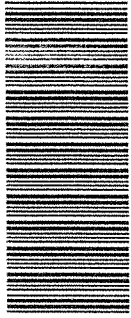


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higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T1130(E)(J21)T
AUGUST EXAMINATION

NATIONAL CERTIFICATE

MOTOR TRADE THEORY N1

(11040651)

21 July 2014 (Y-Paper)
13:00–16:00

This question paper consists of 9 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 provided with the necessary labels.
 5. Correct spelling and terminology are important.
 6. Start each question on a NEW page.
 7. Marks indicated are percentages.
 8. Write neatly and legibly.
-

QUESTION 1

1.1 Various options are provided 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 Two 12 volt batteries connected in parallel produce ... volts.
- A 12
 - B 18
 - C 24
 - D 6
- 1.1.2 The main function of the crankshaft is to ...
- A drive the clutch assembly.
 - B drive the gearbox.
 - C convert the reciprocating motion of the piston to rotary motion.
 - D convert the combustion pressure to mechanical power.
- 1.1.3 The correct sequence of strokes of a two-cylinder four-stroke engine is:
- A Compression, induction, power, exhaust
 - B Induction, compression, power
 - C Induction, compression, power, exhaust
 - D Induction, compression, power, transfer
- 1.1.4 Tyres should be inflated to the recommended pressure when they are ...
- A carrying a load.
 - B hot.
 - C cold.
 - D at operating temperature.
- 1.1.5 An engine that overheats can cause ...
- A engine seizure.
 - B a cracked cylinder head.
 - C bearing failure.
 - D All of above
- 1.1.6 Completely removing a radiator pressure cap while an engine is hot can cause ...
- A a cracked engine block.
 - B a blocked radiator.
 - C a sudden, violent burst of steam.
 - D warped valves.

- 1.1.7 The ... is the correct tool to loosen cylinder head bolts.
- A power bar
 - B torque wrench
 - C speed brace
 - D ratchet
- 1.1.8 The most accurate mechanical measuring instrument is the ...
- A vernier calliper.
 - B micrometer.
 - C dial gauge.
 - D steel rule.
- 1.1.9 If a fire brakes out in a workshop, you should not ...
- A identify the most suitable fire extinguisher.
 - B correctly operate the suitable fire extinguisher.
 - C locate fire fighting equipment and alarms in the workshop.
 - D open all doors and windows.
- 1.1.10 Used engine oil should be disposed of by ...
- A dumping it in an open field.
 - B pouring it down the drain.
 - C putting it in the rubbish bin.
 - D recycling.

(10 x 1) (10)

1.2 FIGURE 1 below shows a sketch of an engine.

Name the parts labelled A–E by writing only the answer next to the letter (A–E) in the ANSWER BOOK.

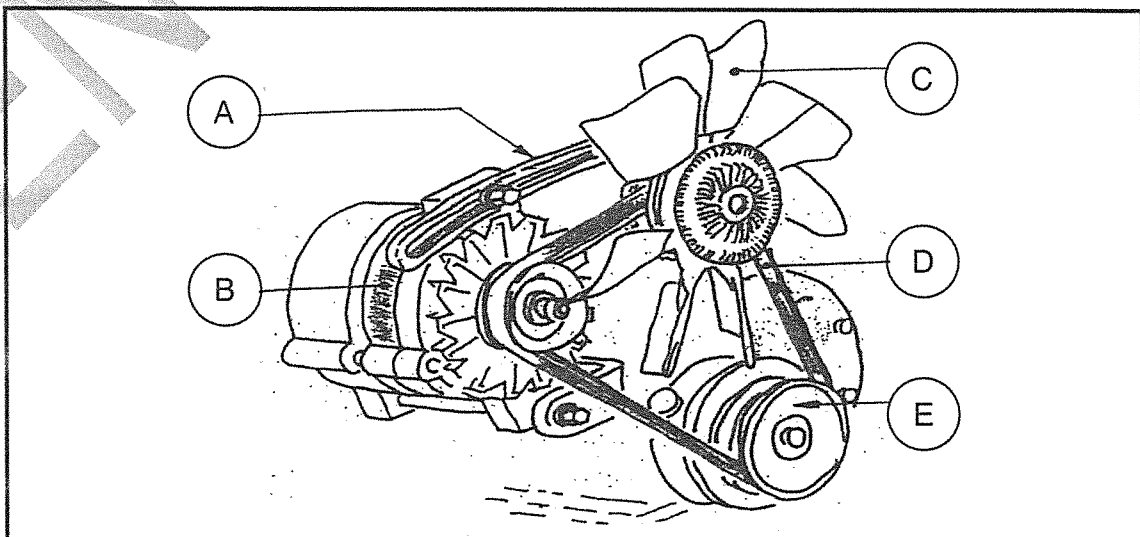


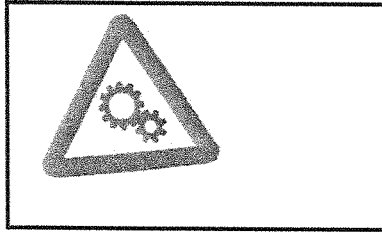
FIGURE 1

(5)

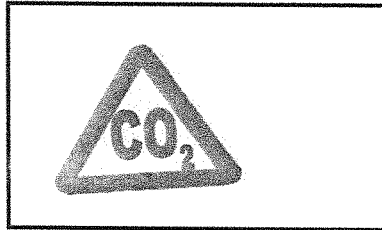
1.3 FIGURE 2 below shows various signs.

Name the sign illustrated in each sketch by writing only the answer next to the question number (1.3.1–1.3.3) in the ANSWER BOOK.

1.3.1



1.3.2



1.3.3

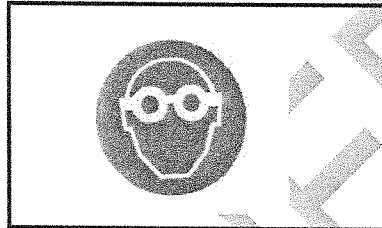


FIGURE 2

(3 x 2)

(6)
[21]

QUESTION 2

2.1 FIGURE 3 below shows the internal parts of the internal combustion engine.

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

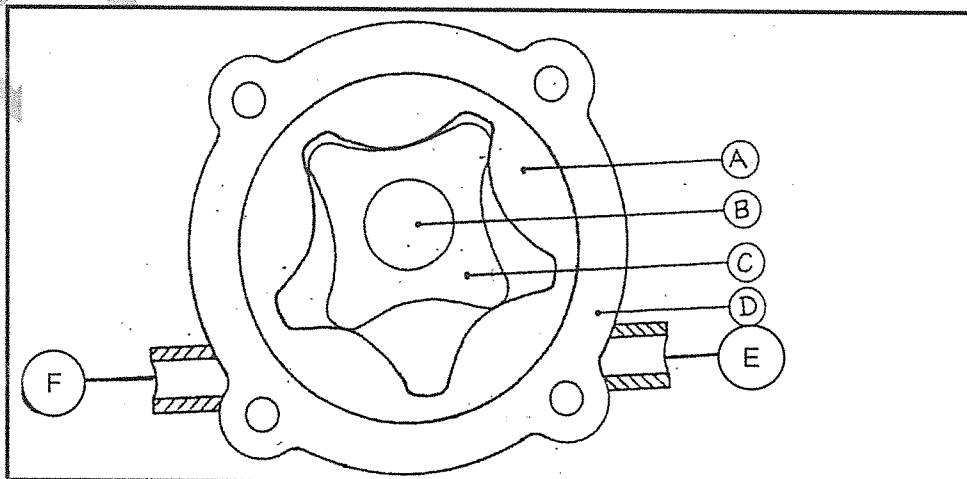


FIGURE 3

(6)

2.2 State the functions of the following:

2.2.1 Flywheel

2.2.2 Valve-stem oil seal

2.2.3 Crankshaft

(3 x 1) (3)

2.3 Name the special tools needed in each of the following cases:

2.3.1 When raising a vehicle so that a wheel can be changed

2.3.2 To insert a piston into a cylinder

2.3.3 To locate leaks in the vehicle cooling system

2.3.4 To check/measure the density of electrolyte in the battery

(4 x 1) (4)

2.4 Explain in detail the compression stroke of the four-stroke petrol (spark ignition) engine. In your explanation refer to the position of the pistons, valves and characteristics of the mixture charge and direction of piston movement.

(8)
[21]

QUESTION 3

3.1 Make a large, neat, sectional sketch of a four-stroke diesel engine during power stroke. Name all the parts of the engine and indicate the direction of the piston travel. (5)

3.2 FIGURE 4 below shows a front engine, front-wheel drive.

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

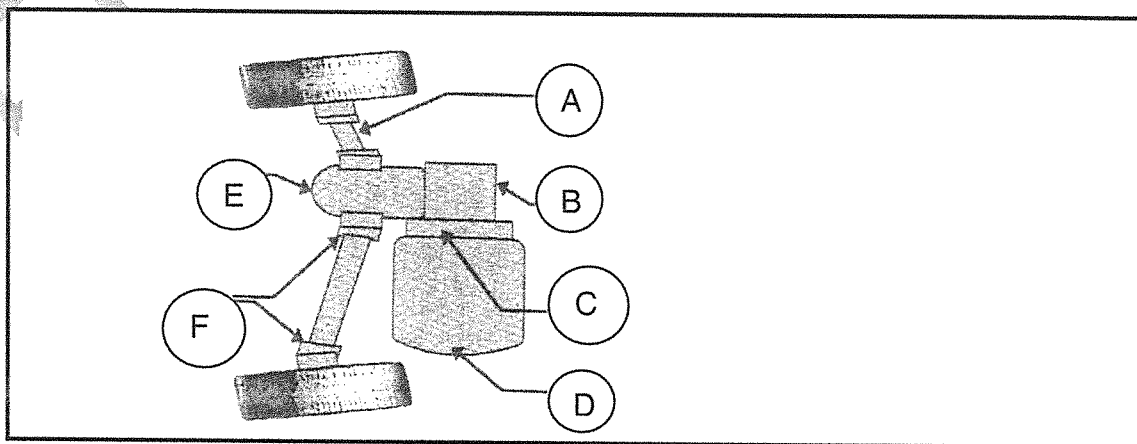


FIGURE 4

(6)

- 3.3 Explain in detail what happens in a single-plate helical spring clutch assembly when the clutch pedal is depressed. (5)
- 3.4 Give TWO disadvantages of a front engine, front-wheel drive arrangement. (2)
- 3.5 Give TWO advantages of a rear engine, rear-wheel drive arrangement. (2)

[20]

QUESTION 4

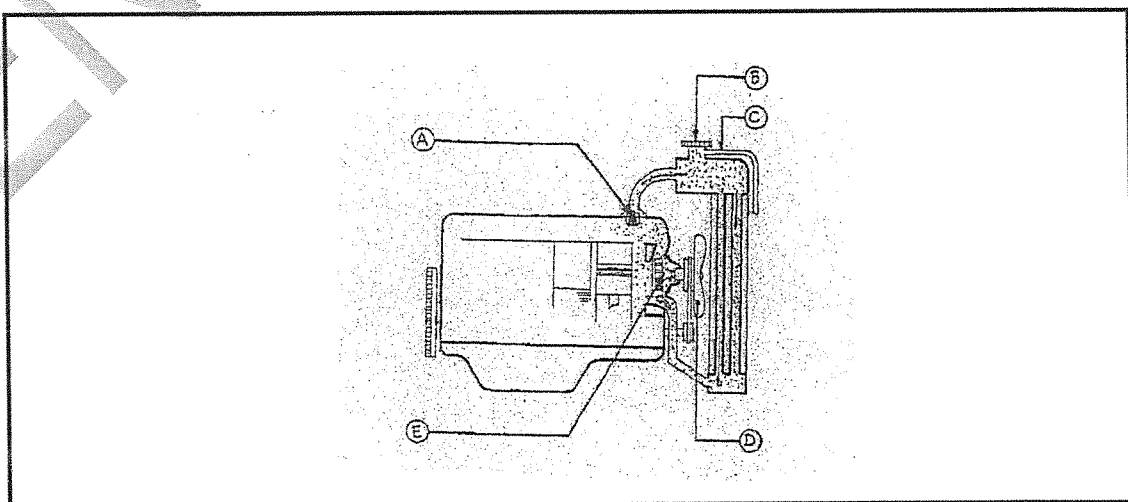
4.1 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'true' or 'false' next to the question number (4.1.1–4.1.3) in the ANSWER BOOK.

- 4.1.1 An engine overheat can be caused by a cracked cylinder head.
- 4.1.2 The correct sequence of a two-stroke four-cylinder engine is compression, induction, power and exhaust.
- 4.1.3 The main function of a crankshaft is to convert reciprocating motion of the piston into rotary.

(3 x 1) (3)

- 4.2 Name FIVE types of oil pumps that may be used in an internal combustion engine. (5)
- 4.3 Name TWO oil additives. (2)
- 4.4 Write down what SAE 40 W/50 stand for. (3)
- 4.5 FIGURE 5 shows a cooling system of an internal combustion engine.

Name the parts (A–E) by writing only the answer next to the letter (A–E) in the ANSWER BOOK.

**FIGURE 5**(5)
[18]

QUESTION 5

5.1 FIGURE 6 below shows a measuring instrument.

Name the instrument and name the parts labelled A–D by writing only the answer next to the letter (A–D) in the ANSWER BOOK.

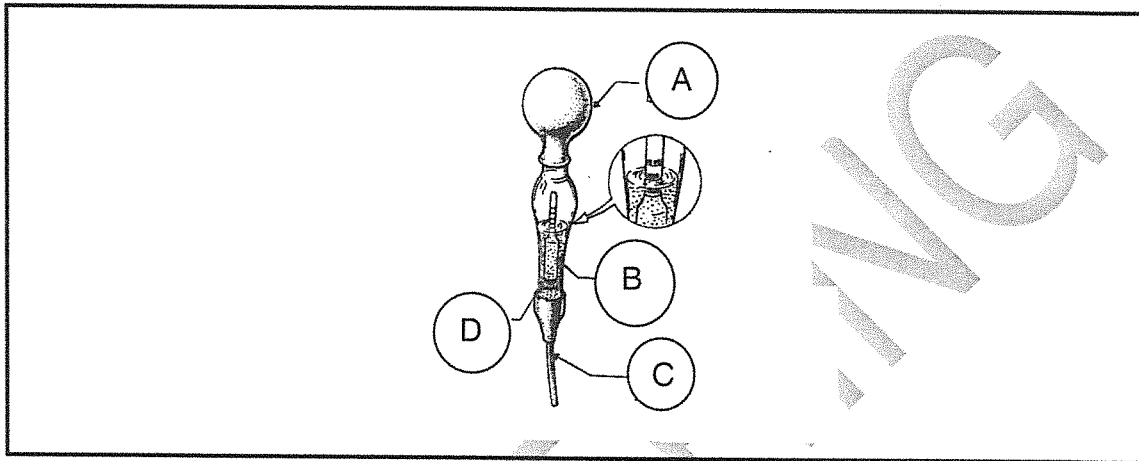


FIGURE 6

(5)

5.2 Describe how a battery is replaced in a vehicle.

(3)

5.3 State TWO functions of a tyre in a vehicle.

(2)

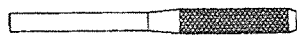
5.4 State THREE advantages of a tubeless tyre.

(3)

5.5 FIGURE 7 below shows various tools used in a workshop.

Name the tools by writing only the answer next to the question number (5.5.1–5.5.7) in the ANSWER BOOK.

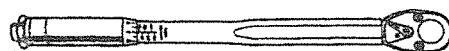
5.5.1



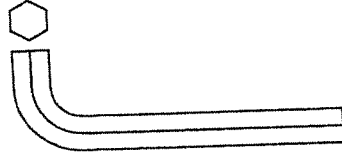
5.5.2



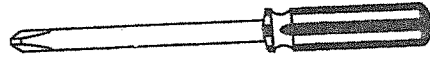
5.5.3



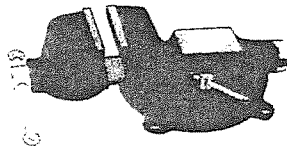
5.5.4



5.5.5



5.5.6



5.5.7

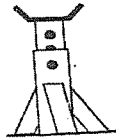


FIGURE 7

(7)
[20]

TOTAL: 100