



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T1220(E)(A5)T

NATIONAL CERTIFICATE

MOTOR TRADE THEORY N1

(11040651)

5 April 2018 (X-Paper)
09:00–12:00

This question paper consists of 8 pages.

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. All sketches must be neat and in good proportion.
5. Use correct terminology applicable to the subject.
6. Write neatly and legibly.

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 The safety sign that indicates that safety goggles are worn:

A



B



C



D



1.1.2 Files must be regularly cleaned using a ...

- A file brush.
- B brass or copper bar.
- C A and B
- D A or B

1.1.3 When doing a battery electrolyte hydrometer test, the ideal temperature is ...

- A 12 °C.
- B 1,28 °C.
- C 26 °C.
- D 20 °C.

- 1.1.4 The legal limit of tyre tread wear depth is ...
- A 1,6 mm.
 - B 8 mm.
 - C 1,0 mm.
 - D 1,8 mm.
- 1.1.5 Engine pistons are usually made from ...
- A cast iron.
 - B lightweight material.
 - C white metal.
 - D aluminium.
- 1.1.6 are used to control crankshaft end float and side thrust.
- A Main bearings
 - B Conrod bearings
 - C Thrust washers
 - D White metal bearings
- 1.1.7 The main disadvantage of this oil pump is pulsation:
- A Rotor pump
 - B Plunger pump
 - C Gear pump
 - D Vane pump
- 1.1.8 The viscosity of engine oil refers to the ...
- A resistance of the oil to flow.
 - B operating temperature of the oil.
 - C overall quality of the oil.
 - D branding of the oil.
- 1.1.9 The average opening temperature range of the cooling system thermostat is ...
- A 85 °C.
 - B between 82 °C and 90 °C.
 - C 87 °C.
 - D 90 °C.
- 1.1.10 The main reason why asbestos is not used to manufacture clutch linings is because it ...
- A poses a fire risk when it gets hot.
 - B wears too quickly
 - C poses a serious respiratory hazard.
 - D is very expensive.

(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 (1.2.1–1.2.5) in the ANSWER BOOK.

- 1.2.1 A pin punch is identified by its sharp point.
- 1.2.2 The latest safety innovation in tyre manufacturing is run-flat tyres.
- 1.2.3 Only clean air is drawn into the cylinders of diesel engines during the intake stroke.
- 1.2.4 Grease is not regarded as a lubricant because it cannot flow.
- 1.2.5 Another name for a radiator fan clutch is a viscous coupling.

(5 × 1)

(5)
[15]

QUESTION 2

2.1 Briefly explain the condition under which the use of each of the following personal protective equipment (PPE) is required and give ONE example of each:

- 2.1.1 Head protection
- 2.1.2 Eye protection
- 2.1.3 Ear protection
- 2.1.4 Respiratory protection
- 2.1.5 Hand protection

(5 × 2)

(10)

2.2 Before new piston rings are installed into used cylinder bores, the bores must be deglazed.

Name TWO types of honing tools which may be used for this task.

(2)

2.3 Make a sketch of the vernier scale of a vernier bevel protractor showing a reading of 15° 45'.

(3)
[15]

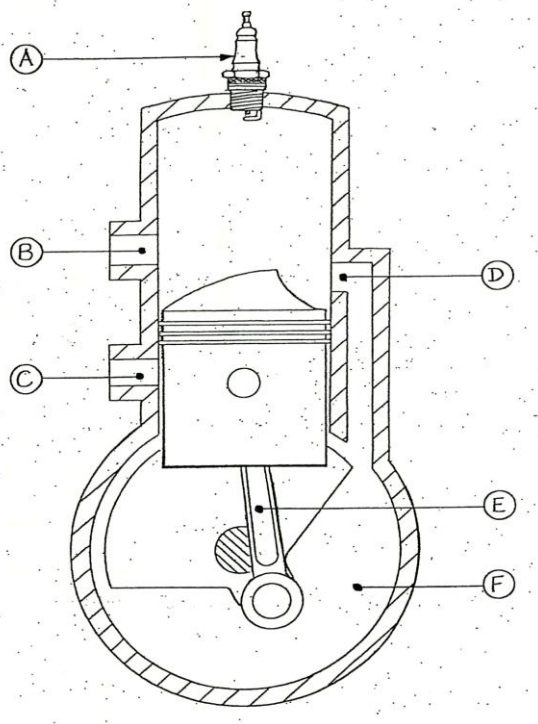
QUESTION 3

- 3.1 Name FOUR common causes of battery failure. (4 × 1) (4)
- 3.2 Which terminal has the larger diameter on a standard car battery? (1)
- 3.3 Indicate, with the aid of a simple sketch, how you would rotate tyres on a car fitted with *directional* tyres. (2)
- 3.4 State the meaning of the following tyre markings with regard to tyre types:
- 3.4.1 P
 - 3.4.2 T
 - 3.4.3 LT
 - 3.4.4 C
- (4 × 1) (4)
- 3.5 Correct tyre inflation is critical for the proper functioning of the tyre.
- By looking at the tyre wear patterns, how will you determine when a tyre is overinflated or when it is underinflated? (2)
- 3.6 Which engine layout is popular in the construction of high-end sports cars? (1)
- 3.7 Give ONE reason for each of the following tyre-wear patterns:
- 3.7.1 Uneven wear
 - 3.7.2 Feather-edge wear
 - 3.7.3 Flat spots
- (3 × 1) (3)
- [17]**

QUESTION 4

4.1 FIGURE 1 shows a two-stroke petrol engine.

Name the parts indicated on the drawing by writing only the answer next to the letter (A–F) in the ANSWER BOOK.

**FIGURE 1**

(6 × 1)

(6)

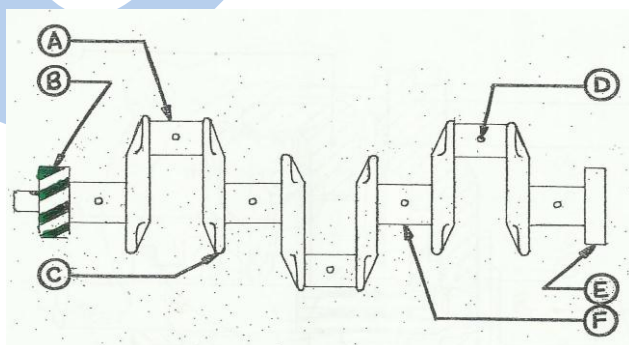
4.2 Fully explain the operating cycle of the two-stroke petrol engine.

(10 × 1)

(10)

4.3 FIGURE 2 shows a crankshaft.

Name the crankshaft parts indicated on the drawing by writing only the answer next to the letter (A–F) in the ANSWER BOOK.

**FIGURE 2**

(6 × 1)

(6)

[22]

QUESTION 5

- 5.1 Draw a neat, labelled sketch of a plunger-type oil pump. Clearly indicate the inlet and outlet ports on the sketch. (8)
- 5.2 Explain the operation of the pump drawn in QUESTION 5.1. (7 × 1) (7)
- 5.3 Name the TWO most common lubrication systems used on motor car engines. (2)
- 5.4 Name TWO other methods of oil control on rotating shafts, apart from the dynamic oil seal. (2)
- [19]**

QUESTION 6

- 6.1 Name TWO common types of thermostats used in car cooling systems and name the active material used in each of these thermostats. (2 × 2) (4)
- 6.2 Why should a radiator cap not be opened while the car is hot or the engine is running? (2 × 1) (2)
- 6.3 Which test is done to detect external leaks in a cooling system? (1)
- 6.4 Name FIVE common cooling system-related causes of overheating. (5 × 1) (5)
- [12]**

TOTAL: 100