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THE OPEN UNIVERSITY OF SRI LANKA
Bachelor of Technology (Civil) - Level 6
CEX 6331- Construction Engineering and Management
FINAL EXAMINATION - 2016/2017
Time Allowed: Three (03) hours

Date: 24-11-2017 (Friday) Time: 0930 - 1230 hrs.

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

Q1.

(a) Site mobilisation is a process that can be accomplished in stages. With reference to a bridge construction project, briefly explain the tasks involved in different stages while highlighting the principal tasks carried out at each stage.

(Marks 07)

(b) Explain the external factors to be considered at the planning stage for site mobilisation.

(Marks 06)

(c) Show the importance of providing 'site preparation and services' effectively in a new highway construction project by taking the following two services;

- plant maintenance workshop and standing area
- material storage

(Marks 06)

(d) Write a descriptive note on a 'smooth wheel roller'.

(Marks 06)

Q2.

(a) Explain how the sub soil investigation benefits a design engineer intending to design a multistory building.

(Marks 07)

(b) Explain the factors that need to be taken into consideration in providing support to an excavation.

(Marks 06)

(c) There are three different actions through which compaction effort (energy) can be applied to a soil layer to attain compaction. Explain these actions while emphasising on the equipment which offer these actions and the type of soil for which these actions are suitable.

(Marks 06)

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

(Marks 06)

Q3.

(a) Explain separately how size and shape of coarse aggregates affect the properties of concrete.

(Marks 06)

(b) What do you understand by 'concrete mix design'? Explain why design mixes are needed in a construction project.

(Marks 07)

(c) Describe the contractor's role in planning the site for concrete pumping operation of a building construction.

(Marks 06)

(d) Write an explanatory note on external vibrators (clamp on) emphasising on their installation and operation.

(Marks 06)

Q4.

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

(Marks 07)

(b) Out of the three methods available for producing holes in rock only two are applicable for deep holes. Write a description on each of these two methods.

(Marks 06)

(c) Name five types of joints used in manual arc welding and illustrate each with a sketch.

(Marks 06)

(d) Describe any three types of connections adopted to connect precast elements. Use sketches to illustrate your answer.

(Marks 06)

Q5.

(a) Describe, stepwise, how the progress control of construction was administered in any of the projects you have been associated with.

(Marks 06)

(b) Explain four advantages of planning in relation to any construction project.

(Marks 06)

(c) Explain how Maslow's hierarchy of needs can be applied by a project manager to motivate subordinates.

(Marks 07)

(d) Explain briefly different semi financial incentives and financial incentive schemes used in construction industry illustrating with examples.

(Marks 06)

Q6. A large scale private bank intends to construct a guest house in Matara. The bank awarded the contract to a builder, who decids 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	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.

(Marks 04)

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

(Marks 03)

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

(Marks 06)