higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

MOTOR TRADE THEORY N1

(11040651)

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This question paper consists of 6 pages.

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
MOTOR TRADE THEORY N1
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. Draw ALL sketches neatly and in good proportion.
5. Write neatly and legibly.

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QUESTION 1

1.1 Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question number (1.1.1–1.1.10) in the ANSWER BOOK.

1.1.1 Instrument used to measure crankshaft end float:

A Dial gauge
B Feeler gauge
C Vernier calliper
D Depth gauge

1.1.2 Which component opens and closes the inlet port on a four-stroke engine?

A Valve
B Camshaft
C Valve lifter
D Inlet valve

1.1.3 The main constituent in clutch-plate manufacturing:

A Fibreglass
B Copper
C Asbestos
D Brass

1.1.4 The rotary engine is also known as the … engine.

A Wankel
B Otto
C diesel
D petrol

1.1.5 Oil pump with the most pulsation:

A Rotor
B Vane
C Gear
D Piston

1.1.6 Which oil additive reduces sludge formation in the crankcase?

A Corrosion inhibitors
B Oxidation inhibitors
C Detergent or dispersant
D Foaming inhibitors

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1.1.7 The lubricant system most commonly used in small engines:

A Force-feed
B Splash
C Dry-sump
D Full force-feed

1.1.8 The component in a cooling system that controls engine temperature:

A Radiator fan
B Radiator
C Thermostat
D Water pump

1.1.9 Engine layout in F1 racing cars:

A Front-engine rear-wheel drive
B Mid-engine rear-wheel drive
C Rear-engine rear-wheel drive
D Front-engine front-wheel drive

1.1.10 The wheel-rim design exclusively used for passenger cars and light commercial vehicles:

A Drop centre
B Two-piece flat base
C Three-piece flat base
D Four-piece flat base

(10 × 1) (10)

1.2 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'True' or 'False' next to the question number (1.2.1–1.2.10) in the ANSWER BOOK.

1.2.1 Unsafe acts and conditions cause accidents.

1.2.2 It is acceptable to work underneath a car without axle stands if you are in a hurry.

1.2.3 A pin punch is used to make a guide hole for drilling holes.

1.2.4 A reamer is a cutting tool used to accurately size drilled holes.

1.2.5 A gudgeon pin holds the piston and connecting rod together.

1.2.6 Hydraulic cam followers allow the valve train to run at 0 mm valve clearance.

1.2.7 A micrometer is used to measure external and internal diameters.

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1.2.8 Because the two-stroke engine delivers power on every downward stroke, it is more powerful and efficient than the four-stroke engine.

1.2.9 Oil dilution occurs when the sump is over-filled with oil.

1.2.10 Oil or grease on the clutch lining can cause the clutch to slip.

(10 × 1) (10)
[20]

QUESTION 2

2.1 Draw a neat, labelled sketch of a vernier calliper. Include at least FIVE labels. (5 + 5) (10)

2.2 Name the FIVE categories of safety signs. (5)
[15]

QUESTION 3

3.1 List the 10 main components that make up a conventional short-block sub-assembly. (10)

3.2 Name the material that pistons are made of and explain why this material is preferred. (1 + 2) (3)

3.3 Name THREE camshaft drive systems used on engines. (3)

3.4 Give THREE advantages of belt drive systems. (3)

3.5 Which conventional cam drive system directly drives the camshaft in the opposite direction of crankshaft rotation? (1)
[20]

QUESTION 4

4.1 Explain how radiator shutters control engine temperature. (7)

4.2 Give THREE advantages of an air-cooled system over a water-cooled system. (3)

4.3 How are the cylinders in air-cooled engines adapted to improve heat dissipation? (2)

4.4 What is the boiling point of pure water at sea level? (1)

4.5 Give TWO methods to increase the boiling point of engine coolant. (2)
[15]

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QUESTION 5

5.1 Explain the process of testing engine-oil pressure. (5)

5.2 Give FIVE reasons why the oil light will flicker when the engine is at idle. (5)

5.3 Make a neat, labelled sketch of a plunger-type oil-pressure control valve. (5)
[15]

QUESTION 6

6.1 What advice will you give to a customer if the tyres of his/her car are wearing on the outer edges? (1)

6.2 Name THREE constituents used in tyre production. (3)

6.3 Give FOUR advantages of tubeless tyres. (4)

6.4 Give THREE reasons why a battery may be flat in the morning. (3)

6.5 Which TWO types of springs are used in pressure-plate assemblies? (2)

6.6 Name TWO clutch-actuating mechanisms used on passenger and light delivery vehicles. (2)
[15]

TOTAL: 100

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