



FINAL EXAMINATION - 2013/2014

Time Allowed: Three (03) hours

Date: 21-08-2014 (Thursday)

Time: 0930 - 1230 hrs.

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

Q1

- (a) Write three important factors that should be considered in the preparation of a job layout plan. Prepare a job layout for a 15 storied building to be constructed facing a busy street in a city. (Marks 08)
- (b) Write a short descriptive note on 'excavation of trenches'. (Marks 05)
- (c) There are three different actions through which 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) Provide short descriptive notes on the following two types of rollers;
- (i) Sheep foot roller
(i) Smooth wheel roller (Marks 06)

Q2

- (a) Draw a cross section of a flexible pavement, indicate the key elements and explain any four key elements. (Marks 07)
- (b) Machinery used for roadwork are generally similar to the machinery used in a dam site. List five additional machinery specially used for roadwork, and indicate their main use. (Marks 05)
- (c) Explain how 'quality control and tolerances' of a flexible pavement construction is achieved. (Marks 06)
- (d) Name four possible types of material that could be encountered during an excavation for a building which calls for a deep foundation. Also give equipment/tools which could be used in the excavation in these materials. (Marks 07)

Q3

- (a) There are a number of factors affecting the workability of concrete other than the water content. Identify five such factors and explain briefly how they affect the workability.
(Marks 06)
- (b) Still quite a number of RCC multi-storey buildings are constructed in remote areas without having facilities to get both the ready mixed concrete and concrete pumping. Therefore, taking adequate precautions to maintain the uniform and specified workability of concrete is important during the entire construction period. Explain comprehensively the site engineer's role in this.
(Marks 08)
- (c) Write an explanatory note on external vibrators (clamp on) emphasising on their installation and operation.
(Marks 05)
- (d) Success of a concrete pumping operation depends on the coordination among the main parties involved. Explain the main concerns that need to be agreed upon by these parties during all stages of concrete pumping operation.
(Marks 06)

Q4

- (a) List five important components of an aggregate crushing plant. Briefly explain the primary function of each component.
(Marks 07)
- (b) Describe the principle modes of load transfer in load bearing plies, identifying advantages of each mode. Illustrate your answer with sketches.
(Marks 06)
- (c) There are several types of dredgers to be used in different situations. Write a short description about each type, emphasising on important features.
(Marks 07)
- (d) Explain two mechanisms available to control seepage in an earthen dam.
(Marks 05)

Q5

- (a) Explain, separately, four advantages of 'planning and progress control', in relation to any construction project.
(Marks 06)
- (b) Describe the uses of three types of cement grout.
(Marks 06)



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

(Marks 07)

(d) Explain the characteristic features of the following types of contracts:

Fixed price with quantities

Design and Build

Cost reimbursement

(Marks 06)

Q6.

The table below lists activities for constructing a bridge over an operational railway line:

Activity Number	Activity Description	Duration (Months)	Predecessors
A	Detail site investigation and survey	2	-
B	Detail Planning	6	A
C	Detail design	6	B
D	Preparation of site	4	C
E	Relocate services	3	C
F	Re-align overhead track electrification	4	C,E
G	Access road and ramp construction	1	D
H	Piling	2	G
J	Construct foundations and abutments	3	H
K	Construct temporary supports to support bridge deck during construction	2	F,G
L	Fabrication planning of structural steel components	2	C
M	Manufacture structural steel components (off-site)	2	L
N	Transport structural steel components and erect on-site	1	M
P	Erect pylons and fill with concrete	2	J
Q	Construct main span deck on pre-cast concrete beams	3	H,K,N,P
R	Install cable-stays and lift deck off temporary supports	3	Q
S	Remove temporary support	1	R
T	Electrical system installation	1	S
U	Roadway surfacing (paving)	2	S
V	Finishing and ancillaries	2	T,U
W	Commissioning-cut -over	1	V
X	Formal hand-over and ceremony	1	W
Y	Project Sign-off	1	X
Z	Administrative closure	1	W

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

(Marks 16)

(b) Compute the three main types of floats for activity 'K'.

(Marks 03)

(c) Explain the purpose of the following two operations emphasising how they would be carried out;

Resource scheduling

Resource smoothing

(Marks 06)

