higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

PLANT AND EQUIPMENT
NQF LEVEL 3

(12030263)

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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)
PLANT AND EQUIPMENT
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: BASIC FIRE AWARENESS

Indicate whether the following statements are TRUE or FALSE by writing 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 fires 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 it with water.

1.4 Water should never be used to extinguish a Class B fire, because it will cause the burning liquid to spray in all directions.

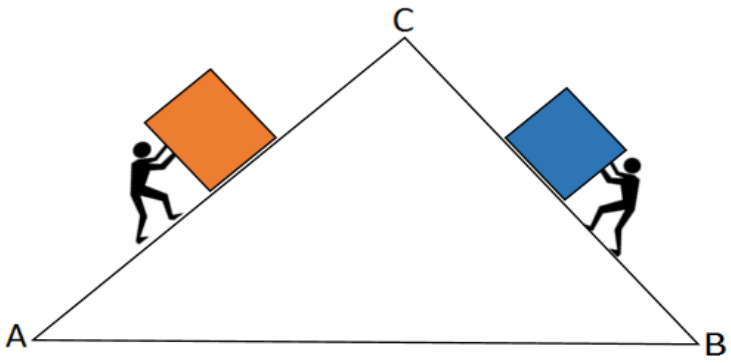
1.5 One of the prerequisite elements for starting a fire is heat.

(5 × 1) **[5]**

QUESTION 2: LIFTING OF HEAVY OBJECTS

2.1 The figure below shows a man who needs to push a box up a hill. He can either start at point A and push it up the steep slope or he can start at point B and push it up the gentle slope.

Compare the pictured scenarios and explain from which point he would do less work or more work.



(10)

2.2 A lever is a tool that is used to move heavy objects or loads fast and with minor effort.

Name FIVE parts of a simple lever. (5 × 1) (5)

2.3 Name FIVE lifting plants. (5 × 1) (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 a type of energy that moves the car.

Give a summary of what happens to the rest of the energy. (3)

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

3.3 In point form, give a summary of why it is best to fill a fuel tank before nightfall. (5)

[20]

QUESTION 4: TRANSMISSIONS

4.1 State FOUR reasons why transmissions are needed. (4 × 1) (4)

4.2 Show the formulae for calculating gear ratio. (2)

4.3 Give a short summary of how to change from second gear to third gear with a simple manual transmission. (2 × 2) (4)

[10]

QUESTION 5: MAINTENANCE OF VEHICLES

5.1 List the FOUR documents to consult before doing maintenance on a vehicle. (4 × 1) (4)

5.2 List and describe the THREE different levels or types of maintenance. (3 × 2) (6)

5.3 Indicate whether the following statements are TRUE or FALSE by writing only 'True' or 'False' next to the question number (5.3.1–5.3.4) in the ANSWER BOOK.

5.3.1 Groove depth is the angle taken from the top of the tyre to the bottom of the groove indent.

5.3.2 When the tyre pressure is too low, we say the tyre is underinflated and when the tyre pressure of a vehicle is too high, we say that the tyre is overinflated.

5.3.3 An oil filter is a device through which the oil moves after it has been through the engine.

5.3.4 A battery may only be vented by opening the cells before charging it.

(4 × 1) (4)

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5.4 Before batteries can be cleaned with a bicarbonate solution, the correct safety measures must be followed.

Explain what needs to be done before cleaning a battery. (3)

5.5 Differentiate between a *single fitment* and *twin fitments*. (3)

[20]

QUESTION 6: SMALL PLANT AND POWER TOOL OPERATION

6.1 Differentiate between *self-priming water pumps* and *non-self-priming water pumps.* (6)

6.2 Describe the main purpose of a dynamo. (2)

6.3 Write a paragraph on why erratic electricity is a problem. (4)

6.4 Name THREE disadvantages of working with compressed air. (3 × 1) (3)

[15]

QUESTION 7: OXY-ACETYLENE

7.1 With regard to pressure, how does an oxygen regulator differ from an acetylene regulator? (2)

7.2 Define the term *spatter.* (2)

7.3 Name THREE items of PPE that must be used when working with oxy-acetylene equipment and give a reason for wearing each one. (3 × 2) (6)

[10]

TOTAL: 100

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