THE OPEN UNIVERSITY OF SRI LANKA
Bachelor of Technology (Civil) - Level 6
CEX 6331/CEU4301– Construction Engineering and Management

FINAL EXAMINATION - 2005

Time Allowed : Three (03) hours

Date: 2006 - 04 – 20 (Thursday) Time : 1330 - 1630 hrs.

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

Q1.

(a) Prepare a list of site preparation services that are required for a large multi storey construction project.

(Marks 05)

(b) The preparation of job layout (site layout) for any project is decided on the individual project requirements. Prepare a job layout for a typical tunnel construction project.

(Marks 06)

(c) Material storage is an important aspect under site planning and so receives site engineers' special attention. If you are the site engineer for four storied building project, explain the precautions that need to be taken in providing for material storage

(Marks 08)

(d) Explain why it is important to carryout out a site investigation for multi-storey building prior to the design phase.

(Marks 06)

Q2.

(a) Explain why it is necessary to remove entrapped air (voids) from fresh concrete.

(Marks 07)

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

(Marks 05)

(c) Explain why it is necessary to cure concrete during the early stages of hardening. Briefly describe special features of currently used curing methods in the local construction industry.

(Marks 07)

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

(Marks 06

Q3.

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

(Marks 06)

(b) Name three different roller types used for compaction. Briefly indicate their modes of action, advantages and disadvantages.

(Marks 09)

(c) Sheet piling is more effective than timber in supporting sides of a trench excavation. Do you agree with this statement? Justify your answer.

(Marks 05)

(d) List five important components of an aggregate crushing plant. Briefly state the primary function of each these components.

(Marks 05)

Q4.

A

(i) Describe the principle modes of load transfer in relation to piles. Illustrate your answer with sketches.

(Marks 06)

(ii) Explain both the advantages and disadvantages of using cast-insitu piles over precast piles with reference to Sri Lankan construction conditions.

(Marks 06)

B

(i) Write a short description about different types of cracks in concrete. Your answer should include how they are formed and identified. Illustrate your answer with sketches.

(Marks 07)

(ii) Name and describe different types of joints used in water retaining structures. Illustrate your answer with sketches.

(Marks 06)

Q5

A

(i) There are two widely used methods for tunnel construction. What is the method popular in Sri Lanka? Explain the reasons for its popularity.

(Marks 07)

(ii) There are several methods of attacking the face of tunnels driven through rock. List four common methods and explain any two in detail. Illustrate your answer with sketches.

(Marks 06)

B

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

(Marks 06)

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

(ii) Briefly describe two types of internal vibrators

(Marks 06)

Q6.

A large private company wishes to construct a guesthouse in Kandy. The company awarded the contract to a builder who decided to use network approach to plan and control the construction activity. The builder therefore, divided the construction project into number of activities. The details of these activities are depicted in the Table below;

Symbol	Activity description	Immediate preceding activity	Duration Days
A	Development of the site	-	16
B	Foundation with Pillars	A	10
C	Crawl space plumbing	B	02
D	Air conditioning and Heating	B	02
E	Water heater	C	02
F	Walls, ceiling and rough roofing	D	14
G	Rough plumbing	E,F	06
H	Rough wiring	E,F	04
I	Heating and AC ducts	E,F	05
J	Doors and windows	E,F	03
K	Exterior siding	J	03
L	Interior wall finishing	G,H,I	10
M	Finish roofing	K	10
N	Finish flooring	L	06
P	Plumbing and drainage	M	02
Q	Kitchen and bathroom finishing	N	03
R	Finish carpentry	N	05
S	Finish painting	Q,R	06
T	Finish electrical and interior decoration	S	03
W	Landscaping	P	04
X	Handing over	T,W	01

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

(Marks 12)

(b) Carry out the forward pass and backward pass calculations on this network, and indicate the critical path.

(Marks 04)

(c) Explain the different situations where different types of dummy activities are used.

(Marks 03)

(d) Explain the purposes of carrying out following two operations associated with project planning;

Resource scheduling
Resource smoothening

(Marks 06)