higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

ENGINEERING TECHNOLOGY L2
NQF LEVEL 2

(6021012)

10 DECEMBER 2020 (X-paper)
09:00–12:00

REQUIREMENTS: A4 drawing sheet.

This question paper consists of 6 pages and 1 addendum.

495Q1N2010

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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. Start each section on a new page.
5. Use only a black or blue pen.
6. All sketches must be neat, clean and in proportion.
7. Drawings must be done on the clean A4 drawing sheet provided.
8. Write neatly and legibly.

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SECTION A

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 The purpose of a feeler gauge is …

A for checking diameters.
B to measure a small gap or opening.
C to support a structure.
D to draw lines.

1.1.2 A combination set has THREE heads …

A big head, round head and a small head.
B talking head, spirit head and a scale head.
C square head, centre head and a protractor head.
D parallax head, optical head and a magnifying head.

1.1.3 When doing freehand drawing …

A your one hand must be free.
B the paper must not be taped or clipped.
C the paper must be in the centre of the board.
D check horizontal and vertical levels.

1.1.4 A datum line is …

A where one can get a date.
B a line on a computer.
C a fixed starting point.
D a piece of equipment that measures something.

1.1.5 A dial test indicator is used to …

A tell the time.
B check for depth.
C check for concentricity and roundness.
D to count components that are manufactured.

(5 × 1) (5)

1.2 Choose a description from COLUMN B that matches a word 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	Batch	A	a means to destroy by chemical action
1.2.2	Ram	B	a six-sided figure
1.2.3	Kickback	C	a shallow cut, edge or groove
1.2.4	Hexagonal	D	a guided shaft used to exert pressure
1.2.5	Corrode	E	action of a power tool when it jumps backwards
		F	a set number of things

(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 A burr is a set number of things.

1.3.2 An engineer's square is a set number of things.

1.3.3 A depth micrometer is used to measure the depth of a work piece.

1.3.4 A telescopic gauge is used to see distances.

1.3.5 An odd leg caliper is also called a jenny caliper.

(5 × 1) (5)

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

1.4.1 It is used to scribe large circles on metal.

1.4.2 A turning moment produced by a force.

1.4.3 The internal diameter of a cylinder.

1.4.4 A true vertical position or alignment.

1.4.5 The force produced when one object rubs or rolls against another.

(5 × 1) (5)

TOTAL SECTION A: [20]

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SECTION B

QUESTION 2: ENGINEERING HAND TOOLS

2.1 Your employer asked you to do a job at one of your company's sites.

List FIVE hand tools that you would select to take along in your toolbox. (5)

2.2 There are THREE types of filing operations.

Name the THREE operations and give one type of cut that you would select to file mild steel. (4)

2.3 Spanners are often used incorrectly.

List FIVE ways in which spanners can be used or treated incorrectly. (5)

2.4 Your screwdriver has malfunctioned while in use.

What THREE checks would you do to determine serviceability? (3)

2.5 What is the function of a taper tap? (1)

2.6 Name the TWO tapping stages after the taper tap (2)

[20]

QUESTION 3: ENGINEERING POWER TOOLS

3.1 Different types of power tools are used for different applications.

List SIX power tools that are used in workshops. (6)

3.2 You are about to carry out a drilling operation.

What are the first THREE steps before commencing this operation? (3)

3.3 The speed of a pedestal drilling machine must be changed.

Describe, step by step and in the correct sequence, the SIX steps to be followed to change the speed. (6)

3.4 What is the purpose of the tank (receiver) of a compressor? (3)

3.5 List FOUR safety rules that should be observed when using an angle grinder. (4)

[22]

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QUESTION 4: ENGINEERING MEASURING EQUIPMENT AND S.I. UNITS

4.1 Determine the weight of an electric motor with a mass of 40 kg?

Hint W = m × g. (5)

4.2 Write the unit and symbol for the following quantities.

1. Length

2. Area

3. Volume

4. Mass

(8 × half mark) (4)

4.3 A dial test indicator consists of FOUR components.

Give the purpose of a dial test indicator and name the four components. (5)

4.4 You have won an engineering award and may select FIVE precision measuring instruments from a supplier as your prize.

Name FIVE instruments that you would select. (5)

4.5 Care and maintenance of engineering precision measuring equipment is crucial.

List FOUR care and maintenance procedures for a telescopic gauge. (4)

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QUESTION 5: BASIC ENGINEERING DRAWING

FIGURE 1 on the ADDENDUM (attached) shows an isometric view of a machine part.

Draw the following to scale of 1:1 in first-angle orthographic projection:

5.1 A front view (A) (3)

5.2 A top view (B) (4)

5.3 A left view (C) (3)

5.4 Insert one dimension in each of the views. (3)

5.5 Insert the projection symbol in the space below the left view. (2)

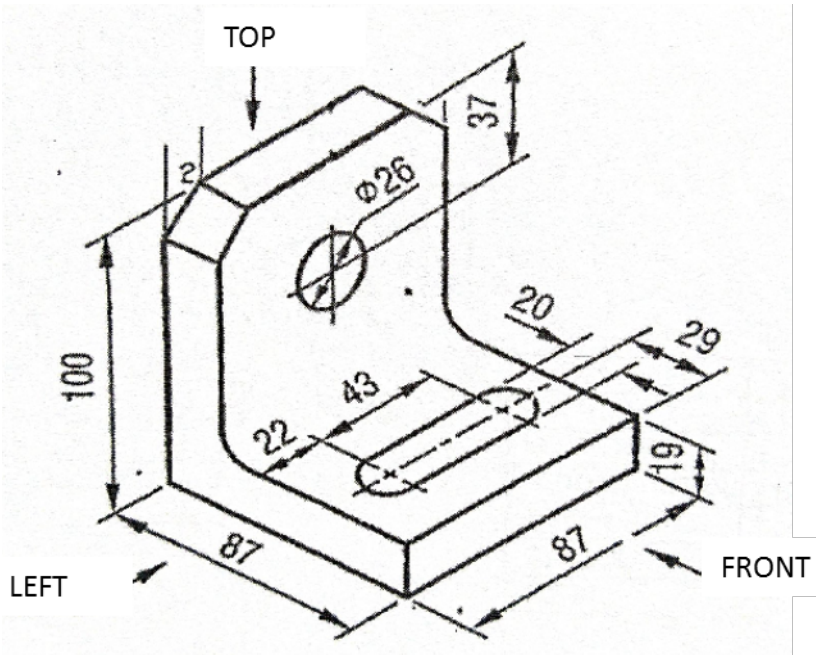
[15]

TOTAL SECTION B: 80
GRAND TOTAL: 100

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ADDENDUM



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