



ZIMBABWE

**MINISTRY OF HIGHER AND TERTIARY EDUCATION,
INNOVATION, SCIENCE AND TECHNOLOGY DEVELOPMENT**

**HIGHER EDUCATION EXAMINATIONS COUNCIL
(HEXCO)**

NATIONAL CERTIFICATE

IN

CIVIL ENGINEERING

**SUBJECT: Civil Engineering Materials and
Laboratory Practices – (Theory)**

PAPER NO: 313/18/S10

DURATION: 2 hours

MARCH/APRIL 2022 EXAMINATION

REQUIREMENTS

1. Answer booklet
2. Writing pen

INSTRUCTIONS TO CANDIDATE

1. Answer all questions.
2. Each question carries 20 marks.

This paper consists of 3 printed pages.

PAPER NO: 313/18/S10 – CIVIL ENGINEERING MATERIALS AND LABORATORY
PRACTICES - THEORY

QUESTION 1

- a) i) What is your understanding of the term 'concrete?' (4 marks)
- ii) State the factors affecting workability of concrete. (4 marks)
- b) i) Describe the measures you will take to control bleeding in fresh concrete. (6 marks)
- ii) Explain the importance of admixtures in concrete. Give examples. (6 marks)

QUESTION 2

- a) Give an outline of the properties of steel. (5 marks)
- b) Describe the advantages of steel used in design and construction. (5 marks)
- c) Outline the treatment done to steel to prevent corrosion. (5 marks)
- d) List at least five (5) standard sectional sizes of steel used for constructional reinforcement. (5 marks)

QUESTION 3

- a) State the precautions to be taken when working in a laboratory.
- b) Describe the properties of the following construction.
- | | |
|---------------------------|-----------|
| i) Asphalt | (3 marks) |
| ii) Brick | (3 marks) |
| iii) Cement | (3 marks) |
| iv) Brick force materials | (3 marks) |
| v) Dump proof material | (3 marks) |

QUESTION 4

- a) Describe the uses of timber in construction and outline the properties of timber. (10 marks)
- b) State the defects found in timber during seasoning and suggest ways of avoiding them. (10 marks)

QUESTION 5

- a) Briefly explain the uses of paints in the construction industry. (8 marks)
- b) i) Describe the types of plastics used in the construction industry. (6 marks)
- ii) Outline the advantages and disadvantages of each. (6 marks)

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