higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

AUTOMOTIVE REPAIR AND MAINTENANCE
NQF LEVEL 2

(6021032)

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

This question paper consists of 7 pages.

NCV

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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. Start each question on a NEW page.
5. Write neatly and legibly.

NC(V)

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QUESTION 1

1.1 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'True' or 'False' next to the question number (1.1.1–1.1.10) in the ANSWER BOOK.

1.1.1 The viscosity of the oil indicates the ability of the oil to flow.

1.1.2 Tubeless tyres are not safer than tyres with tubes inside.

1.1.3 To help prevent accidents in the workplace safety signs should be visible.

1.1.4 Radial and axial loads can be applied on a ball bearing.

1.1.5 A post-operational check is checking a vehicle before the service.

1.1.6 A diode, used on circuit boards, allows current to flow in both directions.

1.1.7 A 12 Volt motorcar battery has five cell dividers.

1.1.8 The tool-rest of the bench-grinder must be correctly adjusted.

1.1.9 The platform forms part of a two-post hoist.

1.1.10 A viscous type fan is operated by an electrical circuit and a motor.

(10 × 1) (10)

1.2 Choose an item/description from COLUMN B that matches a description/item in COLUMN A. Write only the letter (A–F) next to the question number (1.2.1–1.2.5) in the ANSWER BOOK.

COLUMN A		COLUMN B	
1.2.1	Safety signs	A	O.H.S act
1.2.2	Employee slips on wet floor and gets injured	B	unsafe condition
1.2.3	Clean the work bench	C	accident
1.2.4	Work area has too little ventilation	D	restore the work area
1.2.5	The health and safety of employees are protected by it	E	draws your attention to health and safety hazards
		F	incident

(5 × 1) (5)

1.3 Give ONE word/term for each of the following descriptions by choosing a term from the list below. Write only the word/term next to the question number (1.3.1–1.3.5) in the ANSWER BOOK.

rubber gloves; alloy; specific gravity; dilution; electrolyte; reflector

1.3.1 The density of a liquid relative to water

1.3.2 PPE you should use when working on batteries

1.3.3 It forms part of the headlight

1.3.4 The thinning of the oil by fluid such as petrol

1.3.5 A mixture of two or more metals

(5 × 1) (5)
[20]

QUESTION 2

2.1 Use the picture in FIGURE 1 below to answer the questions.

2.1.1 Identify the tool that is being used with the hammer. (1)

2.1.2 Explain the purpose and operation of the tool mentioned in QUESTION 2.1.1. (3)

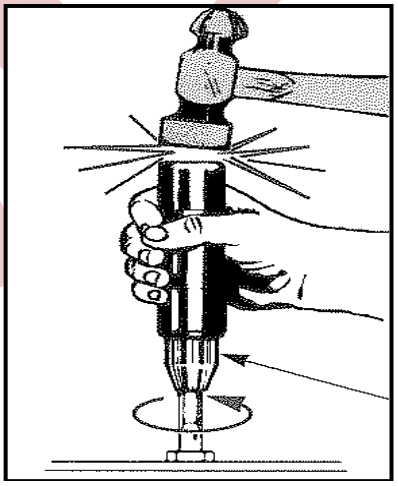


FIGURE 1

2.2 Name the measuring equipment that is used to carry out the following tasks.

2.2.1 To check the pressure that is produced inside the engine cylinder

2.2.2 To set the gap on a spark plug

2.2.3 To check the size of the thread on a bolt

(3 × 1) (3)

2.3 Briefly explain how to avoid parallax error when using measuring instruments. (2)

2.4 Describe the shape of the following safety signs.

2.4.1 Warning sign

2.4.2 Information sign

(2 × 1) (2)

2.5 Describe TWO advantages of portable lifting equipment when compared to hoists. (2)

2.6 Name TWO operational systems that are used on vehicle hoists. (2)

2.7 Name TWO types of fires that could occur in a motor workshop. (2)

[17]

QUESTION 3

3.1 A rotary engine has no reciprocating motion, therefore the strokes are called *phases*.

List the FOUR phases of the rotary engine in the correct order as it happens in each of the chambers. (4)

3.2 Briefly explain the function of each of the following parts/components of a motor vehicle.

3.2.1 The alternator

3.2.2 The flywheel

3.2.3 The crankshaft

(3 × 1) (3)

3.3 Explain the processes that occur inside a two-stroke engine when the piston is on a downward stroke. (3)

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3.4 List the FIVE steps you should follow to safely remove a battery from a motor vehicle. (5)

3.5 Name TWO parts of a 12 Volt motorcar battery. (2)

3.6 Describe THREE pre-checks that should be done on the vehicle before you can start to adjust the headlights. (3 × 2) (3)

[20]

QUESTION 4

4.1 Determine what type of load is being placed on the wheel bearings of a vehicle under the following conditions.

4.1.1 When placing extra weight in the vehicle.

4.1.2 When going fast around a bend.

(2 × 1) (2)

4.2 Give ONE example of each of the following types of bearings.

4.2.1 A friction bearing

4.2.2 An anti-friction bearing

(2 × 1) (2)

4.3 List THREE causes of excessive tyre wear on a vehicle. (3)

4.4 Use the picture in FIGURE 2 below to answer the questions.

4.4.1 Name the TWO indications that show this is a radial-ply tyre. (2)

4.4.2 What is the rim diameter of this tyre?



(1)

FIGURE 3

4.5 Name TWO materials that are used to manufacture wheel rims. (2)

[12]

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QUESTION 5

5.1 List THREE causes of a low oil pressure reading if the engine oil is within the specified level. (3)

5.2 Explain the purpose of radiator shutters when it forms part of the cooling system of a vehicle. (3)

5.3 Name the type of cooling fan that runs with the engine speed and is activated by the heat coming through the radiator. (1)

5.4 While you are driving a vehicle, a light on the instrument panel will indicate if the oil pressure is low.

Name the part on the engine that will activate this light. (1)

5.5 Explain the operation of the oil pressure relief valve in the lubrication system of a vehicle. (3)

5.6 What is the meaning of the acronym 'SAE' used in lubricating engine oils? (1)

[12]

QUESTION 6

6.1 List THREE inspections that can be done on the rims and tyres of a vehicle while it is being serviced. (3)

6.2 List THREE types of oils that you might require to replace or top up when servicing a vehicle. (3)

6.3 State THREE reasons why tools should be cleaned and stored after being used. (3)

6.4 Explain why it is important to warm up the oil of the transmission before draining it. (3)

6.5 A post-operational check is an important part of the quality control.

Name THREE tasks that should be done as part of this check. (3)

6.6 Incorrect disposing of oil can negatively affect the environment.

Explain how you should correctly dispose of it. (2)

6.7 Name TWO tools that you would need to drain the engine oil and change the oil filter on a vehicle. (2)

[19]

TOTAL: 100

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