantages to a country like Sri Lanka. Compare with the disadvantages.

(15 marks)

(b)

Outline some of the constraints encountered in developing the indigenous building materials industry of Sri Lanka

(10 marks)

**Q3.**

(a) If national planning is to succeed, Private and Public sectors need to interface closely. Explain why this is always not possible thus resulting in ineffective planning.

(10 marks)

(b) Discuss the advantages of decentralized planning, budgeting and programme coordination for development activities, as seen at Provincial, District and Divisional levels.

(15 marks)

**SECTION B**

**Q4.**

(a) Discuss the Client's role in Planning and Control of a project.

(06 marks)

(b)

A project's characteristics are presented here.

Activity	Predecessors	Duration	Workers/day
A	None	3	9
B	None	5	6
C	None	1	4
D	A	1	10
E	B	7	16
F	B	6	9
G	C	4	5
H	C	3	8
I	D,E	6	2
J	F,G	4	3
K	H	3	7

Completion of I, J and K will end the project.

(i) Draw an activity-on-arrow diagram and show the critical path

(05 marks)

(ii) Draw an activity-on-node diagram indicating early start, late start, early finish and late finish of all activities.

(06 marks)

(iii) Suggest a project schedule that completes the project in minimum time and results in relatively constant or level requirements for labour over the course of the project.

(08 marks)

**Q5.**

(a) Discuss the advantages of using sub-nets in network construction. Illustrate your answer with an example from a road construction project.

(10 marks)

(b) Explain the difference between 'resource allocation' and 'resource aggregation'.

Explain why it is necessary to prepare a set of decision rules for the purpose of allocating resources.

(15 marks)

Q6.

(a) Discuss the advantages of using a line-of-balance technique in certain types of construction. (05 marks)

(b)

Your company has been awarded a contract to construct 30 houses using a target rate of build of four houses per week and each team working at their natural rate.

Table below shows the sequential operations involved in the construction together with the estimated man hours and optimum number of men for each operation.

Operation	Predecessor	Man hours per house	Optimum number of men per operation
A. Substructure	-	120	3
B. Superstructure	Substructure	290	6
C. Internal partitions	Superstructure	250	4
D. Plumber	Internal partitions	40	3
E. Electrician	Internal partitions	30	2
F. Finishes	Plumber, Electrician	220	5

(i) Draw a network of operations and prepare a line of balance schedule.

Assume a five-day working week, eight hours per day, and a minimum buffer time of five days between operations.

(15 marks)

(ii) What is the overall duration of the project? Discuss the steps to be taken in order to reduce the duration.

(05 marks)