higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

AUTOMOTIVE REPAIR AND MAINTENANCE NQF LEVEL 3

(6021033)

9 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 sketches must be neat and in proportion.
5. Start each question on a NEW page.
6. Write neatly and legibly.

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QUESTION 1

1.1 Name THREE different types of suspension springs used on motor vehicles. (3)

1.2 Which task can be performed regularly to prevent knocking noises from the suspension? (1)

1.3 Identify THREE of the protective equipment in FIGURE 1 that you would require when working on the suspension.



FIGURE 1 (3)

1.4 Indicate whether the following statements are TRUE or FALSE. Write only 'true' or 'false' next to the question number in the ANSWER SHEET.

1.4.1 When the wheel tracking is correct, the rear wheels will follow the track of the front wheels.

1.4.2 Over steer is when the driver has to turn the steering more to correct it.

1.4.3 Side wear on tyres is caused by incorrect caster settings.

1.4.4 Toe out is when the distance between the front end of the wheels is greater than of the rear end.

1.4.5 A two-post hoist is used to do wheel alignment on a vehicle.

1.4.6 The wheel balancer uses an automatic guard.

1.4.7 Tyre pressure has an effect on the balancing.

1.4.8 A lower control arm is part of the un-sprung mass.

(8 × 1) (8)

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1.5 Name TWO inspections to perform on a rim before the wheel can be balanced. (2)

1.6 Name FOUR items, besides the wheel balancing machine, that one would need to complete the balancing of the wheel. (4)

1.7 Give TWO important steps to follow when one mounts the wheel on the wheel balancing machine before one can start balancing the wheel. (2)
[23]

QUESTION 2

2.1 Briefly explain the purpose of the following additives found in fuels:

2.1.1 Oxidation inhibitors

2.1.2 Dye

2.1.3 Anti-icing agents

(3 × 1) (3)

2.2 Identify FOUR tests that can be done on an injector. (4)

2.3 List THREE methods used to heat up the thermostatic spring of the choke. (3)

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2.4 Choose a description from COLUMN B that matches an item in COLUMN A. Write only the letter (A–I) next to the question number (2.4.1–2.4.8) in the ANSWER BOOK.

COLUMN A		COLUMN B	
2.4.1	Capacitor (condenser)	A	routes the spark from the coil to each spark plug cable
2.4.2	Primary coil windings	B	switches the coil ON and OFF
2.4.3	Ballast resistor	C	produces a strong magnetic field when current flows through it
2.4.4	Ignition points	D	carries the spark from distributor to spark plug
2.4.5	Rotor arm	E	it makes contact on the rotor arm
2.4.6	Spark plug	F	generates a high voltage (spark)
2.4.7	Secondary coil windings	G	reduces arcing at the points
2.4.8	HT leads	H	reduces current flow through the circuit to protect the parts
		I	supplies the spark to ignite the mixture

(8 × 1) (8)
[18]

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QUESTION 3

3.1 Explain SIX steps one should follow when refitting an alternator to an engine. (6)

3.2 State TWO reasons why the charging rate of an alternator would be above specifications. (2)

3.3 Use FIGURE 2 below to answer the questions.

3.3.1 Differentiate between section A and section B of the solenoid by explaining the function of each. (2 × 2) (4)

3.3.2 Name the parts of the starter motor labelled C to F.

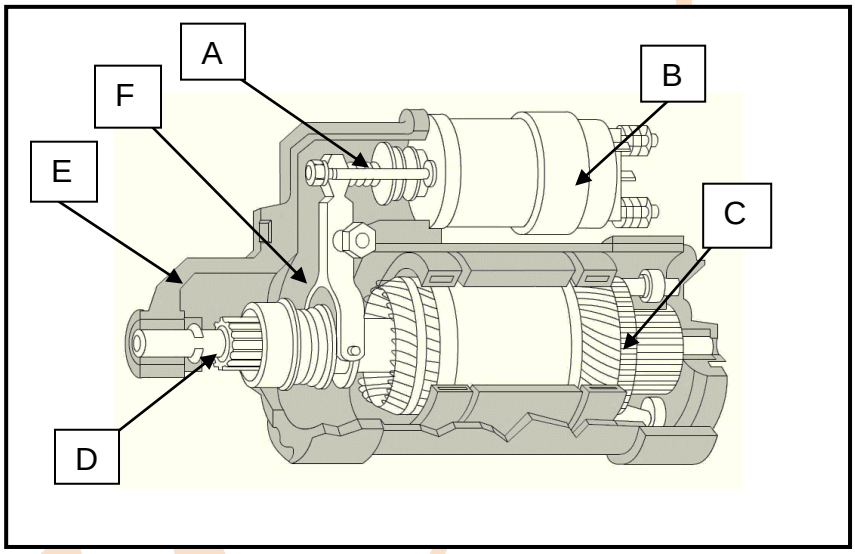

FIGURE 2

(4 × 1) (4)
[16]

QUESTION 4

4.1 Explain the importance of acquiring the manufacturer's specifications when doing a compression test. (3)

4.2 State TWO important pieces of vehicle information one needs to determine the correct specifications for the compression pressure. (2)

4.3 Describe THREE methods that can be used to clean engines and components. (3)

4.4 List FOUR items one needs to disconnect or remove when preparing to remove an engine from a vehicle. (4)

4.5 Which important steps should be adhered to before when removing or disconnecting the items in QUESTION 4.4? (2)

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4.6 Name ONE check that should be done on the lifting equipment before it is used to remove the engine. (1)

4.7 Name any FOUR possible component repairs that would be required when an engine has overheated, causing one piston and cylinder to develop deep seizure marks. (4)

4.8 Identify FOUR parts displayed in FIGURE 3 below.



FIGURE 3 (4)

4.9 Name the TWO measurements that can be done on a cylinder head to determine its serviceability or amount of wear. (2)
[25]

QUESTION 5

5.1 Give TWO advantages of helical gears as used in transmissions. (2)

5.2 Explain the purpose of the interlocking mechanism of the gearbox. (2)

5.3 List any FOUR pre-checks one should do before dismantling the differential. (4)

5.4 Make a simple sketch of a dual piston wheel cylinder and label all the parts. (6)

5.5 Determine FOUR possible causes for the brakes of a vehicle to bind or drag. (4)
[18]

TOTAL: 100

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