

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 the sketches and diagrams must be large, clear and neat.
 5. Keep questions and subsections of questions together.
 6. 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 The correct sequence of strokes of a four-stroke engine is ...
- A compression, induction, power and exhaust.
 - B induction, compression, exhaust and power.
 - C induction, compression, power and transfer.
 - D induction, power, compression and transfer.
- 1.1.2 One of the advantages of good housekeeping is ...
- A poor ventilation.
 - B hazardous atmospheric conditions.
 - C inadequate support or guidance.
 - D a work area that is kept neat and orderly.
- 1.1.3 The most common hammer used in an automotive workshop:
- A Ball-peen hammer
 - B Soft-face hammer
 - C Lump hammer
 - D Mallet hammer
- 1.1.4 The timing chain is the connection between the ...
- A camshaft and crankshaft.
 - B big-end bearing and camshaft.
 - C big-end bearing and crankshaft.
 - D timing cover and gasket cover.
- 1.1.5 Dilution of motor oil can be very detrimental to an engine and its components and may be caused by ONE of the following:
- A Varnish formation
 - B Reduction of oil viscosity
 - C Low oil pressure
 - D Leaking injector
- 1.1.6 Tyres should be inflated to the recommended pressure when they ...
- A are carrying a load.
 - B are hot.
 - C are cold.
 - D are at the operating temperature.

1.1.7 An engine that overheats can cause ...

- A engine seizure.
- B a cracked cylinder head.
- C bearing failure.
- D All the above-mentioned.

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

- A clutch slipping.
- B excessive clutch-plate wear.
- C excessive release-bearing wear.
- D All the above-mentioned.

1.1.9 The conventional sequence for tightening down the cylinder head is from ...

- A front to back.
- B back to front.
- C the middle towards the outer ends.
- D the ends to the middle.

1.1.10 The main function of the thermostat in a cooling system is to regulate the ...

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

(10 × 1) (10)

1.2 FIGURE 1, DIAGRAM SHEET 1 (attached) shows a two-stroke petrol engine.

Name the parts labelled A–G. Write only the answer next to the letter (A–G) in the ANSWER BOOK.

(7 × 1) (7)

1.3 Give the names of the tools required for each of the following tasks:

1.3.1 To finish off corners and cutting V-grooves

1.3.2 To tighten the cylinder-head bolt

1.3.3 To check small gaps between components

(3 × 1) (3)
[20]

QUESTION 2

2.1 FIGURE 2, DIAGRAM SHEET 1 (attached) shows a sketch of the flywheel of an internal combustion engine.

Name the parts labelled A–F. Write only the answer next to the letter (A–F) in the ANSWER BOOK. (6 × 1) (6)

2.2 State the main function of each of the following engine components:

- 2.2.1 Connecting rod
 - 2.2.2 Radiator fan
 - 2.2.3 Thermostat
 - 2.2.4 Oil pump
 - 2.2.5 Spark plug
- (5 × 1) (5)

2.3 Name FOUR types of oil pumps used in an internal combustion engine. (4)

2.4 FIGURE 3, DIAGRAM SHEET 1 (attached) shows a sketch of the oil pump of an internal combustion engine.

Name the parts labelled A–E. Write only the answer next to the letter (A–E) in the ANSWER BOOK. (5 × 1) (5)

[20]

QUESTION 3

3.1 Make a large, neat, sectional sketch of a four-stroke diesel engine (C.I) during the power stroke. Draw only one cylinder and label all the parts. The piston direction must be indicated by means of arrows.

Also give a brief explanation of its operation. (7)

3.2 Define *oil clearance*. (3)

3.3 Give THREE reasons for low engine-oil pressure although there is enough oil in the sump. (3)

3.4 FIGURE 4, DIAGRAM SHEET 2 (attached) shows the single-plate clutch assembly.

Name the parts labelled A–G. Write only the answer next to the letter (A–G) in the ANSWER BOOK. (7 × 1) (7)

[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 Hardness is the opposite of brittleness.
- 4.1.2 Overhead camshaft means the camshaft is situated below the cylinder head.
- 4.1.3 Constant velocity joints are found on front-wheel drive cars.
- 4.1.4 The main function of the radiator is to increase the engine temperature.
- 4.1.5 One of the functions of engine oil is to act as a cushion to protect the moving parts. (5 × 1) (5)
- 4.2 Name THREE common causes of accidents in the workshop. (3)
- 4.3 State THREE functions of the thermostat. (3)
- 4.4 FIGURE 5, DIAGRAM SHEET 2 (attached) shows a sketch of the cooling-system parts of the internal combustion engine.
Name the parts labelled A–E. Write only the answer next to the letter (A–E) in the ANSWER BOOK. (5 × 1) (5)
- 4.5 Give FOUR causes of engine overheating. (4)
- [20]**

QUESTION 5

- 5.1 Give THREE good sawing techniques. (3)
- 5.2 Give TWO safety measures when working on a grinding machine. (2)
- 5.3 Give THREE reasons for accidents in the workshop due to poor housekeeping. (3)
- 5.4 Give FIVE reasons why it is important that correct tyre pressure be maintained. (5)
- 5.5 FIGURE 6, DIAGRAM SHEET 3 (attached) shows various tools used in the workshop.
Name the tools numbered 5.5.1–5.5.7. Write only the answer next to the question number (5.5.1–5.5.7) in the ANSWER BOOK. (7 × 1) (7)
- [20]**

TOTAL: 100

DIAGRAM SHEET 1

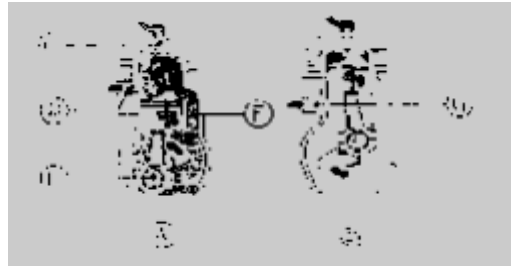


FIGURE 1

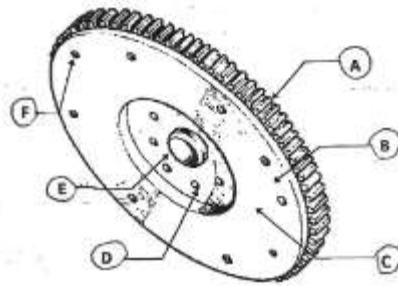


FIGURE 2

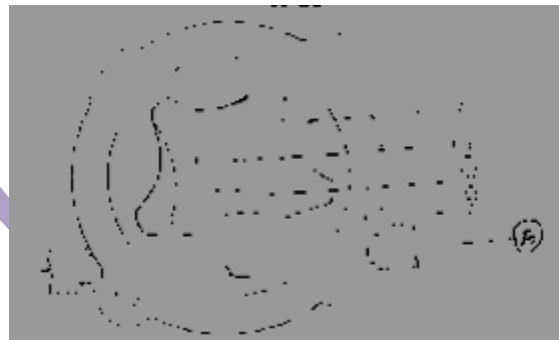


FIGURE 3

DIAGRAM SHEET 2

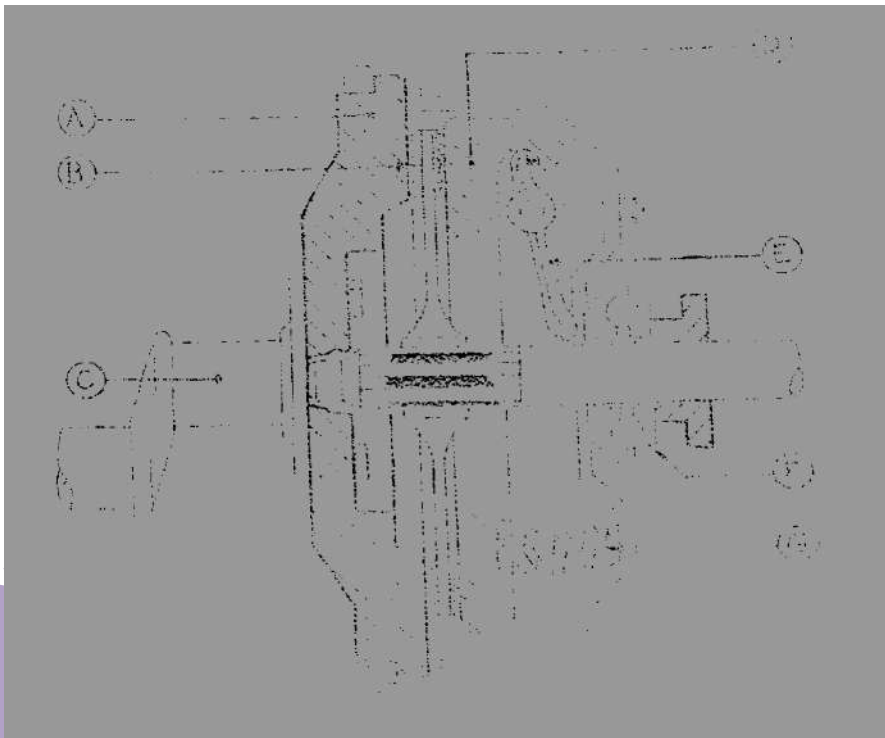


FIGURE 4

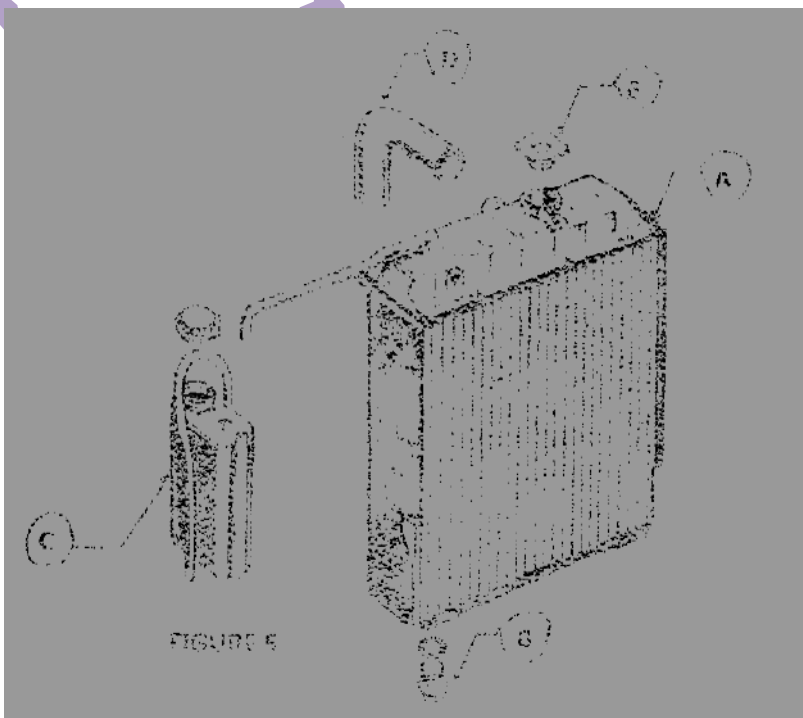
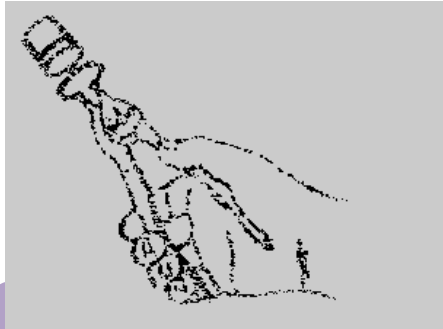


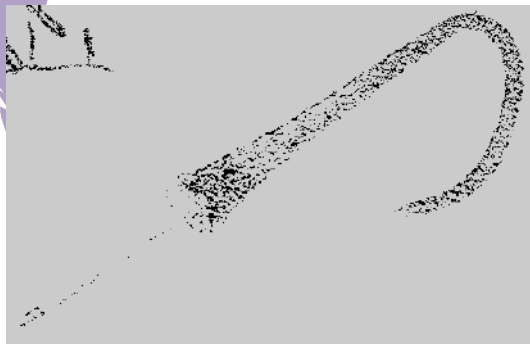
FIGURE 5

DIAGRAM SHEET 3

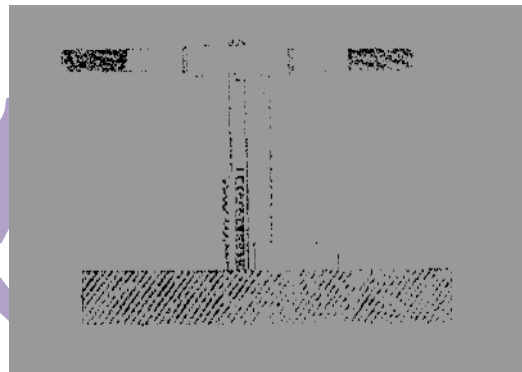
5.1 5.5.1



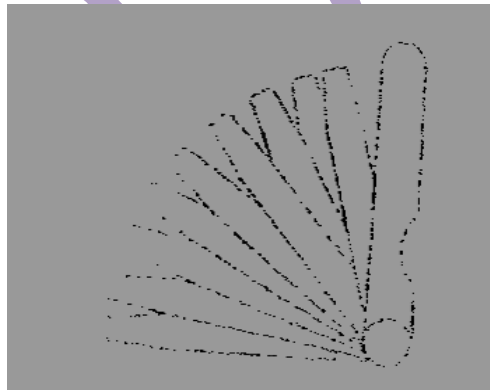
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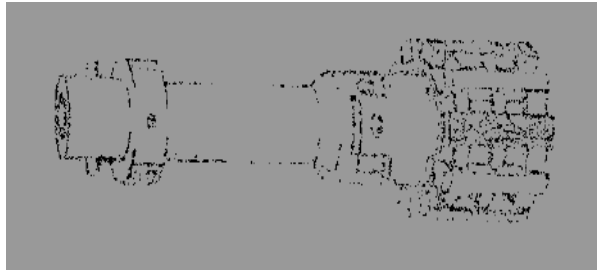
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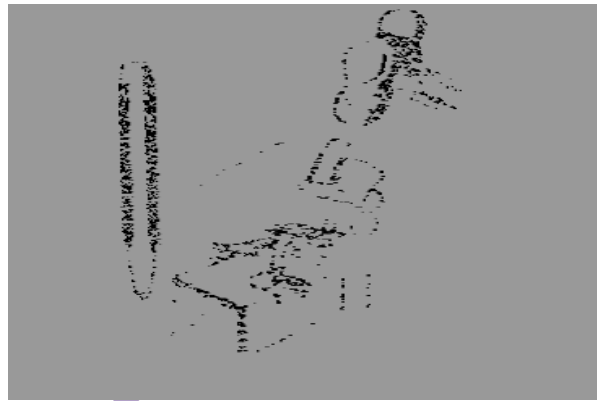
5.5.4



5.5.5



5.5.6



5.5.7

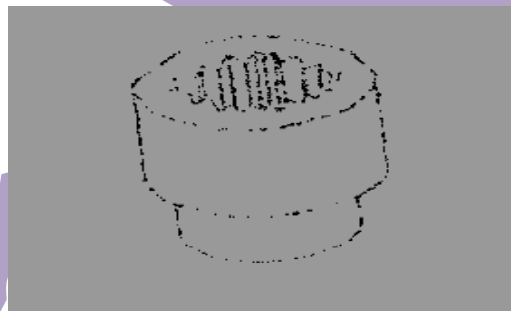


FIGURE 6