higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

ROADS
NQF LEVEL 3

(12030363)

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09:00–12:00

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 3
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.

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QUESTION 1: BUILDING TERMINOLOGY

1.1 Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (1.1.1–1.1.10) in the ANSWER BOOK.

1.1.1 A freeway is a road meant for low-speed travel over long distances.

1.1.2 Retro-reflective paint is a paint that reflects light when light, like from a car headlight, shines on it.

1.1.3 Skid resistance is the ability of the road to stop cars from sliding on its surface.

1.1.4 Pavement is the asphalt layer on the finished surface of a road on which traffic moves.

1.1.5 Slay is a strong waste material.

1.1.6 A piece of ground where the round is built, is called a site.

1.1.7 A strip of land bordering a round is called a dense.

1.1.8 The part of the round that is meant for vehicles, not for pedestrians is called a prime.

1.1.9 A base coat applied as a seal is called excavation.

1.1.10 An intersection is the place where one road crosses another.

(10 × 1) (10)

1.2 Define each of the following road terms:

1.2.1 Inlet

1.2.2 Mitre drains

1.2.3 Side drain

1.2.4 Sub-soil drain

1.2.5 Cemented drain

(5 × 2) (10)

[20]

QUESTION 2: INTRODUCTION TO ROAD SURFACING

2.1 Briefly list THREE benefits of surfacing the road. (3)

2.2 Name FIVE pieces of equipment that are required for the laying of single and double seals. (5)

2.3 The aggregates' hardness depends on certain properties that are tested in the laboratory. Name FIVE properties of that aggregate. (5)

2.4 Define the term *compaction*. (2)
[15]

QUESTION 3: ROAD FURNITURE

3.1 Briefly list FIVE functions of road signs. (5)

3.2 Name FIVE different types of road signs that are found under regulation signs. (5)
[10]

QUESTION 4: ROAD SURVEY

4.1 Briefly explain where a vertical curve on the road is used and give TWO types of vertical curves. (4)

4.2 What is a sight distance and why is it important on the road? (4)

4.3 Setting out a curve is the process of locating the various points along the length of the curve. List FOUR basic methods of setting out horizontal curve. (4)

4.4 Briefly discuss FIVE steps to position the levelling staff correctly before surveying. (5)

4.5 What are the FIVE general procedures for using a theodolite to measure horizontal angles? (5)

4.6 Give THREE components of theodolite. (3)
[25]

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QUESTION 5 : EARTHWORK

5.1 State TWO different ways of compacting the soil and explain how each is done. (4)

5.2 Give TWO descriptions of each of the following types of rollers:

5.2.1 Static weight roller

5.2.2 Vibratory roller

5.2.3 Smooth drum roller

5.2.4 Impact roller

5.2.5 Pneumatic roller

(5 × 2) (10)

5.3 Copy the table below in your ANSWER BOOK and fill in the answers where the numbers appear:

Soil type	Plant to be used	Reason
Silty sand and clay	5.3.1	5.3.4
Granular materials	5.3.2	5.3.5
Crushed stone	5.3.3	5.3.6

(6)

5.4 As soils react differently to compaction, it is important to know how each one is likely to react before compaction is started. State how each of the following types of soil reacts to pavement subgrade layer. Use Excellent, Good, Moderate, Poor or Very poor.

5.4.1 Clay

5.4.2 Gravel

5.4.3 Silt

5.4.4 Sand

5.4.5 Organic

(5 × 1) (5)

5.5 What are the FOUR most widely used tests to determine if proper soil compaction is achieved for road building? (4)

5.6 Name ONE apparatus needed to perform a modified AASHTO test. (1)

[30]

TOTAL: 100

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