higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

ROADS

NQF LEVEL 4

(12030534)

12 March 2018 (Y-Paper)

13:00–16:00

This question paper consists of 4 pages.

NCV

TIME: 3 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
2. Read ALL the questions carefully.
3. Number the answers correctly according to the numbering system used in this question paper.
4. Write neatly and legibly.
5. Keep subsections of questions together.
6. Rule off across the page on completion of each question.
7. ALL work you do not want to be marked must be clearly crossed out.

NCV

QUESTION 1: Road Drainage.

1.1 Road culverts are manufactured in different sizes and made from different types of materials.

1.1.1 Explain the function of a road culvert. (2)

1.1.2 Name FOUR different types of materials that are used to manufacture culverts. (4)

1.2 Longitudinal side drains are usually paved concrete structures or ditches that are constructed parallel along the side of the surfacing layer of the road.

List FIVE different types of longitudinal side drains. (5)

1.3 Name FIVE advantages of gabion structures when constructing roads. (5)

1.4 Describe FIVE aspects that are required when planning and designing a sub-surface drainage system for a road. (5)

1.5 Describe the function and structural design requirements for the following types of subsurface drainage.

1.5.1 Trench drains (interceptor drains) (2)

1.5.2 Layer drainage (2)

1.5.3 Structural drainage (2)

1.6 Define the term sand blankets when used for drainage in layer works. (3)

[30]

QUESTION 2: ROAD PAVEMENTS

2.1 It is very important to create a durable road surfacing when constructing a road pavement layer.

List THREE main types of hard surfaced road pavements. (3)

2.2 State FIVE function of the sub base course when constructing a road. (5)

2.3 Explain the difference between fixed-form and slip-form paving methods. (4)

2.4 What is the reason for compacting the concrete when casting a reinforced concrete pavement? (3)

2.5 In South Africa concrete paving blocks are categorized into three different types and shapes.

List each one of the THREE types and describe the pattern and shape for each the different types of paving blocks. (6)

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2.6 Concrete block paving has many advantages compared to other types of road pavements.

Name FIVE advantages of concrete blocking paving. (5)

2.7 Edge restraints are used to retain the bedding sand and to ensure that the paving block units at the edge of the pavement do not creep outwards.

Explain FIVE aspects that need to be considered when selecting the correct type of edge restraints to be used. (5)

2.8 Name TWO main safety hazards to consider when working with molten bitumen. (2)

2.9 List FIVE properties of bitumen when used in asphalt surfacing. (5)

2.10 Bitumen binders are important when manufacturing different types of bitumen.

Name TWO types of bitumen that are commonly used. (2)
[40]

QUESTION 3: ROAD MAINTENANCE AND REHABILITATION

3.1 What is the difference between preventative maintenance and routine maintenance (5)

3.2 Explain the planning and safety requirements that need to be in place for the following activities during traffic control accommodation where road works is in place.

3.2.1 One lane traffic control. (3)

3.2.2 Redirecting, controlling and slowing down traffic. (3)

3.2.3 Enforcing speed limits. (3)

3.3 List THREE important aspects to ensure the safety of the road user inside the road reserve. (3)

3.4 State FIVE on-going road maintenance activities that need to be in place to ensure a comfortable and safe road surface to drive on (5)

3.5 What does the acronym SANRAL stand for? (2)

3.6 Describe the method that needs to be followed to make a complete dowel expansion joint repair in a concrete pavement. (6)
[30]

TOTAL: 100

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