higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

PLANT AND EQUIPMENT
NQF LEVEL 3

(12030263)

7 March 2018 (X-Paper)
09:00–12:00

This question paper consists of 7 pages.

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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. ALL drawings must be neat and well balanced.
5. Write neatly and legibly.

NCV

QUESTION 1: BASIC FIRE AWARENESS

Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'true' or 'false' next to the question number (1.1–1.5) in the ANSWER BOOK.

1.1 Class B fires are also called combustible fires.

1.2 One of the three main things that can be done to reduce the risk of fire is to keep potential fuel for fires, such as paper, wood and petrol away from sources of ignition.

1.3 One of the ways to extinguish a Class C fire is to spray water on the fire.

1.4 Never use water to extinguish a Class B fire because it will make the burning liquid spray in all directions.

1.5 One of the prerequisite elements for starting fire is a heat.

(5 × 1) **[5]**

QUESTION 2: LIFTING OF HEAVY OBJECTS

2.1 Complete the following paragraphs on lifting devices by choosing the correct term from those given in brackets. Write only the term next to the question number (2.1.1–2.1.10) in the ANSWER BOOK.

Lifting machines must be thoroughly inspected at least every (2.1.1 … 12/24) months by a/an (2.1.2 … qualified/experienced) lifting machinery inspector. Ropes, chains, hooks and other attaching devices must also be thoroughly inspected every (2.1.3 … 6/12) months by a/an (2.1.4 … qualified/experienced) lifting equipment inspector.

Each lifting device must have a register in which (2.1.5 … inspections/names) and (2.1.6 … tests/surnames) are recorded. The register must also include any (2.1.7 … repairs/drivers' names) as well as (2.1.8 … modifications/ inspectors) to the lifting device.

When people, for example construction workers, have to be hoisted to work at heights, or lowered back to the ground again, (2.1.9 … lifts/stairs) and (2.1.10 … escalators/safety harnesses) specifically designed for such, must be used and not unauthorised machinery. (10 × 1) (10)

2.2 A lever is a tool used to move heavy objects or loads with less effort or faster.

Name FIVE parts of a simple lever. (5)

2.3 Give FIVE examples of lifting plants. (5)

[20]

QUESTION 3: ELECTRIC MOTORS AND INTERNAL COMBUSTION ENGINES

3.1 Only about 30% of the energy produced by burning fuel in a car engine is transformed into the type of energy that moves the car.

Give a summary of what happens to the rest of the energy. (2)

3.2 Give FOUR advantages of using electrical motors and discuss each. (4 × 3) (12)

3.3 Give a summary on why it is best to fill a fuel tank before nightfall. (4)

3.4 Define the term *lubrication*. (2)
[20]

QUESTION 4: TRANSMISSIONS

4.1 Discuss chain drives under any FOUR of the following headings:

4.1.1 Cost

4.1.2 Efficiency

4.1.3 Work

4.1.4 Maintenance

4.1.5 Material

(4 × 1) (4)

4.2 Name TWO types of transmissions and briefly discuss each. (2 × 3) (6)
[10]

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QUESTION 5: MAINTENANCE OF VEHICLES

5.1 Maintenance checks have to be performed on construction vehicles to ensure that such vehicles operate properly and safely.

How often should the following checks be performed on construction vehicles:

5.1.1 Fuel levels

5.1.2 Coolant levels

5.1.3 Oil levels

5.1.4 Battery water levels

5.1.5 Brake fluid levels

5.1.6 Tyre pressure

5.1.7 Change of oil, oil filters, petrol filters, air filters and spark plugs

(7 × 1) (7)

5.2 Given below are the steps (NOT in correct sequence) to follow when checking the oil levels in a construction vehicle.

Rewrite the steps in the correct sequence by writing the step next to the question number (5.2.1–5.2.7) in the ANSWER BOOK.

5.2.1 If the oil level is correct, replace the dipstick.

5.2.2 Remove the dipstick again and check the oil level which should preferably be at the maximum level.

5.2.3 Replace the dipstick, making sure that you push it all the way in.

5.2.4 Remove the dipstick and wipe it off clean with a cloth.

5.2.5 Locate the dipstick from the engine of the vehicle.

5.2.6 Park the vehicle on a level surface.

5.2.7 Make sure that the vehicle is at its normal operating temperature.

(7 × 1) (7)

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5.3 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'true' or 'false' next to the question number (5.3.1–5.3.6) in the ANSWER BOOK.

5.3.1 If you need to jack up a vehicle, first make sure that the handbrake is not on and that the vehicle is not in gear.

5.3.2 A pressure gauge is an instrument used to test batteries.

5.3.3 Vehicle batteries have three terminals, namely a negative terminal, a positive terminal and a neutral terminal.

5.3.4 The abbreviation (GVM) as used on vehicle loading refers to gross vehicle mass.

5.3.5 All construction vehicles should have an instrument panel which is functioning well and the driver of the vehicle can easily see.

5.3.6 It is a good idea and very important to inflate your tyres to the pressure recommended for your vehicle.

(6 × 1) (6)
[20]

QUESTION 6: SMALL PLANT AND POWER TOOL OPERATION

6.1 Give ONE term for each of the following descriptions. Write only the term next to the question number (6.1.1–6.1.3) in the ANSWER BOOK.

6.1.1 A device used to move liquids from one place to another by mechanical means

6.1.2 Air of which the volume has been decreased by the application of pressure

6.1.3 A tool used when changing the bits on a drilling machine

(3 × 1) (3)

6.2 List FIVE parts of an angle grinder. (5)

6.3 Name FIVE pieces of personal protective equipment to wear while using an angle grinder to cut through masonry at the construction site. (5)

6.4 Name TWO tools operated by compressed air around the site. (2)
[15]

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QUESTION 7: OXY-ACETYLENE

7.1 Name THREE types of flames that can be produced by an oxy-acetylene torch. (3)

7.2 List FIVE components of an oxy-acetylene set. (5)

7.3 Explain the importance of storing gas cylinders in a dry, well-ventilated area. (2)

[10]

TOTAL: 100

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