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CIVIL ENGINEERING LEVEL 6

CON/OS/CET/CC/04/6/A

APPLY CONSTRUCTION MATERIALS SCIENCE

July/August 2024

TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION COUNCIL (TVET CDACC)

WRITTEN ASSESSMENT

TIME: 3 HOURS

INSTRUCTIONS TO CANDIDATE

1. This paper has two sections A and B.
2. Answer ALL the questions as guided in each section.
3. You are provided with a separate answer booklet.
4. Marks for each question are indicated in the brackets.
5. Do not write on the question paper.

This Paper Consists of THREE (3) Printed Pages.

Candidates should check the question paper to ascertain that all pages are printed as indicated and that no pages are missing

SECTION A (40 MARKS)

Answer ALL questions.

1. As a material technologist, you are to classify aggregates into their two main categories. Describe TWO categories you would classify the aggregates. (4 Marks)
2. Within the realm of construction, timber finds numerous applications. List FIVE uses of timber. (5 Marks)
3. Asphalts play a key role in the construction of flexible pavements. State THREE forms of asphalts found in the construction industry. (3 Marks)
4. Paint, serving as a finishing material, comprises a combination of diverse constituents. Outline FOUR constituents of paint. (4 Marks)
5. A high-quality building stone must possess several essential properties to fulfill its intended function effectively. Describe FIVE requirements found in a good building stone. (5 Marks)
6. Tar, derived from fractional distillation, has high viscosity and versatility, rendering it suitable for construction applications. List the THREE types of tar. (3 Marks)
7. Admixtures are integral in enhancing the quality of paint, playing a pivotal role in its formulation. State FOUR types of admixtures giving their function. (4 Marks)
8. As bricks are manufactured locally, they offer a cost-effective and good quality construction material. Outline FOUR main constituents of a good brick earth. (4 Marks)
9. To augment the aesthetic allure of buildings, tiles are installed, serving as an indispensable component of the finishing touches. Describe are FIVE characteristics of a good building tile. (5 Marks)
10. Gladding refers to the process of installing tiles or other decorative materials on surfaces, typically walls, to enhance their appearance and provide protection. Outline THREE properties of a good cladding material. (3 Marks)

SECTION B (60 MARKS)

Answer THREE questions.

11. Timber that has undergone processing and preparation for utilization in construction or other assorted applications. An eminent application of timber lies in framing structures, notably in the construction of buildings. Consequently, timber assumes a pivotal role within the construction industry, underscoring its significance as a fundamental construction material necessitating thorough comprehension.
    a. Outline SEVEN properties of good timber. (7 Marks)
    b. Describe FIVE reasons for seasoning timber (5 Marks)
    c. Discuss the FOUR methods used in artificial seasoning of timber. (8 Marks)
12. Clay is mixed with water to form a plastic viscous mass which has a property of retaining its shape when moulded and dried.
    a. Describe FIVE steps followed in the preparation of clay bricks. (10 Marks)
    b. Explain the TWO types of moulding used to create bricks. (6 Marks)
    c. Outline FOUR qualities of a good brick. (4 Marks)
13. Cement serves as a binding agent, usually in powdered form, comprising finely ground minerals. Its principal application lies in concrete, where it functions as a binder, amalgamating aggregates like sand and gravel. Moreover, cement is utilized in mortar for bricklaying and plastering walls.
    a. Explain the TWO processes used in the manufacturing process of cement. (10 Marks)
    b. State FOUR properties of good cement. (4 Marks)
    c. Describe THREE field tests can be carried out to determine quality cement (6 Marks)
14. Quarrying stands as a pivotal method for extracting stones from their natural beds, serving as a significant source of construction materials.
    a. Discuss the FOUR methods of Quarrying. (8 Marks)
    b. Explain SIX types of stone dressing a stone. (12 Marks)

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