



ZIMBABWE

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

**HIGHER EDUCATION EXAMINATIONS COUNCIL
(HEXCO)**

NATIONAL DIPLOMA

IN

CONSTRUCTION ENGINEERING

MODULE: Mechanical Construction

PAPER NO: 527/23/M05

DURATION: 3 Hours

JUNE 2026 EXAMINATION

REQUIREMENTS

Answer Booklet

INSTRUCTIONS TO CANDIDATES

Answer any five (5) questions.

This paper consists of 3 printed pages.

QUESTION 1

Draw the diagrams of one pipe and two (2) pipe systems of drainage. (20 marks)

QUESTION 2

- a) Write down any five (5) principles of drainage. (10 marks)
- b) Enumerate the advantages of plastic as a drainage material. (4 marks)
- c) Draw diagrams to show:
 - i) Self-siphonage. (2 marks)
 - ii) Induced siphonage (2 marks)
 - iii) Back siphonage (2 marks)

QUESTION 3

- a) Justify the presence of aluminium sulphate in sedimentation tanks. (3 marks)
- b) Draw a diagram showing the purification of water by chlorination. (8 marks)
- c) Identify any three (3) factors which determine the capacity of a geyser. (3 marks)
- d) Draw a diagram to show the connection of domestic water from the mains to the kitchen sink. (6 marks)

QUESTION 4

- a) Identify six (6) the advantages of solar energy. (6 marks)
- b) Write down three disadvantages of solar power. (6 marks)
- c) Draw a diagram of a photo-voltanic panel connected to a TV set. Label the following:
 - i) Charge controller
 - ii) PV panel
 - iii) Inverter
 - iv) Battery (8 marks)

QUESTION 5

- a) Describe the following services:
 - i) Ventilation (2 marks)
 - ii) Air conditioning (2 marks)
- b) Draw an automatic viscous impingement air filter. (6 marks)
- c) Identify five (5) advantages of air conditioning. (10 marks)

QUESTION 6

- a)
 - i) Write down four factors which determine the size of gutters and down pipes. (4 marks)
 - ii) Explain how water may be harvested from roofs and paved areas. (4 marks)
- b) Justify the advantages of combining storm water and foul water into one drain. (4 marks)
- c) Explain the usage of run-off rain water from paved areas. (4 marks)
- d) Identify any four materials used to manufacture rainwater goods. (4 marks)

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