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higher education & training

Department:
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REPUBLIC OF SOUTH AFRICA

T1240(E)(N11)T
NOVEMBER EXAMINATION

NATIONAL CERTIFICATE

MOTOR TRADE THEORY N1

(11040651)

11 November 2013 (X-Paper)
09:00–12:00

This question paper consists of 11 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. Label ALL sketches.
 5. Correct spelling and terminology are very important. Do NOT use words like top for cylinder head.
 6. Start each question on a NEW page.
 7. Marks indicate percentages.
 8. 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 main function of a thermostat in the cooling system is to regulate the ...

- A engine pressure.
- B engine speed.
- C engine operating temperature.
- D coolant pressure.

1.1.2 When the thermostat is closed, the water circulates mainly through the ...

- A radiator.
- B water pump.
- C engine.
- D cylinder head.

1.1.3 Tyres should be inflated to their recommended pressure when they are ...

- A loaded.
- B at operating temperature.
- C hot.
- D cold.

1.1.4 A pressure relief valve is used in the engine's lubricating system to ...

- A lubricate the oil pump.
- B seal the oil pump.
- C push it upwards.
- D limit the maximum pressure.

1.1.5 Insufficient clutch pedal free-play can cause ...

- A clutch slipping.
- B excessive release bearing wear.
- C excessive clutch plate wear.
- D all of the abovementioned.

1.1.6 Excessive clutch pedal free-play can cause ...

- A excessive release bearing wear.
- B excessive clutch pedal wear.
- C difficult gear selection.
- D all of the abovementioned.

- 1.1.7 Which ONE of the following is NOT a function of the flywheel?
- A To serve as mounting facility for the gearbox
 - B To serve as mounting facility for the ring gear
 - C To serve as mounting facility for the clutch assembly
 - D To carry the engine through the non-firing strokes
- 1.1.8 The conventional sequence for tightening down cylinder heads is from ...
- A front to back.
 - B back to front.
 - C the middle towards the outer ends.
 - D the ends to the middle.
- 1.1.9 During engine operation, the intake and exhaust valves are closed by the ...
- A valve springs.
 - B camshaft.
 - C piston pressure.
 - D valve rockers.
- 1.1.10 A worn cylinder-head gasket is unlikely to cause ...
- A incorrect valve timing.
 - B overheating.
 - C engine misfire.
 - D oil dilution.

(10 × 1) (10)

- 1.2 FIGURE 1 below shows a sketch of an engine. Name the parts by writing each answer next to the letter (A–E) in the ANSWER BOOK.

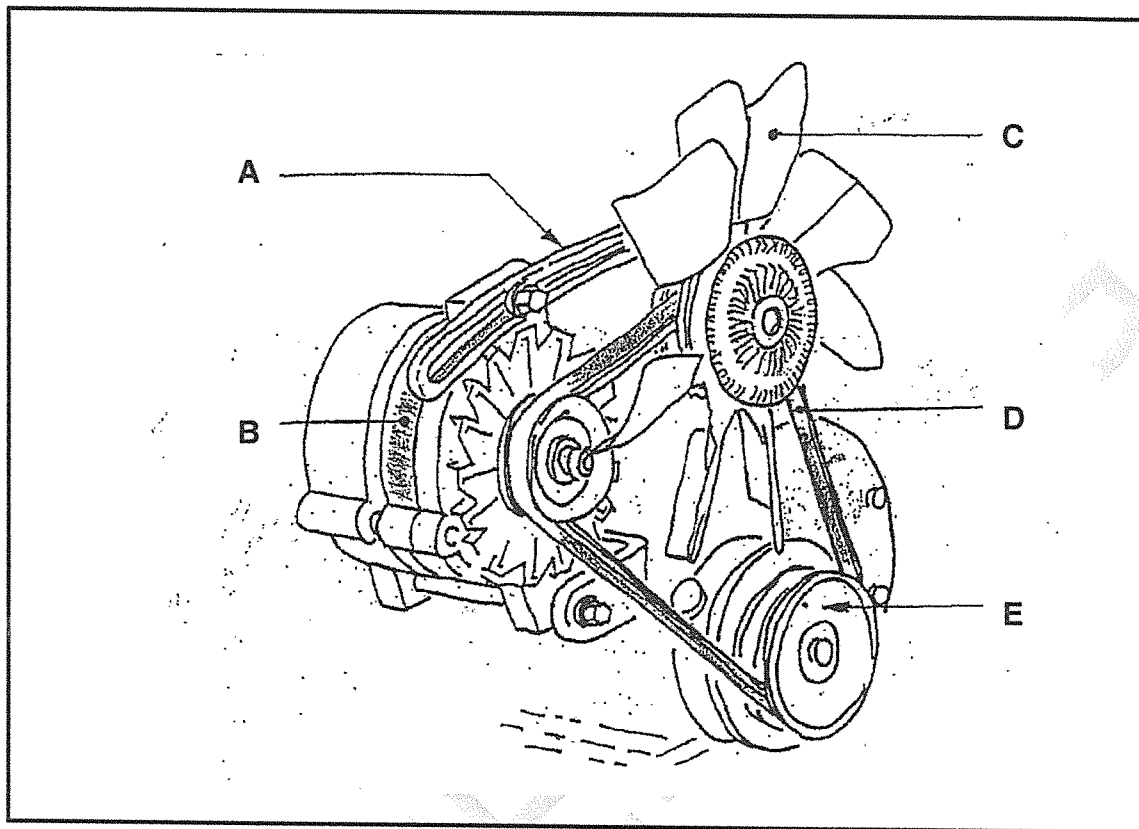


FIGURE 1

- 1.3 Name TWO types of fans which are used in an internal combustion engine.

(5)

(2)

- 1.4 Safety regulations are established in accordance with international standards. State the precautions that each of the safety signs in FIGURE 2 below illustrates. Write only the answer next to the question number (1.4.1–1.4.3) in the ANSWER BOOK.

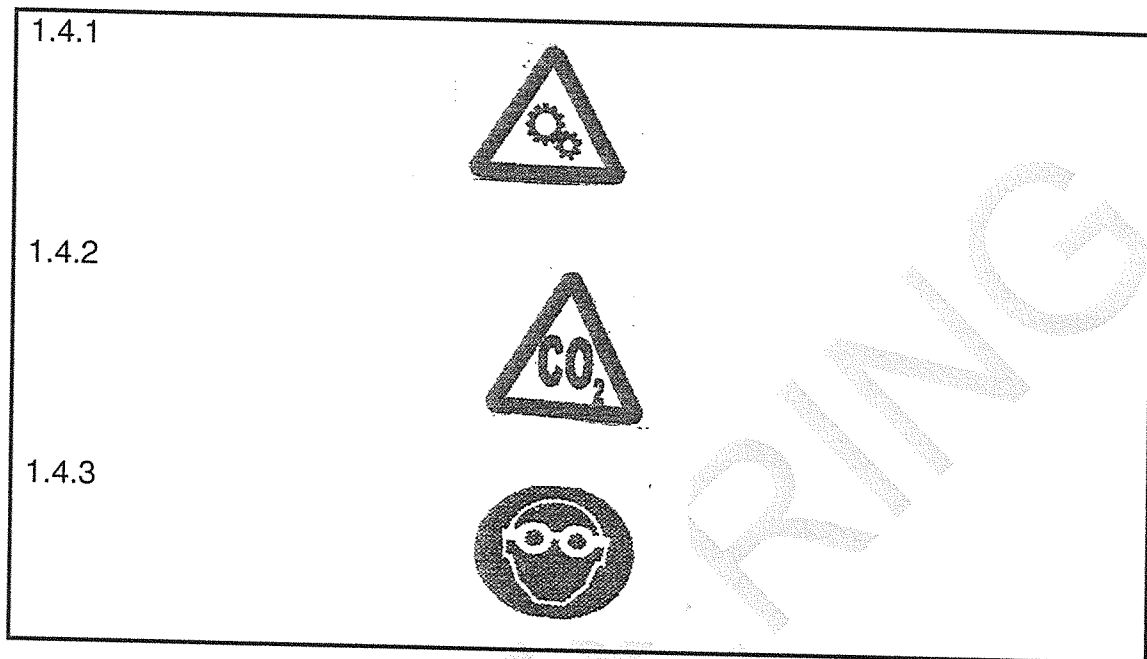
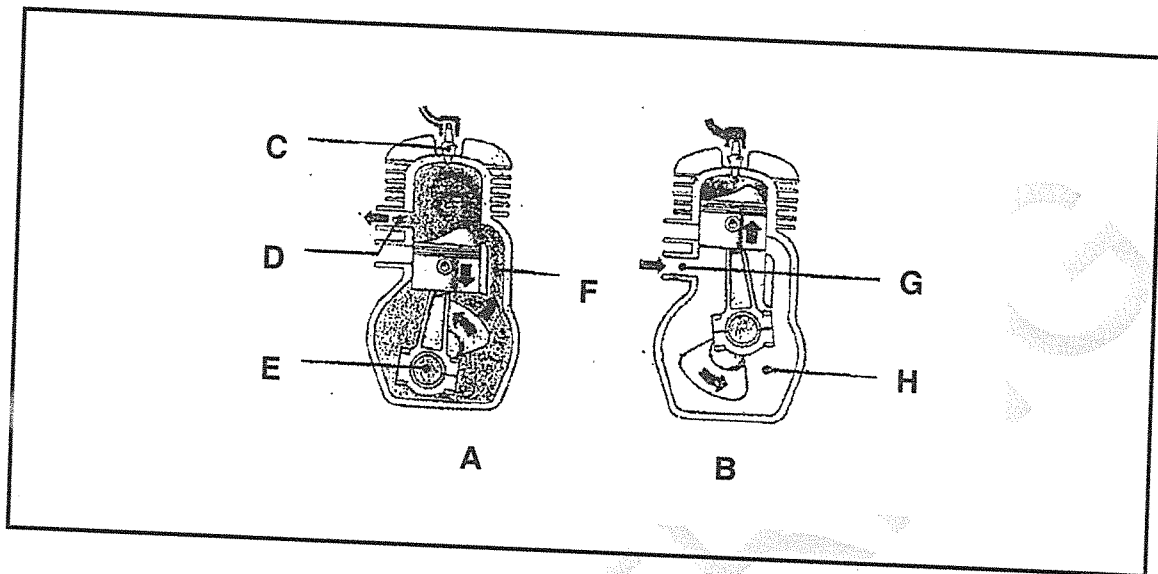


FIGURE 2

(3)
[20]

QUESTION 2

- 2.1 Study the two sketches of a two-stroke engine in FIGURE 3 below and answer the questions.

**FIGURE 3**

- 2.1.1 Name the parts illustrated by **A** and **B** in FIGURE 3 in the ANSWER BOOK. (2)
- 2.1.2 Name the parts labelled (**C–H**) in the ANSWER BOOK. (6)
- 2.2 What do the following abbreviations stand for? (4 x 1) (4)
- 2.2.1 SAE
- 2.2.2 API
- 2.2.3 TDC
- 2.2.4 BDC
- 2.3 Name TWO types of oil filter systems suitable for internal combustion engines. (2)
- 2.4 Make a large neat sectional sketch of a four stroke diesel engine during the power stroke. Draw only one cylinder and label all the parts. Show the direction of the piston by means of an arrow. (6)

[20]

QUESTION 3

3.1 State TWO functions of each of the following engine parts:

3.1.1 Crankshaft

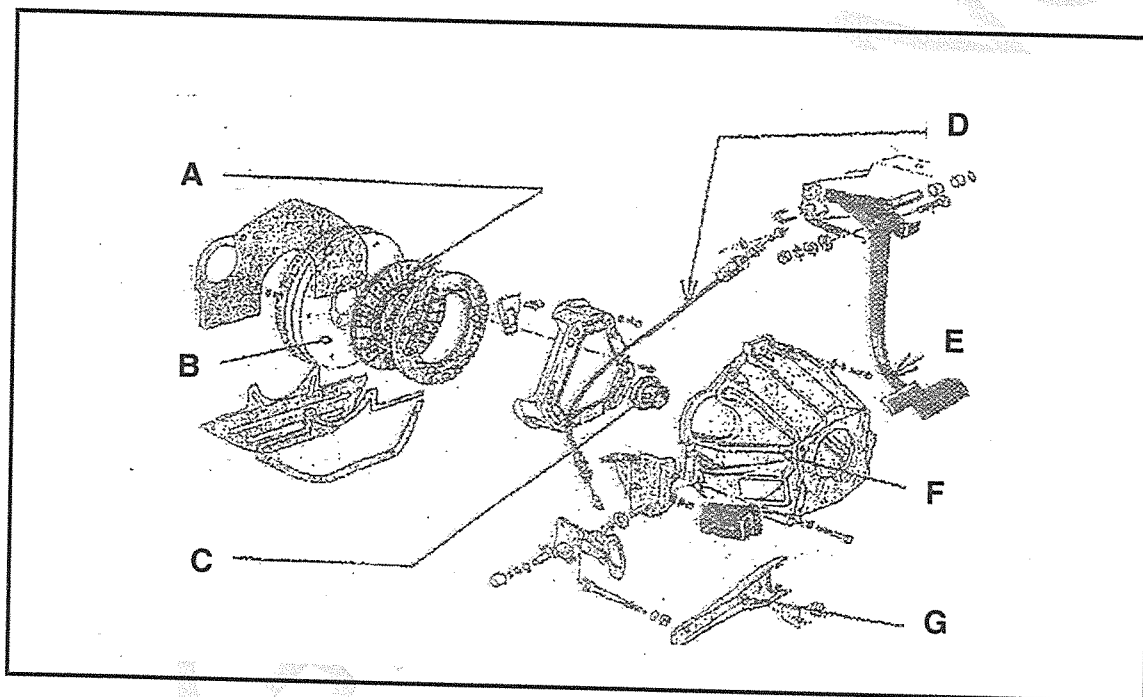
3.1.2 Camshaft

3.1.3 Flywheel

(3 x 2)

(6)

3.2 FIGURE 4 below shows a sketch of a single-plate clutch assembly. Name the parts by writing each answer next to the letter (A–G) in the ANSWER BOOK.

**FIGURE 4**

(7)

3.3 Give TWO reasons for clutch slip.

(2)

3.4 Give TWO reasons why clutch free play is important.

(2)

3.5 With reference to the water-cooled system, give THREE reasons for the overheating of an internal combustion engine.

(3)

[20]

QUESTION 4

4.1 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'true' or 'false' next to the question number (4.1.1–4.1.5) in the ANSWER BOOK.

- 4.1.1 An engine crane can be used to remove both the engine and the gearbox from the motor car.
- 4.1.2 Compression rings form a gas-tight seal to enable the air fuel mixture to be compressed.
- 4.1.3 During induction stroke of a two stroke diesel engine the pistons move upward.
- 4.1.4 The main disadvantage of an engine with front wheel drive is minimal rear tyre wear.
- 4.1.5 Lubricating oil helps to carry away heat from the moving parts of the engine.

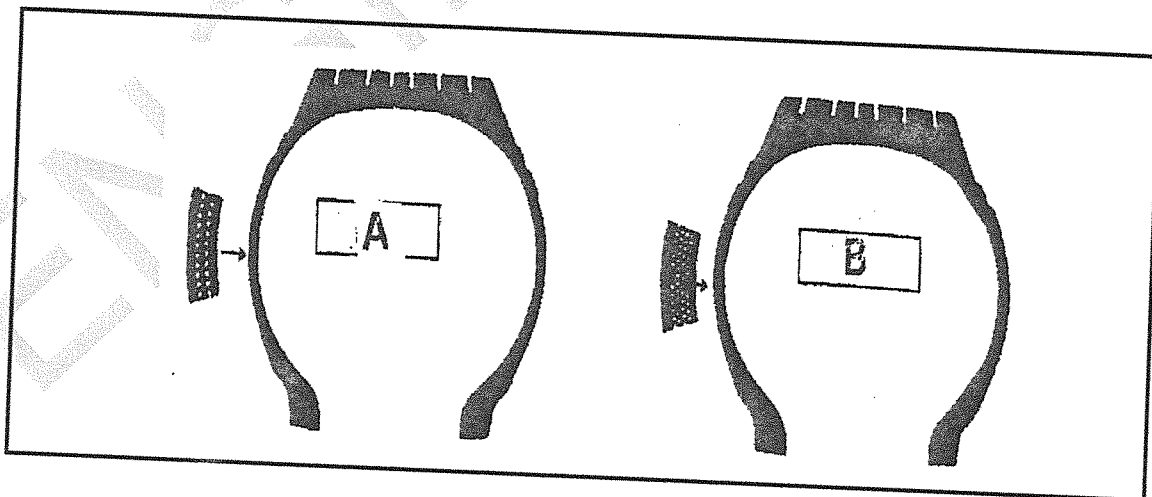
(5 × 1) (5)

4.2 Name THREE functions of engine oil used in an internal combustion engine. (3)

4.3 Give THREE reasons for high oil consumption by an engine. (3)

4.4 Name THREE functions of tyres on the vehicle. (3)

4.5 FIGURE 5 below shows TWO tyre types. Name each type of tyre. Write only the answer next to (A–B) in the ANSWER BOOK.

**FIGURE 5**

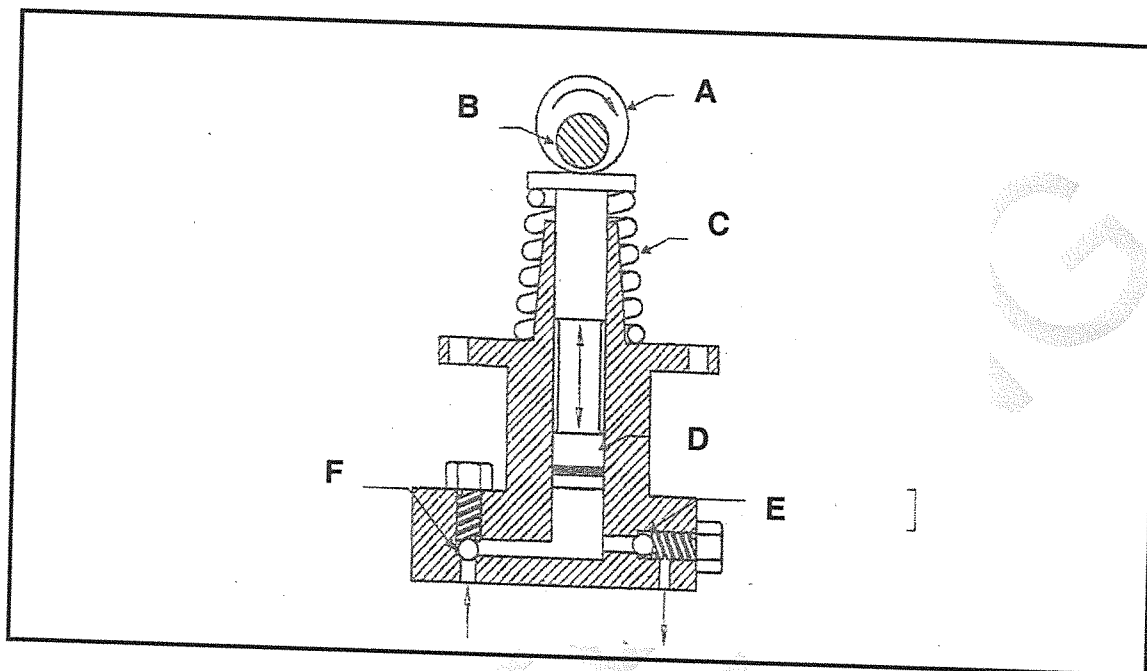
4.6 Name TWO common causes of accidents in the workshop. (2)

4.7 Name TWO functions of a thermostat. (2)

(2)
[20]

QUESTION 5

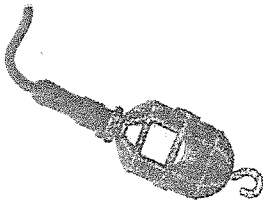
- 5.1 FIGURE 6 below shows a sketch of the parts of an internal combustion engine. Name the labelled parts (A–F) in the ANSWER BOOK.

**FIGURE 6**

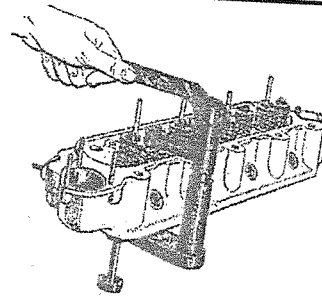
- 5.2 Name TWO defects on a motor vehicle that can be caused by a faulty lead-acid battery. (6)
- 5.3 Name TWO causes of sulphation. (2)
- 5.4 Give ONE function of the hydrometer. (2)
- (1)

5.5 FIGURE 7 below shows various tools used in the workshop. Name the tools and write each answer next to the question number (5.5.1–5.5.9) in the ANSWER BOOK.

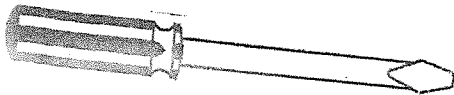
5.5.1



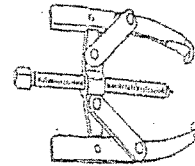
5.5.2



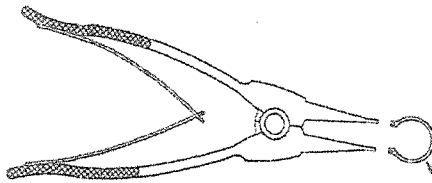
5.5.3



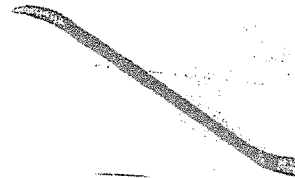
5.5.4



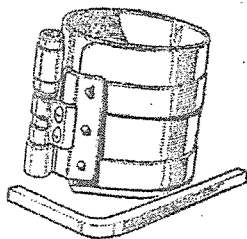
5.5.5



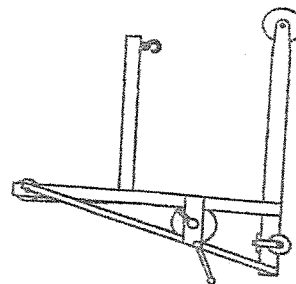
5.5.6



5.5.7



5.5.8



5.5.9



FIGURE 7

(9 × 1)

(9)
[20]

TOTAL:

100