higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

**NATIONAL CERTIFICATE (VOCATIONAL)**

# MECHANICAL DRAUGHTING AND TECHNOLOGY

(First Paper)

**NQF LEVEL 4**

(12050694)

**26 November 2020 (X-paper)**
**09:00–12:00**

**This question paper consists of 4 pages.**

117Q1N2026

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**TIME: 3 HOURS**
**MARKS: 75**

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**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 drawings including candidates' information must be done in pencil.
5. Write neatly and legibly.

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## QUESTION 1

1.1 Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (1.1.1–1.1.4) in the ANSWER BOOK

1.1.1 Bolts and nuts are the same.

1.1.2 An isometric circle and an ellipse are the same.

1.1.3 Dedendum is the radial distance from the pitch of the circle to the outermost point of the tooth.

1.1.4 In SA the main focus is on the systems engineering design model. (4)

1.2 Explain why the scale of a drawing is important. (2)

1.3 Between the following drawing methods which one is the fastest and why?

- Using instruments or
- Using computer software

(4)
**[10]**

## QUESTION 2

2.1 Define the term *pitch.* (2)

2.2 Is drawing a helical square thread the same as drawing a spring? Give a reason for the answer. (1 + 2) (3)

2.3 Write down the formula to calculate the length of a spring. (3)

2.4 Does the number of turns matter when drawing a square thread? Explain the answer. (1 + 3) (4)
**[12]**

## QUESTION 3

3.1 Give THREE advantages of a spur gear. (3 × 2) (6)

3.2 Write down the formula to calculate the pitch circle diameter (PCD). (3)

3.3 Write down the formula to calculate a dedendum. (3)

3.4 Name THREE types of mechanical keys. (3 × 1) (3)
**[15]**

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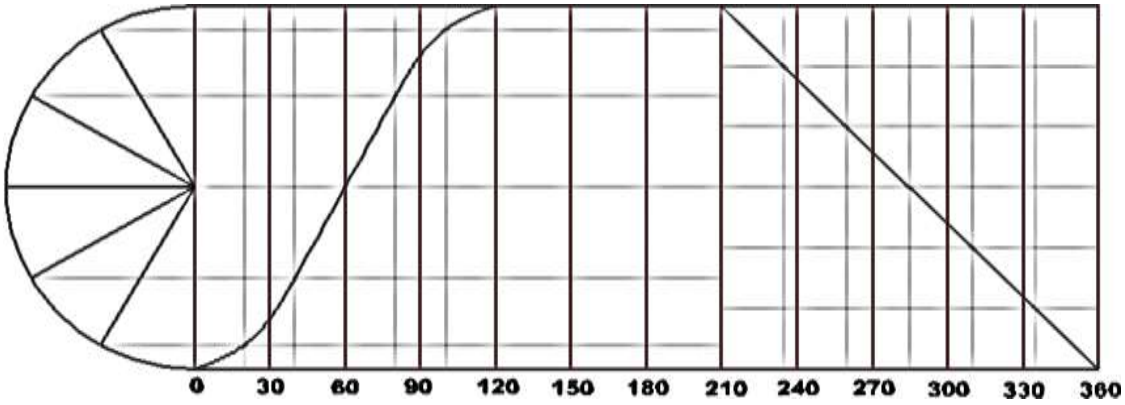
## QUESTION 4

4.1 Where should a displacement diagram be placed? (2)

4.2 Explain how to divide the height of the displacement diagram when using simple harmonic motion. (4)

4.3 Give an explanation of the displacement diagram below:




(18)
**[24]**

## QUESTION 5

5.1 Define *assembling of machine parts.* (3)

5.2 Is the body/frame the main part of model to be assembled? Give a reason for your answer. (1 + 2) (3)

5.3 Give the reason for scheduling a part list on an assembly drawing. (2)

5.4 Define *detail drawings.* (2)

5.5 Besides the point that an assembly drawing should have a parts list, name THREE other important things that should be included on an assembly drawing (3)

5.6 What is the reason why ribs and webs are not sectioned when a cutting plane passes longitudinally through them? (1)
**[14]**

**TOTAL: 75**

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