



ZIMBABWE

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

**HIGHER EDUCATION EXAMINATIONS COUNCIL
(HEXCO)**

NATIONAL CERTIFICATE

IN

FABRICATION ENGINEERING

SUBJECT: Workshop Technology II

PAPER NO: 324/18/S01B

DURATION: 3 Hours

MARCH/ APRIL 2025 EXAMINATION

REQUIREMENTS

- 1) Answer booklet
- 2) Non programmable scientific calculator

INSTRUCTIONS TO CANDIDATE

- 1) Section A: This section consists of six (6) questions. Answer five (5) questions only. Each question carries eight (8) marks.
- 2) Section B: This section consists of four (4) questions. Answer three (3) questions only. Each question carries ten (10) marks.
- 3) Section C: This section is compulsory. The question carries (30) marks.

SECTION A

QUESTION 1

- a) With reference to hand tools, briefly describe the following:
- i) Draw filing technique. (3 marks)
 - ii) Cross section filing technique (3 marks)
- b) List any two (2) precautions to be taken when caring about files. (2 marks)

QUESTION 2

With reference to templates, briefly explain the following templates:

- a) Box templates (2 marks)
- b) Batten templates (3 marks)
- c) Bushed steel templates (3 marks)

QUESTION 3

With reference to heat-treatment briefly describe the following terms:

- a) Hardening (2 marks)
- b) Tempering (3 marks)
- c) Quenching (3 marks)

QUESTION 4

With reference to corrosion, briefly explain the following terms:

- a) Pitting corrosion (2 marks)
- b) Galvanic corrosion (3 marks)
- c) Crevice corrosion (3 marks)

QUESTION 5

With reference to joining and fastening, sketch the following:

- a) Flat washer (2 marks)
- b) Taper washer (2 marks)
- c) Square form type of thread (2 marks)
- d) Acme form type of thread (2 marks)

QUESTION 6

With reference to quality control, briefly explain the following destructive testing methods:

- a) Tensile method (4 marks)
- b) Charpy impact testing method (4 marks)

SECTION B

QUESTION 7

With reference to welding processes describe the principle of submerged Arc Welding (SAW), with the help of a diagram. (10 marks)

QUESTION 8

- a) With reference to Oxy-Acetylene gas welding, briefly explain the right ward gas welding technique, with the aid of a diagram. (6 marks)
- b) Name any four (4) advantages of the righward gas welding technique. (4 marks)

QUESTION 9

- a) With reference to metal grinding, briefly explain the following terms:
 - i) Abrasive (2 marks)

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- ii) Grit (2 marks)
 - iii) Grade (2 marks)
 - iv) Structure (2 marks)
- b) Name any two (2) constituents of a grinding wheel. (2 marks)

QUESTION 10

With reference to platework, briefly describe the following, with the aid of a diagram.

- a) Roll-up type machine (5 marks)
- b) Roll-down type machine (5 marks)

SECTION C

QUESTION 11

- a) With the aid of sketches, differentiate between a universal beam and universal column. (4 marks)
- b) Illustrate and label the following structural connections:
 - i) Beam to beam connection (4 marks)
 - ii) Beam to stanchion connection (5 marks)
- c) With reference to structural work, illustrate and briefly explain the stages in forming a castellated beam. (9 marks)
- d) Draw and label a portal frame. (8 marks)

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