higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

PROFESSIONAL ENGINEERING PRACTICE
NQF LEVEL 4

12 November 2024

This marking guideline consists of 6 pages.

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QUESTION 1

1.1
- Usage of public transport and carpooling.
- Avoid releasing dangerous gases like carbon dioxide into the atmosphere.
- Re-using and recycling products.
- Avoid burning garbage and smoking.
- Avoid using firecrackers. (5)

1.2
- Respirational and cardio complications
- Global warming
- Acid rain
- Eutrophication
- Diminution/ depletion of the ozone layer (4 × 1) (4)

1.3
- Respiratory conditions
- Heart diseases
- Cancer
- Temporary symptoms e.g. sneezing. (Any 2 × 1) (2)

1.4
- Radioactive waste from nuclear facilities requires special handling due to its long-lasting radioactivity.
- Improper disposal of radioactive waste can lead to contamination of soil, water and air.
- Health risks include radiation exposure, increased cancer rates and genetic mutations.
- Long-term consequences affect ecosystems, future generations and global safety. (Any 3 × 2) (6)

1.5 A professional body is an organisation that exists to further a particular profession,✓ to maintain standards,✓ and to represent the interests of its members.✓ (3)

1.6
1.6.1 Permeability
1.6.2 trees
1.6.3 productivity
1.6.4 Contamination
1.6.5 Compensation

(5 × 1) (5)

[25]

QUESTION 2

2.1
- Identify the problem
- Research in depth
- Brainstorming possible solutions
- Evaluating and selecting a promising solution
- Creating a prototype
- Testing and troubleshooting
- Making improvements and releasing the final product (7)

2.2
- Quality and reliability
- Cost and implications
- Safety and risk
- Reputation and trust
- Operational efficiency
- Regulatory and compliance issues
- Financial impact (Any 5 × 1) (5)

2.3
- Clearly state the problem
- Gather relevant information
- Brainstorm and create potential solutions
- Evaluate and choose the option (4 × 2) (8)

2.4
2.4.1 True
2.4.2 True
2.4.3 False
2.4.4 False
2.4.5 True

(5 × 1) (5)
[25]

QUESTION 3

3.1
3.1.1 A line graph is effective when you want to present trends or changes over a continuous period, like sales performance over months.

3.1.2 If your goal is to compare quantities or values across different categories, such as sales figures for various products, a bar graph is suitable.

3.1.3 To represent the percentage distribution of expenses in a budget, a pie chart divides the total into segments, each corresponding to a category.

(3 × 2) (6)

3.2
- Vertical lines are drawn vertically.
- Horizontal lines in the width and depth planes are shown at 30 degrees to the horizontal.
- Lines parallel to the three axes are at their true (scale) lengths.
- Non-parallel lines won't be their true length. (4)

3.3
- Block diagram
- Flow charts
- Behavioural models
- Input-output descriptions (Any 3 × 1) (3)

3.4
- You structure the entire report from the title to sub-sections and conclusion before filling in the content.
- Start by outlining the main sections, including the introduction, methodology, results and conclusion.
- Then, gradually populate each section with relevant information.
- This method provides a clear roadmap for organising your report. (4 × 2) (8)

3.5
- Enhanced communication
- Increased visibility
- Transparency
- Accountability (4)

[25]

QUESTION 4

4.1
- Lawfulness, fairness and transparency
- Purpose limitation
- Data minimisation
- Accuracy
- Storage limitation
- Integrity and confidentiality
- Accountability (Any 5 × 1) (5)

4.2 4.2.1
- RAM is the most well-known type of computer memory.
- It serves as a temporary storage area for data and instructions that the CPU needs to access quickly during program execution. (Any 1 × 2)

4.2.2
- ROM non-volatile memory, meaning it retains data even when the computer is turned off.
- It contains firmware or permanent instructions that the system uses during boot-up. (Any 1 × 2)

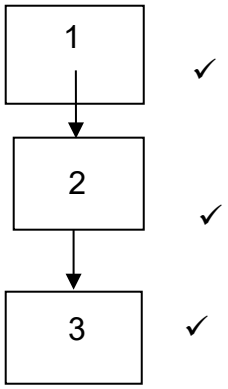
4.2.3
- Is a high-speed, small-sized memory that sits between RAM and CPU.
- It stores frequently accessed data to reduce the time needed for CPU fetch operation. (Any 1 × 2)

4.2.4
- Hard-disk drive is a magnetic storage device that accesses data using mechanical platters and a moving read/write head.
- It provides long-term storage for files, applications and the operating system. (Any 1 × 2)

4.2.5
- Virtual memory is an extension of RAM.
- When RAM is insufficient, the operating system uses a portion of the hard drive as virtual memory.
- It swaps data between RAM and disk to manage memory demands. (Any 1 × 2)

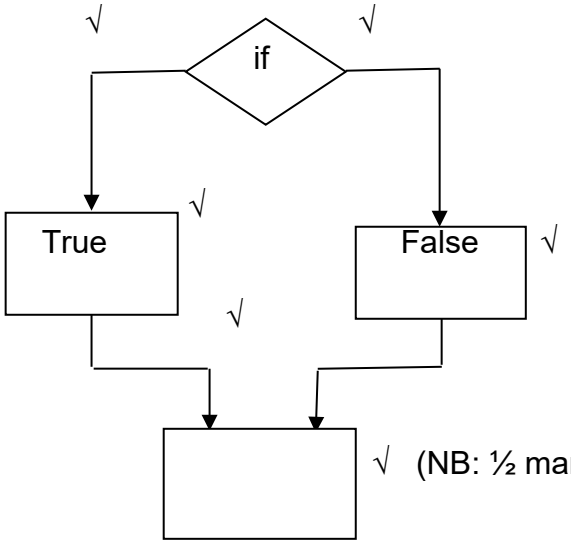
(5 × 2) (10)

4.3 4.3.1



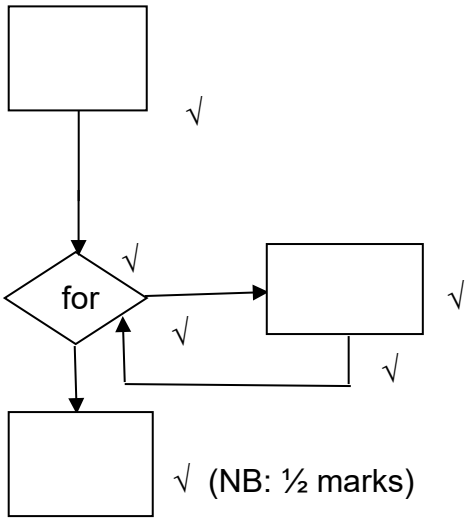
✓ ✓ ✓

4.3.2



√ √ √ √ √ √ (NB: ½ marks)

4.3.3



(3 × 3) (9)

4.4 It is a single unit of the table (one box). (1)
[25]

TOTAL: 100

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