higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

PROFESSIONAL ENGINEERING PRACTICE
NQF LEVEL 4

(6021014)

12 November 2024 (X-paper)
09:00–12:00

This question paper consists of 5 pages.

101Q1N2412

Copyright reserved

DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)
PROFESSIONAL ENGINEERING PRACTICE
NQF LEVEL 4
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. Use only a black or blue pen.
5. Write neatly and legibly.

Copyright reserved

QUESTION 1

1.1 There are some important measures that can be adopted by individuals to contribute towards the prevention of air pollution.

List FIVE important preventive measures that can be adopted. (5)

1.2 Some contaminants may both be primary and secondary. Both are emitted directly and formed from other primary pollutants.

Mention FOUR effects of air pollutants. (4)

1.3 Name TWO negative health effects of hazardous waste. (2)

1.4 Explain THREE effects of waste dumping with specific references to atomic disposals. (3 × 2) (6)

1.5 Define a *professional body* with regards to an institution/organisation. (3)

1.6 Complete the following sentences by writing only the missing word or words next to the question number (1.6.1–1.6.5) in the ANSWER BOOK.

permeability; compensation; trees; productivity; contamination; plants disinfecting; purify; landslide; catchment area; incineration.

1.6.1 … is the ability of materials such as rocks, sponges, etc. to allow fluids to seep through it.

1.6.2 Windbreakers are fences or rows of … used to lessen the force of the wind.

1.6.3 Generally, … becomes less when employees are not happy.

1.6.4 … is the result of indiscriminate crop spraying or unsafe storing of atomic waste.

1.6.5 … is something received for work performed.

(5 × 1) (5)

[25]

QUESTION 2

2.1 Identify SEVEN main steps in the design process. (7)

2.2 Not adhering to an acceptable design process can have significant repercussion across various domains.

Mention FIVE of these effects. (5)

2.3 Explain the main steps in the design process under the following headings:

2.3.1 Defining the problem

2.3.2 Assemble data and research

2.3.3 Develop solutions

2.3.4 Test and select solutions

(4 × 2) (8)

2.4 Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (2.4.1–2.4.5) in the ANSWER BOOK.

2.4.1 The first step in the design process is to define the problem.

2.4.2 Flow charts are often used in quality control.

2.4.3 In order to select the best concept, it is not necessary to construct a selection matrix.

2.4.4 A scale model is a larger model of the final product.

2.4.5 Mathematical models use equations and theoretical predictions to predict an outcome.

(5 × 1) (5)

[25]

QUESTION 3

3.1 A presenter must be aware of both the *requirements* of the topic to be discussed and the *needs* of the audience.

Explain the type of graphs as indicated below:

3.1.1 Line graphs

3.1.2 Bar graphs

3.1.3 Pie charts

(3 × 2) (6)

3.2 An isometric drawing is a type of pictorial drawing that represents an object in three dimensions.

Mention FOUR key features of an isometric drawing. (4)

3.3 Identify THREE different system representations in manufacturing, engineering and technology. (3)

3.4 There are different approaches you can consider for compiling reports.

Discuss the top-down approach. (8)

3.5 List FOUR reasons why reporting is important in various stages of a project. (4)
[25]

QUESTION 4

4.1 Mention FIVE key principles to keep in mind when handling and processing personal data. (5)

4.2 Discuss the functions of the following memory devices used in the engineering field:

4.2.1 Random access memory

4.2.2 Read-only memory

4.2.3 Cache memory

4.2.4 Hard-disk drive

4.2.5 Virtual memory

(5 × 2) (10)

4.3 Show, by means of diagrams, the following structured programming:

4.3.1 Consecutive

4.3.2 Branching (the 'IF' statement)

4.3.3 Loops (the 'FOR' loop)

(3 × 3) (9)

4.4 Explain the term *cell* when referring to a spreadsheet. (1)
[25]

TOTAL: 100

Copyright reserved