THE OPEN UNIVERSITY OF SRI LANKA
Bachelor of Technology (Civil) - Level 6
CEX 6331- Construction Engineering and Management

FINAL EXAMINATION - 2007

Time Allowed: Three (03) hours

Date: 15-05 -2008 (Thursday) Time : 0930-1230 hrs.

The paper consists of 06 questions. Answer Four (04) questions.

Q1

(a) Explain what is understood by 'compaction of soil'. Also explain how you can use water to obtain the optimum degree of compaction of clayey soil.

(Marks 08)

(b) Name three different equipment used for compacting earth. Briefly state the specific use of each one of them.

(Marks 05)

(c) There are different types of foundation to transfer structural loads to the ground. Briefly indicate situations where each one of these is best used.

(Marks 06)

(d) Explain two different methods available for ensuring stability and safety in closed excavation. Also discuss their advantages and disadvantages in detail.

(Marks 06)

Q2

(a) Testing of cement can be divided into two categories; Field testing and Laboratory testing. Briefly explain different field tests carried out when cement is used for minor works.

(Marks 07)

(b) Describe what you understand by the term 'workability' related to concreting. Also explain the factors affecting workability of concrete.

(Marks 06)

(c) Write short explanatory notes on the following two terms related to concreting:

(i) Water cement ratio
(ii) Segregation

(Marks 06)

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

(Marks 06)

Q3

A

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

(Marks 08)

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

(Marks 07)

B

(a) List situations where rock drilling is required.

(Marks 04)

(b) There are three methods of producing holes in rock. Write a short description about each type.

(Marks 06)

Q4

A

(a) Draw a cross section of an earth dam and mark all the important features.

(Marks 06)

(b) Explain what is meant by the following terms in relation to an earth dam

(i) Horizontal drain
(ii) Toe filter
(iii) Core

(Marks 06)

B

(a) Describe different types of cracks in concrete and how they can be identified.

(Marks 05)

(b) Name and describe different types of joints found in water retaining structures. Draw sketches for each of these joints

(Marks 08)

Q5

A

(a) Briefly explain different civil engineering applications of grout.

(Marks 06)

(b) Name and explain three types of commonly used grout.

(Marks 07)

B

(b) Explain briefly with reasons as to why presence of air voids within set reinforced concrete is harmful.

(Marks 06)

(c) The effective use of poker vibrator is very important to obtain the optimum compaction. Write down in point form what precautions poker vibrator operator can take in this regard.

(Marks 06)

Q6. The Table shown below gives a break down of activities associated with a building project. Also it depicts the precedence relations and durations of each activity.

Symbol	Activity	Immediate predecessors	Durations days
A	Mobilization		3
B	Excavation	A	4
C	Concreting	B	2
D	Erect Frames	C	4
E	Lay brick work	D	6
F	Install basement drains	C	1
G	Concrete basement floor	F	2
H	Roof plumbing	F	3
I	Roof wiring	D	2
J	Heating and ventilation	D,G	4
K	Fasten plaster board	I, J,H	10
L	Lay flooring	K	3
M	Fixed kitchen fixtures	L	1
N	Finish plumbing	L	2
O	Finish carpentry	L	3
P	Finish roofing	E	2
Q	Finish gutters	P	1
R	Lay storm drains	C	1
S	Sand and varnish flooring	O,T	2
T	Paint	M,N	3
U	Finish electrical work	T	1
V	Finish grading	Q, R	2
W	Landscaping	V	5

(a) Draw the activity on arrow diagram for this project. Carry out the forward pass and backward pass calculations on this network, and indicate the critical path.

(Marks 15)

(b) Name three types of floats used in Critical Path Method and compute these for activities C and K.

(Marks 04)

(c) Explain the purpose and way of carrying out the Resource smoothening operation.

(Marks 06)