higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

ENGINEERING TECHNOLOGY
NQF LEVEL 2

(6021012)

2 March 2020 (Y-paper)
13:00–16:00

REQUIREMENTS: ONE A4 drawing sheet

This question paper consists of 6 pages and 1 addendum.

151Q1S2002

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TIME: 3 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer all the questions.
2. Read all the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. All sketches must be neat and in proportion.
5. Start each question on a new page.
6. Write neatly and legibly.

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QUESTION 1: GENERAL

1.1 Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question number (1.1.1–1.1.5) in the ANSWER BOOK.

1.1.1 A thermometer is used to measure the …

A distance from one point to another.
B temperature of a body.
C vertical height of a building.
D quantity of water delivered by a pump.

1.1.2 A straight line from one side of a circle to the other passing through the centre is known as …

A the volume.
B the radius.
C the diameter.
D an ellipse.

1.1.3 The purpose of a straight edge is to …

A support a structure.
B compare the straightness of a surface.
C check horizontal and vertical levels.
D draw lines.

1.1.4 Which lines can be used to indicate the hidden detail in first-angle orthographic projection?

A Object lines
B Dimension lines
C Centre lines
D Broken lines

1.1.5 When using an orbital sander …

A use a dust mask and goggles.
B push the sander hard.
C use one hand to wipe the dust off.
D keep overalls clean.

(5 × 1) (5)

1.2 Choose a description from COLUMN B that matches a term in COLUMN A. Write only the letter (A–F) next to the question number (1.2.1–1.2.5) in the ANSWER BOOK.

COLUMN A		COLUMN B	
1.2.1	Ratchet	A	action required when drilling into masonry
1.2.2	Switch	B	used to loosen and tighten bolts and nuts
1.2.3	Oil	C	used to turn a tool on and off
1.2.4	Hammer	D	reduces friction
1.2.5	Ram	E	guided shaft used to exert pressure
		F	hollow shaft that fits over another shaft

(5 × 1) (5)

1.3 Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (1.3.1–1.3.5) in the ANSWER BOOK.

1.3.1 Expansion is the increase in volume of a gas, liquid or solid.

1.3.2 Bore is the internal diameter of a cylinder.

1.3.3 A clock gauge is used for telling time.

1.3.4 A gauge is used to measure the amount of something.

1.3.5 Bisect means to divide or cut in half.

(5 × 1) (5)

1.4 Give ONE term for each of the following descriptions by writing it next to the question number (1.4.1–1.4.5) in the ANSWER BOOK.

1.4.1 Amount of light emitted by a source and measured in candela

1.4.2 Process used to identify cracks on a grinding wheel

1.4.3 Used to measure the thread pitch of a bolt

1.4.4 Flow of free electrons in a circuit

1.4.5 Used mainly to support most workpieces when marking off

(5 × 1) (5)

[20]

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QUESTION 2: ENGINEERING HAND TOOLS

2.1 List FIVE engineering hand tools that a hardware store would sell. (5)

2.2 Give the purpose of taps and list THREE types of taps in the sequence that it is used. (2 + 3) (5)

2.3 Give FOUR reasons why hacksaw blades will break. (4)

2.4 List FIVE safety measures to adhere to when using a chisel. (5)

2.5 Which procedure must be followed to declare a hammer with a cracked handle unserviceable? (1)

[20]

QUESTION 3: ENGINEERING POWER TOOLS

3.1 List SIX power tools found in a workshop. (6)

3.2 Give TWO safety precautions to observe when using each of the following power tools:

3.2.1 Angle-grinding machine

3.2.2 Hydraulic press

(2 × 2) (4)

3.3 What is the function of each of the following special tools:

3.3.1 Diamond-tipped wheel dresser

3.3.2 Huntington-type wheel dresser

(2 × 2) (4)

3.4 Give ONE care or maintenance procedure for each of the following power tools:

3.4.1 Compressor

3.4.2 Angle grinder

3.4.3 Pedestal drilling machine

3.4.4 Portable hand-drilling machine

(4 × 1) (4)

3.5 Which equipment or tools can be used to measure each of the following:

3.5.1 Inside diameter of a pipe

3.5.2 Height of a door

(2 × 2) (4)

[22]

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QUESTION 4: ENGINEERING MEASURING EQUIPMENT AND SI UNITS

4.1 What would the weight of an object with a mass of 68 kg be?

HINT: W = m × g (5)

4.2 What does each of the following basic SI units represent?

4.2.1 Kelvin

4.2.2 Ampere

4.2.3 Second

4.2.4 Meter

(4 × 1) (4)

4.3 Explain FIVE main procedures to follow to ensure that measuring equipment last for a long time. (5)

4.4 Name FOUR components of a vernier protractor. (4)

4.5 Give the function of marking off media in the workplace and name THREE types of markings. (2 + 3) (5)

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QUESTION 5: BASIC ENGINEERING DRAWING

The ADDENDUM (attached) shows an isometric view of a machine part.

5.1 Draw, to scale 1:1, the following views in first-angle orthographic projection on an A4 drawing sheet:

5.1.1 Front view (3)

5.1.2 Top view (4)

5.1.3 Left view (3)

5.2 Insert the dimensions in all the views. (3)

5.3 Insert the projection symbol below the left view. (2)

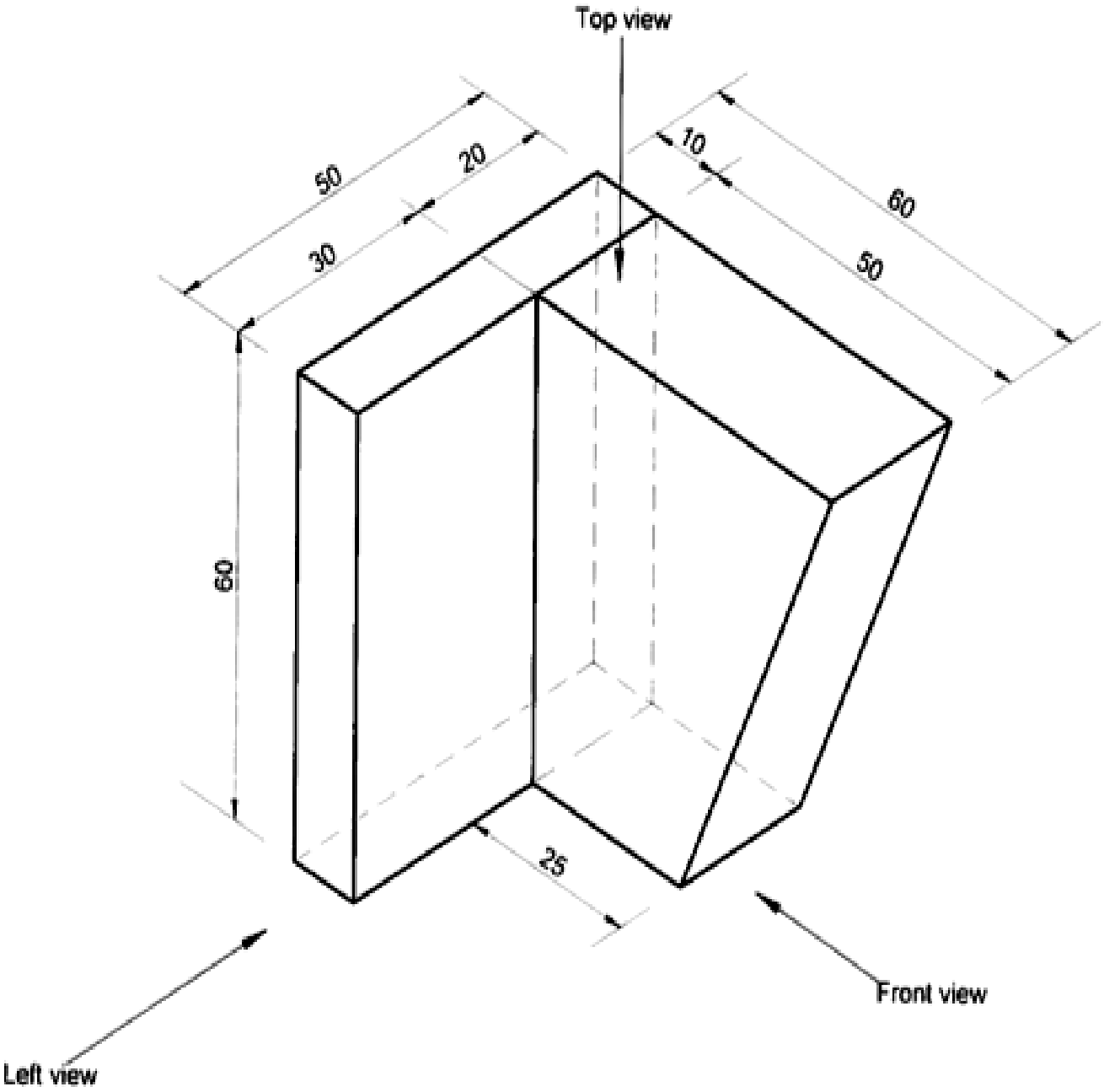
[15]

TOTAL: 100

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ADDENDUM



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