higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

PLANT AND EQUIPMENT
NQF LEVEL 3

(12030263)

19 November 2018 (X-Paper)
09:00–12:00

This question paper consists of 6 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 according to the numbering system used in this question paper.
4. Ensure that ALL drawings are neat and well balanced.
5. Write neatly and legibly.

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QUESTION 1: BASIC FIRE AWARENESS

1.1 Rewrite the following procedure on how to use a fire extinguisher in the correct sequence:

- Squeeze the lever slowly.
- Pull the pin at the top of the fire extinguisher.
- Sweep the fire extinguisher from side to side.
- Aim at the base of the fire, not at the flames. (4 × 1) (4)

1.2 Define the term *fire blanketing*. (1)
[5]

QUESTION 2: LIFTING EQUIPMENT

2.1 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'true' or 'false' next to the question number (2.1.1–2.1.7) in the ANSWER BOOK.

2.1.1 A hoist is a portable device that uses a mechanical or hydraulic lifting system to raise heavy objects.

2.1.2 Inspection and testing of lifting equipment should be done at least every 18 months.

2.1.3 A new inspection register should be completed each time that an inspection is performed, and the previous register must be destroyed immediately.

2.1.4 Hoisting and lowering of people can be done only if the machine is operated by any supervisor on the site.

2.1.5 The abbreviation *SWL* refers to 'specific weight lifted'.

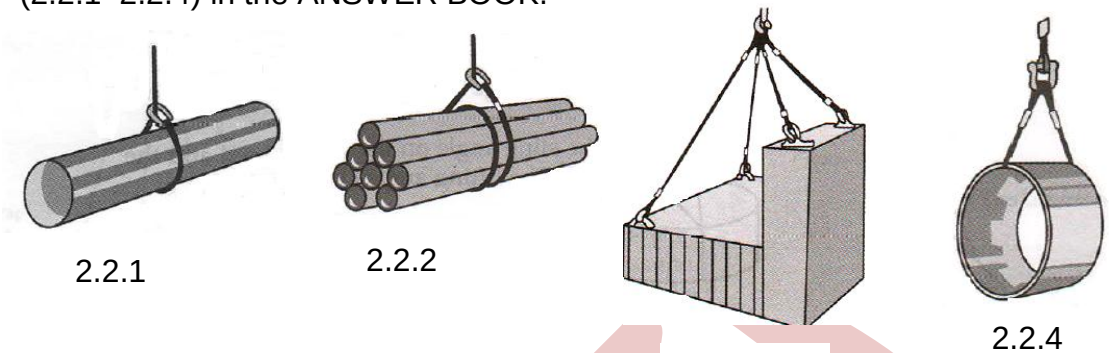
2.1.6 Any supervisor on the site can inspect the lifting equipment.

2.1.7 It is the responsibility of every operator to check machinery again before using it, even if the inspector has inspected it.

(7 × 1) (7)

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2.2 The pictures below shows different hitching methods used in construction. Write down the correct names of these methods next to the numbers (2.2.1–2.2.4) in the ANSWER BOOK.



2.2.1 2.2.2 2.2.3 2.2.4 (4)

2.3 What do we use a gear for in the plant and equipment field? (1)

2.4 State ONE advantage of a conveyor belt. (1)

2.5 In point form, list and explain SEVEN steps on how to use a rope pulley safely. (7)

[20]

QUESTION 3: ELECTRIC MOTORS AND INTERNAL COMBUSTION ENGINES

3.1 Define the term *power*. (2)

3.2 Explain the term *electric motor*. (2)

3.3 Give ONE word for the following phrases:

3.3.1 A force that tends to rotate or turn things

3.3.2 Applying oil or grease between two moving parts. (2 × 1) (2)

3.4 Give FOUR reasons why electric motors require less maintenance than internal combustion engines. (4)

3.5 Name FOUR major parts of an internal combustion engine and explain each one of them. (4 × 2) (8)

3.6 The colour of smoke can be a useful guide for diagnosing the condition of a diesel engine. Explain what is indicated by the following smoke colours:

3.6.1 White smoke

3.6.2 Blue smoke (2 × 1) (2)

[20]

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QUESTION 4: TRANSMISSIONS

4.1 Complete the following statements on parts of a transmission by choosing the correct word(s) in brackets. Write only the word(s) next to the question numbers (4.1.1–4.1.4) in the ANSWER BOOK.

4.1.1 A manual transmission system is connected to the engine by a gearbox and a (synchromesh/clutch).

4.1.2 When a gear is selected using the (shifting rods/gear lever), the associated collar shifts to the left or the right.

4.1.3 The gear set that controls the speed of a car is marked 1 to 5 or 6 and an R that indicates (release/reverse)**.**

4.1.4 A manual-transmission system vehicle has three pedestals, the clutch, brake and (drive shaft/accelerator)**.**

(4 × 1) (4)

4.2 Describe the features of belt drives under the following headings:

4.2.1 Material

4.2.2 Work

4.2.3 Efficiency

4.2.4 Cost

4.2.5 Maintenance (5 × 1) (5)

4.3 Write the abbreviation *r/min* in full, as it is used in transmission systems. (1)

[10]

QUESTION 5: MAINTENANCE OF VEHICLES

5.1 Name TWO types of services that can be performed on vehicles. (2)

5.2 Explain THREE advantages of daily maintenance on a construction vehicle. (3)

5.3 Explain briefly how you would extend the life of a battery in a vehicle. (4)

5.4 State TWO advantages of wheel alignment on a vehicle. (2)

5.5 Give FOUR things that you should NOT do with old engine oil. (4)

5.6 List FIVE warning lights that can appear on the display panel to indicate to the operator of a vehicle that a fault has occurred.. (5)

[20]

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QUESTION 6: SMALL PLANT AND POWER–TOOL OPERATION

6.1 Indicate TWO types of impellers. (2)

6.2 Give THREE main reasons why small portable generators on a construction site would use two-stroke petrol engines. (3)

6.3 Write down FOUR safety tips to follow when using extension cords. (4)

6.4 Describe TWO results of an overloaded concrete mixer on a construction site. (2)

6.5 Different drill bits are used to perform various drilling tasks.

Indicate FOUR situations in which different drill bits will be used. (4)
[15]

QUESTION 7: OXY-ACETYLENE

7.1 Name TWO types of gas cylinders. (2)

7.2 Explain the meaning of lashing of gas bottles. (2)

7.3 Explain THREE hazards of working with oxy-acetylene in a confined space. (3)

7.4 Name THREE types of personal protective equipment (PPE) that must be worn while welding. (3)
[10]

TOTAL: 100

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