THE OPEN UNIVERSITY OF SRI LANKA 00100

Bachelor of Technology (Civil) - Level 6

CEX 6331- Construction Engineering and Management

FINAL EXAMINATION - 2011/2012

Time Allowed: Three (03) hours

Date: 08-03-2012 (Thursday) Time: 0930 - 1230 hrs.

The paper consists of 06 questions. Answer any four (04) questions.

Q1

(a) The purpose of site exploration is to collect complete details of the site in order to enable the designer to take decisions regarding designing of buildings. Explain four such decisions.

(Marks 08)

(b) Name four possible types of material that could be encountered during an excavation for a building which necessitate a deep foundation. Also give equipment/tools which could be used in the excavation of these materials.

(Marks 05)

(c) There are four different types of foundations to transfer structural loads to the ground. Indicate briefly the situations where each one of these is most suitable.

(Marks 06)

(d) What are the four main components of an excavator loader (backhoe loader). Also explain the uses of an excavator loader.

(Marks 06)

Q2

(a) Explain three traffic engineering considerations that need to be incorporated in the design of a road.

(Marks 06)

(b) Describe with sketches a possible method of timbering in a trench of size 2m deep and 1.2m wide for laying underground sewers in moderately firm ground.

(Marks 06)

(c) Write a descriptive note on 'earth compaction' emphasising on the meaning, the benefits and the influence of moisture.

(Marks 07)

(d) Provide short descriptions on the following two types of rollers:

(i) Pneumatic tired rollers
(ii) Smooth wheel rollers

(Marks 06)

Q3

(a) There are number of factors affecting the workability of concrete other than water content. Identify five such factors and explain briefly how they affect the workability.

(Marks 07)

(b) Still quite a number of RC multi-storey buildings are constructed in remote areas where there are no facilities to obtain both ready mixed concrete and concrete pumping. Therefore, taking adequate precautions to maintain the uniform and specified workability of concrete during the entire construction period is important. Explain the site engineer's role in this.

(Marks 05)

(c) Explain why it is necessary to cure concrete during the early stages of hardening. Briefly describe three ways in which curing can be done.

(Marks 07)

(d) Success of a concrete pumping operation depends on the coordination among the main parties involved. Explain the main points that need to be agreed upon by these parties.

(Marks 06)

Q4

A

(a) The maximum height of an earthen dam is governed by three parameters. Explain these parameters.

(Marks 07)

(b) Explain two mechanisms available to control seepage in an earthen dam.

(Marks 06)

B

(a) In relation to a poker vibrator used to compact concrete laid on a slab, explain briefly why it is important

- to insert the poker quickly
- to withdraw the poker slowly
- to avoid sticking the poker into the top of the heap

(Marks 06)

(b) Briefly describe two types of internal vibrators.

(Marks 06)

Q5

A

(a) There are several types of dredgers to be used in different situations. Write a short description about each type emphasising on important features.

(Marks 08)

(b) Briefly explain the factors that affect the performance and selection of a dredger.

(Marks 05)

B

(a) List four types of floor finishes currently being used for flooring. Explain the circumstances under which each floor finish type can best be used.

(Marks 06)

(b) Describe the uses of three types of cement grouts.

(Marks 06)

Q5. A large scale private bank intends to construct a guest house in Matara. The bank awarded the contract to a builder, who decided to adopt network approach to plan and control the construction activities. The builder therefore divided the construction project into a number of activities. The details of these are represented in the following table:

Symbol	Duration (Days)	Activities which immediately	
		Precede	Follow
A	3	None	C
B	5	None	D,E
C	4	A	F,G,H
D	8	B	F,G,H
E	9	B	I
F	5	C,D	J,K,L,M
G	8	C,D	K,L,M
H	6	C,D	I
I	5	E,H	P
J	4	F	N
K	7	F,G	O
L	6	F,G	Q
M	7	F,G	P
N	4	J	R
O	8	K	R
P	4	I,M	R
Q	5	L	R
R	3	N,O,P,Q	None

(a) Draw the activity on arrow diagram for this project.

(Marks 12)

(b) Carry out the forward pass and backward pass calculations on this network, and indicate the critical path. Name three types of floats used in Critical Path Method and compute these for activities C and K.

(Marks 06)

(c) Explain the stepwise procedure of preparing a bar chart.

(Marks 07)