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

077

FINAL EXAMINATION - 2008

Time Allowed: Three (03) hours

Date: 24-03 -2009 (Tuesday) Time: 1400 - 1700 hrs.

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

Q1

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

(Marks 05)

(b) Describe tamping rollers and smooth wheel rollers placing a special emphasis on their applications.

(Marks 08)

(c) Explain four parameters which influence the degree of compaction achieved by a vibratory roller.

(Marks 06)

(d) Name and explain four elements of a flexible pavement.

(Marks 06)

Q2

(a) In a particular project where a large volume of concrete work is to be handled, the consultant engineer requires the site engineer to maintain the uniform workability of concrete throughout the construction. Explain how the site engineer attached to this project can ensure this.

(Marks 07)

(b) Write short notes on the following terms related to concreting:
(i) Compaction
(ii) Bleeding

(Marks 06)

(c) Why is it necessary to cure concrete work during the early stages of hardening? Briefly explain two commonly adopted methods of curing.

(Marks 06)

(d) The effective use of poker vibrator is very important to obtain the optimum compaction. Write down in point form the precautions an operator of a poker vibrator should take in order to obtain the optimum compaction.

(Marks 06)

Q3

(a)

(i) Briefly explain the function of a 'coffer dam'. What points should be kept in mind when constructing a coffer dam.

(Marks 07)

(ii) List down the types of coffer dams and explain the factors which affect the selection of each type.

(Marks 05)

(b)

(i) Explain briefly what purposes are served by formwork erected to support fresh concrete and what standards are expected of them

(Marks 07)

(ii) Discuss the advantages of steel formwork over timber formwork.

(Marks 06)

Q4.

(a)

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

(Marks 06)

(ii) Explain both the advantages and disadvantages of using cast-insitu piles over precast piles.

(Marks 06)

(b)

(i) Write a short description about different types of cracks found 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) Explain four techniques (or equipment) that can be used to increase the efficiency and economy in making precast elements?

(Marks 06)

(ii) Briefly outline the techniques available to facilitate connection and fixing of precast elements.

(Marks 07)

(b)

(i) Briefly explain the methods available to attack the face of a tunnel driven through rock?

(Marks 05)

(ii) Discuss the advantages of using the 'drift method' of driving a tunnel.

(Marks 07)

Q6. A reactor and storage tank are interconnected by an insulated process line that needs periodic replacement. You are the maintenance and construction superintendent responsible for this project. The works engineer has requested your plan and schedule for a review with the operating supervisor. The precedents and crew requirement for each activity have been determined using data obtained from projects.

Symbol	Activity description	Duration Days	Precedents
A	Develop required material list	8	-
B	Procure pipe	200	A
C	Erect pipe	12	-
D	Remove scaffold	4	I , M
E	Deactivate line	8	-
F	Prefabricate sections	40	B
G	Place new pipes	32	F, L
I	Fit up pipe and valves	8	G, K
J	Procure valves	225	A
K	Place valves	8	J
L	Remove old pipe and valves	35	C, E
M	Insulate	24	G, K
N	Pressure test	6	I
O	Clean-up and start-up	4	D, N

(a) Draw the activity on arrow diagram for the implementation of the project plan.

(Marks 12)

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

(Marks 04)

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

(Marks 02)

(d) Explain the purpose and the way to carry out following two operations associated with project planning;

Resource scheduling
Resource smoothening

(Marks 07)