higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

ROADS
NQF LEVEL 3

(12030363)

7 December 2020 (X-paper)
09:00–12:00

This question paper consists of 5 pages.

383Q1N2007

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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: FURTHER ROAD 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 Asphalt is a mixture of aggregates, filler and cement.

1.1.2 Rehabilitation entails maintaining, fixing and improving the condition and riding comfort of a road.

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

1.1.4 Prime coat is a layer of low-viscosity bitumen applied to the base course to provide adhesive between the base and the surface.

1.1.5 Refuse bins are containers fixed on sidewalks in which pedestrians can throw their rubbish.

1.1.6 Kerbs are the concrete structures installed on both sides of the road.

1.1.7 Borrow pit is the place where we borrow material like gravel to use on the road.

1.1.8 A drain that is built parallel to the road, but outside the road prism, to divert any water that will flow into the road prism away from the road, is called a catch water drain.

1.1.9 Side drain is a longitudinal drain built at the base of the fill and at the top of the cut.

1.1.10 Cemented material is a material in a pavement that can be broken with the tines of a road grade ripper.

(10 × 1) (10)

1.2 Define the following terms:

1.2.1 Fill

1.2.2 Subsoil drain

1.2.3 Road shoulder

1.2.4 Roadbed

1.2.5 Camber

(5 × 2) (10)

[20]

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QUESTION 2: INTRODUCTION TO ROAD SURFACING

2.1 Name THREE advantages of surfacing a road. (3)

2.2 List FOUR different types of equipment/tools that can be used during priming of the road surface. (4)

2.3 List FIVE steps that can be followed when prime coat is applied on the road surface. (5)

2.4 Name THREE different types of paving methods used during road construction. (3)

[15]

QUESTION 3: ROAD FURNITURE

3.1 Name THREE categories of road furniture. (3)

3.2 List FIVE types of road signs that are found under regulatory signs. (5)

3.3 Give TWO components of the guardrail. (2)

[10]

QUESTION 4: ROAD SURVEYING

4.1 Name TWO types of curves that are found on the road and give TWO examples of each. (4)

4.2 In which situations are the vertical and horizontal curves used?

Give TWO situations. (2)

4.3 List FOUR basic methods that can be used when setting out horizontal curves. (4)

4.4 List FIVE steps that need to be considered when using a tangent method to set out horizontal curves. (5)

4.5 Name the FIVE steps that must be carried out when estimating horizontal distance using a dumpy level. (5)

4.6 Name THREE main stages of setting up a theodolite. (3)

4.7 Give TWO reasons why most surveyors prefer to use the dumpy level when levelling the ground. (2)

[25]

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QUESTION 5: EARTHWORKS

5.1 Name the types of roller used to compact the following:

5.1.1 Clay soil often used in road construction

5.1.2 To compact granular soil

5.1.3 To manipulate the soil structure

5.1.4 Unstable for uniform sands, silty and soft clay

5.1.5 Used in collapsible soil

5.1.6 Compress/condense the soil to prepare it for a new road surface.

(6 × 1) (6)

5.2 Explain the following types of soil and give an example of each.

5.2.1 Cohesive soil (4)

5.2.2 Non-cohesive soil (4)

5.3 Compaction is the process of compressing the soil by using compaction equipment.

List FOUR different types of handheld equipment used to compact the soil. (4)

5.4 Name FOUR soil tests that are used to test the soil during road construction. (4)

5.5 State TWO different tools/equipment that can be used for each test in QUESTION 5.4. (8)

[30]

TOTAL: 100

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