higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

ROADS
NQF LEVEL 2

(12030152)

22 November 2024 (Y-paper)
13:00–16:00

This question paper consists of 5 pages.

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)
ROADS
NQF LEVEL 2
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. Write neatly and legibly.

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QUESTION 1: BASIC CONCEPT AND ROAD BUILDING TERMINOLOGY

Define each of the following road terminology terms:

1.1 Bitumen sprinkler

1.2 Aggregates

1.3 Formation level

1.4 Cut

1.5 Fill

(5 × 2) **[10]**

QUESTION 2: ROAD SURVEYING

2.1 Give ONE function of each of the following concepts used in road construction:

2.1.1 Center line

2.1.2 Level

2.1.3 Horizontal curve

2.1.4 Right angle

2.1.5 Gradient

(5 × 1) (5)

2.2 List FIVE steps in which the 3,4,5 method is applied in road construction. (5)

2.3 Describe FIVE steps in which the slope and level of the ground is determined during road construction. (5)

2.4 Name THREE sections that must be checked when setting out a road. (3)

2.5 What is a deflection angle and how should it be set? (2)

[20]

QUESTION 3: SOIL, GRAVEL AND ROAD BUILDING TERMINOLOGY

3.1 List THREE types of material used to strengthen soil during road construction. (3)

3.2 Give THREE functions of each of the following soil types used in road construction.

3.2.1 Gravel

3.2.2 Sand

(2 × 3) (6)

3.3 Why should soil not have too much moisture during compaction? (1)

3.4 Differentiate between *optimum moisture content* and *moisture content* of soil. (4)

3.5 Determine the moisture content of the soil sample with the following information:

Mass of container = 175 g
Mass of wet soil and container = 3125 g
Mass of dry soil and container = 2987 g (5)

3.6 Define *liquid limit.* (1)

[20]

QUESTION 4: INTRODUCTION TO ROAD DRAINAGE

4.1 Give FIVE important factors to consider when road drainage facilities are planned. (5)

4.2 Give THREE reasons why water should not be allowed to collect on the surface of a road. (3)

4.3 Name THREE main sources of subsurface water. (3)

4.4 Name FOUR types of drains used to control subsurface water. (4)

4.5 Where would each of the following drains be used?

4.5.1 Kerb inlet

4.5.2 Catch-water drain

4.5.3 Edge drain

4.5.4 Gutter

4.5.5 Channel

(5 × 1) (5)

[20]

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QUESTION 5: EARTHWORKS

5.1 List FIVE ways to prevent people falling over material and incomplete construction work on a site. (5)

5.2 Give FIVE reasons why cave-ins occur on the side of an excavation. (5)

5.3 Name FIVE major safety elements that must be carefully planned and directed by construction companies. (5)

5.4 Briefly describe the function of each of the following construction plants:

5.4.1 Bulldozer

5.4.2 Grader

5.4.3 Back-actor hydraulic

5.4.4 Compactor

5.4.5 Trencher

(5 × 1) (5)

5.5 Explain the correct use of a plate compactor to compact soil. (3)

5.6 Name TWO pieces of equipment used to compact soil. (2)
[25]

QUESTION 6: LAYERING

6.1 Name FOUR different types of road layers. (4)

6.2 What is a *fill*? (1)
[5]

TOTAL: 100

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