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UNIVERSITY EXAMINATION

CONCRETE TECHNOLOGY

ECV 2104

DIPLOMA IN CONSTRUCTION MANAGEMENT

DIPLOMA IN BUILDING TECHNICIAN

DIPLOMA IN CIVIL ENGINEERING

SECTION A [40 Marks]

1. Define the following terms in relation to concrete technology

Concrete

(2 marks)

Segregation

(2marks)

Curing

(2 marks)

2. State **three** methods used in curing of concrete

(3 marks)

3. Outline **two** significance of aggregates in concrete.

(2marks)

4. Define the term "workability" in the context of concrete.

(1mark)

5. Discuss how workability is measured and why it is important

(4marks)

6. Discuss the role of water-cement ratio in concrete mix design, considering how it affect the properties of concrete
(5marks)

7 . Analyze the desirable properties of aggregates and how they affect concrete performance
(5marks)

8. Outline **four** methods that can be adopted for compacting concrete
(4 marks)

9. Compare concrete with the following building materials with respect to structural properties and durability.
(4marks)

Steel

Wood

10. Explain the purpose of adding admixtures to concrete mixes and provide **two** examples of common types of admixtures with their functions. (6marks)

SECTION B [60 Marks]

11. State **six** reasons for use of precast concrete units 3marks

b) Outline four factors that determine the location of construction joints
4marks

c) Sketch and label the following joints in construction
Contraction joint (7marks)

Expansion joint
(6marks)

12. Outline **three** causes of Concrete defects
(3 marks)

b) You're overseeing the construction of a concrete sidewalk. Upon inspection, you notice surface cracks developing along its length.

What could be causing the surface cracks in the concrete sidewalk? (5marks)

b) Discuss any **four** defects in concrete (12 marks)

13. In a scenario where concrete needs to be placed underwater for a marine structure, what special considerations and techniques would you employ to ensure proper placement and curing?
(10marks)

- b) State **four** measures to be taken into account when concreting in hot weather (4marks)
- c) Discuss **three** advantages and **three** disadvantages of using plant in transporting concrete (6marks)

14. You are tasked with designing a pre-stressed concrete beam for a bridge with a long span.

- a) Discuss the advantages of pre-stressed concrete compared to conventionally reinforced concrete for this application. (10marks)
- b) Distinguish between pre tensioning and post tensioning of concrete units (10marks)