00108

The Open University of Sri Lanka
Faculty of Engineering Technology
Department of Civil Engineering

Study Programme	: Bachelor of Technology Honours in Engineering
Name of the Examination	: Final Examination
Course Code and Title	**: CVX4532/CEX4232 Construction Engineering & Planning**
Academic Year	: 2019/20
Date	: 26th July 2020
Time	: 0930-1230hrs
Duration	**: 3 hours**

General Instructions

1. Read all instructions carefully before answering the questions.
2. This question paper consists of **Eight (8)** questions in Four **(4)** pages.
3. Answer any **Five (5)** questions only. All questions carry equal marks.
4. Select at least two (2) questions from each section, answer a total of five (5) questions. All questions carry equal marks.
5. Answers for sections A & B should be submitted on separate sheets with section A and Section B written respectively on the answer scripts.
6. Answer for each question should commence from a new page.
7. Relevant charts/ codes are provided.
8. This is a Closed Book Test (CBT).
9. Answers should be in clear hand writing.
10. Do not use Red colour pen.
11. Write down your Index Number clearly on the answer script.

Section A

(01)

(a) Explain what is meant by 'curing' of the concrete cast at site and the reasons why it should be done. (5 marks)

(b) List and explain all the factors which influence the 'workability' of freshly mixed concrete. (5 marks)

(c) Explain what is meant by 'durability of concrete' and the precautions that should be taken at site to ensure the durability of a concrete structure. (5 marks)

(d) Explain the terms 'entrapped air' in concrete and 'entrained air' in concrete mixes. (5 marks)

(02)

(a). Explain what is meant by the term 'soil compaction' in relation to civil engineering. (5 marks)

(b). Write down the factors which influence the degree of soil compaction while briefly explaining them. (5 marks)

(c). Briefly describe the procedure for filling & compacting earth works. (5 marks)

(d). State the four (4) different methods available for specifying soil compaction to the contractor. Discuss their advantages and drawbacks. (5 marks)

(03)

(a). Explain the difference between 'rigid pavements' and 'flexible pavements' in highway construction. (5 marks)

(b). Draw a neat sketch of a typical 'climbing tower crane', labeling main components of it. (5 marks)

(c). Describe the two basic types of poker vibrators, explaining the difference of their vibratory function. (5 marks)

(d). Provide a neat labeled sketch of a manhole and explain the usage of it. (5 marks)

(04)

(a) Draw a diagram showing a typical wiring and switching system with having switches & bulbs. Indicate 'live' and 'neutral' wires clearly in the diagram. (5 marks)

(b) There are three types of electric wiring installation used in domestic buildings. Briefly explain what these are. (5 marks)

(c) Lamps used for lighting of domestic buildings can be either (i) filament type, or (ii) fluorescent type. Briefly explain the two types. (5 marks)

(d) List the five types of lamps commonly available. Briefly describe each of them. (5 marks)

Section B

(05)

(a) Name the four (04) levels of construction planning. Then briefly explain how these four levels of planning relate to (i) Macro planning level, and (ii) Micro planning level. (6 marks)

(b) Clearly explain the reasons for conducting 'progress control' in a construction site. (4 marks)

(c) Describe the most commonly used techniques of 'progress control'. Explain with the aid of diagrams how such techniques can be used effectively in a construction site to monitor progress. (6 marks)

(d) "There are so many different parties involved in a construction project and benefits of 'progress control' are dependent on the party who adopts it". Discuss this statement. (4 marks)

(06)

The following table gives a set of activities taken from a project concerned with construction of a playground. The duration, precedence of each activity and requirement of resource 'A' is given in the table in relation to each activity.

Activity	Duration (weeks)	Preceding activity	Requirement of Resource 'A' (per week)
A	3	-	4
B	1	-	5
C	3	A	6
D	4	A	4
E	4	B	5
F	5	B	3
G	2	C,E	3
H	3	F	1

(a) Explain the benefits of using Critical Path Method (CPM) as a project monitoring and controlling technique. (4 marks)

(b) Draw the activity on arrow network diagram for the given project and carryout the backward pass and forward pass to determine the early start time (EST), late start time (LST), early finish time (EFT) and late finish time (LFT) for each activity. (4 marks)

(c) Determine total float, independent float and free float for each activity and present them in tabular form. Also mark the critical path on the network. (4 marks)

(d) Draw the resource 'A' histogram for the above project. (4 marks)

(e) Explain how you perform 'resource smoothening' operation for the weekly requirement of resource 'A'. (4 marks)

(07)

(a) Discuss the importance of providing first aid facilities at construction projects. (7 marks)

(b) Accident prevention measures are vital in construction projects. There are different practices for promoting occupational safety and health at construction sites. Explain how these can be implemented at sites. (6 marks)

(c) Identify eight commonly occurring accidents in a multi-storey building construction site. Suggest precautions or improvements to prevent each of the identified accidents from occurring. (7 marks)

(08)

(a) Explain the types of maintenance in relation to construction plant and equipment. (7 marks)

(b) List four (4) most commonly used machines for earth excavations and briefly explain each type. (7 marks)

(c) Discuss the benefits that a firm owning construction equipment can derive by adopting a proper inventory control system. (6 marks)