

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



Final Examination – 2016/17

CEX7101 - Planning and Control in the Construction Industry

Time Allowed: Three Hours

Date: 9th November 2017

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 National Construction Industry Policy (NCP) aims at achieving an efficient construction industry in Sri Lanka. Give the first five (05) Public Sector responsibilities and explain their implementation mechanism stated in the policy with your comments. (15 marks)
- (b) Describe the 'forward' and 'backward' linkages of the construction industry and also comment on their contribution to the GDP (10 marks)

Q2.

"The success of 'Planning' and 'Progress Control' of a construction project is dependent on the techniques used and on the organizational structure of the company"

- (a) Discuss two (02) types of techniques used for planning the construction of a major road construction project and draw a typical organizational structure for successful implementation. (12 marks)
- (b) Describe a system a contractor could adopt, either by using a planning technique or other, in order to measure performance and hence progress of construction activities on a regular and frequent basis, highlighting possible implementation problems. (13 marks)

Q3.

- (a) Discuss the important planning functions to be considered by the Clients during the appraisal and design stage of a construction project. (10 marks)
- (b) If a project is behind schedule a contractor may choose to do the following;
- (i) increase resources,
 - (ii) introduce overtime working, or
 - (iii) schedule overlapping activities

Discuss the benefits, cost and risks associated with each of these options given above. (15 marks)

Section B

Q4.

(a) State three advantages/disadvantages in using network diagrams over bar charts for construction activities of a road project. (03 marks)

(b) A project has been awarded for the construction of a road of length 25 km. Major activities of the project are identified below.

A-Preliminaries, B-Clearing of road trace, C-Common excavation in earthwork, D-Sub base, E-Base course, F-Bitumen surfacing, G-Shoulder material placing, and H-Culverts

(i) Make approximate assumptions regarding the sequence of items of work and identify realistic durations in weeks for the above activities such that the road can be completed in one year.

Include 'lead' and 'lag' times as deemed necessary.

Note that work on the culverts has to start two weeks after starting on common excavation work.

Prepare a table of activity durations and precedence.

State all assumptions made.

(08 marks)

(ii) Draw a activity-on-node network for the construction of this project indicating activity times, sequence of activities and the critical path. (10 marks)

(iii) Prepare a bar chart based on 'Earliest Event Times' and indicate the Latest Event Times and the floats of activities on the same chart. (04 marks)

Q5.

A tender has been awarded to construct 20 typical houses with a target rate of build of 3 per week. The work consists of operations given below which are considered to be sequential.

A buffer time of 5 days between operations should be assumed.

One week comprises 5 days of 8 hour work each day

The logic diagram to be of sequential operations as a line diagram

Activity	Description	Man Hours per Activity	Optimum number of Men per activity (men in one team)
A	Substructure	110	3
B	Superstructure	320	8
C	Joinery	365	9
D	Plumbing	35	2
E	Finishes	210	5

(a) Draw a network of operations and prepare a Line of Balance schedule.

Hint: You are required to calculate the 'Theoretical Gang size', 'Actual Gang size', 'Actual Rate of output', 'Time in Days' for each activity and 'Time from start of first section to start of last section' for each activity. (20 marks)

(b) What is the overall duration of the project? Suggest ways of reducing the project duration. (05 marks)

Q6.

Write short notes on any four of the following:

- (a) Desirability of using 'Work breakdown structures & Work packages' in the management of small construction projects
- (b) Discuss the advantages of using sub-nets in network construction
- (c) Discuss the importance of developing the domestic building materials industry
- (d) Explain the use of innovative approaches in the preparation of work programmes
- (e) The economic approach to design problem solving in 'design costing & management' for a building project.

(6.25x4 = 25 marks)