higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

PROFESSIONAL ENGINEERING PRACTICE
NQF LEVEL 4

16 November 2023

This marking guideline consists of 6 pages.

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QUESTION 1

1.1
1.1.1 B
1.1.2 D
1.1.3 D
1.1.4 B
1.1.5 D

(5 × 1) (5)

1.2
- Because the air and the oceans are warmer, rain patterns change.
- The ice at the poles could start to melt, causing ocean levels to rise.
- Melting ice at the poles reduces the habitat of animals.
- Ocean currents could change, leading to changes of the climate on Earth. (4)

1.3
- Responsibility
- Integrity
- Customer service
- Confidentiality
- Quality of work
- Effective communication with colleagues (Any 4 × 1) (4)

1.4
- Correct company and administrative policies
- Appointing appropriate supervision
- Salary and payment
- Relationships with fellow employees
- Good working conditions
- Emphasising contributions
- Effective communication with colleagues
- Recognition and advancement (Any 4 × 1) (4)

1.5
- Requiring permits for removal of trees and land disturbance.
- Specifying what type of trees and plants are suitable for planting.
- Outline penalties to be paid should the regulations be disregarded.

(3 × 2) (6)

1.6
- Protecting the interest of people and the environment
- Working honestly and responsibly
- Responsibility towards clients and employers
- Upholding the good name and reputation of the professional body

(Any 2 × 1) (2)
[25]

QUESTION 2

2.1 2.1.1 True
2.1.2 False
2.1.3 False
2.1.4 True
2.1.5 True

(5 × 1) (5)

2.2
- Identify the relevant team members.
- Explain the design problem to the team.
- Brainstorming works best with a group of people.
- A whiteboard or flipchart should be used to record all ideas.
- Everyone should be as relaxed as possible.
- The more enjoyable the session, the more ideas develop.
- Encourage the team to generate as many ideas as possible. (Any 5 × 1) (5)

2.3 The team selects the criteria against which to measure the concepts. ✓The criteria is given a weighting according to its importance✓and all the concepts are rated✓ against the set criteria. Finally, the concept with the highest total should be selected as the final solution. ✓

(4)

2.4
- Clarifying objectives
- Establishing functions
- Setting requirements/establishing specifications
- Generating possible solutions
- Evaluating these solutions
- Identify the final possible solution (6)

2.5 2.5.1
- Scale models
- Prototypes
- Mock-ups (3)

2.5.2
- Mathematical model
- Simulation (2)

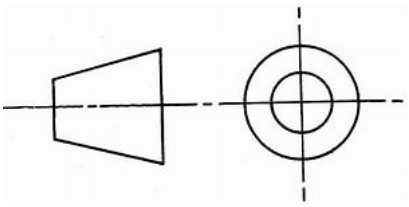
[25]

QUESTION 3

3.1 3.1.1 Tailstock
3.1.2 Student's college
3.1.3 First angle orthographic projection
3.1.4 1:5
3.1.5 Spindle

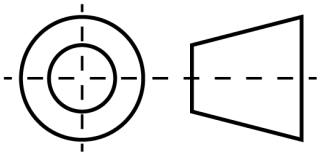
(5 × 1) (5)

3.2 First angle orthographic projection:



✓✓

Third angle orthographic projection:



✓✓ (2 × 2) (4)

3.3 3.3.1 ✓ ✓ ✓
100 – 0,02 = 99,98mm (3)

3.3.2 ✓ ✓ ✓
100 + 0,01 = 100,01mm (3)

3.4
- Block diagram
- Flow chart
- Logical network (3)

3.5 The conclusion section describes✓ the outcomes✓ of the investigation, while the recommendations section suggests✓ ways in which the problem can be resolved. ✓ (4)

3.6
- The company wants to know if the money is spent as intended.
- Colleagues and the other employees will want to know when the new project can be part of their own plans.
- The company will want to know if the project is within the planned budget.
- The company management has to report to shareholders on how the project is proceeding.
- The company's procurement department must know in advance when to procure the required material. (Any 3 × 1) (3)

[25]

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QUESTION 4

4.1 4.1.1 Data
4.1.2 Data processing
4.1.3 Microprocessor
4.1.4 Memory
4.1.5 Hard disks

(5 × 1) (5)

4.2 A – Monitor/Screen
B – Computer
C – Keyboard
D – Mouse
E – Speaker
F – Printer

(6 × 1) (6)

4.3 Low level languages are written in a form that is not far from the language used by machines✓ and is very difficult for humans to understand.✓

High level languages are languages that are intended to be understood by humans.✓ They incorporate commands in a written form that have meaning to a human programmer.✓ (2 × 2) (4)

4.4
- C
- C++
- Cobol
- Visual Basic
- Java
- Delphi

(Any 4 × 1) (4)

4.5 The 'For' loop is created to run in a loop for a specified number of times. ✓ Once the set number of loops have been reached✓ the program exits the loop, ✓ while the 'While' loop is not set for any specified number of turns, ✓ but rather until a set condition is met. ✓ When the set condition is met, the program will exit the loop. ✓ (6)

[25]

TOTAL: 100

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