higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE

MOTOR TRADE THEORY N1

(11040651)

13 April 2021 (X-paper)
09:00–12:00

Drawing instruments may be used.

This question paper consists of 6 pages.

148Q1A2113

Copyright reserved

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. Start each question on a new page.
5. Use only a black or blue pen.
6. Write neatly and legibly.

Copyright reserved

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 Protects one's head from falling objects:

A Earmuffs
B Hard hat/Safety helmet
C Heat shield
D Safety goggles

1.1.2 The most important tool to use when inserting a piston and rings into a cylinder:

A Hammer
B Ring expander
C Ring squeezer
D Bearing puller

1.1.3 A hacksaw is used to cut …

A hardened steel.
B most metals.
C glass objects.
D rubber pipes.

1.1.4 A cylinder sleeve that is in direct contact with cooling water is called a … sleeve.

A wet
B dry
C water
D cooling

1.1.5 Which ONE of the parts of a poppet valve mates with the valve seat?

A Valve face
B Valve head
C Valve stem
D Valve margin

1.1.6 The engine component responsible for smoothing the crankshaft rotation:

A Flywheel
B Harmonic balancer
C Crankshaft balance weights
D Big ends/Connecting rods

Copyright reserved

1.1.7 An inside micrometer is generally used to measure …

A blind holes.
B piston sizes.
C cylinder bore sizes.
D crankshaft end floats.

1.1.8 On a four-stroke engine the outlet valve is open during the … stroke.

A inlet
B exhaust
C compression
D power

1.1.9 Most sports cars use this engine layout:

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

1.1.10 The main constituent in tyre manufacturing:

A Branding agents
B Rayon
C Steel
D Rubber

(10 × 1) (10)

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

1.2.1 The main function of a battery is to supply power to the alternator.

1.2.2 One of the advantages of the fuel-injection system is that the fuel mixture can be measured exactly for all engine conditions.

1.2.3 Compared to monograde oils the characteristics of multigrade oil are favourable for extreme ranges of operating temperatures.

1.2.4 Most modern engines use a splash-lubrication system to lubricate the crankshaft bearings.

1.2.5 Engines have oil seals and gaskets to prevent oil leaks.

1.2.6 The operating principle of the thermosyphon cooling system is that hot water rises and cool water sinks.

Copyright reserved

1.2.7 The radiator cap maintains a predetermined pressure in the cooling system.

1.2.8 The electric fan is a type of nonpermanent cooling fan.

1.2.9 It is advisable to lightly oil the clutch plate to ensure the smooth take-up of power.

1.2.10 Hydraulically operated clutch systems are self-adjusting.

(10 × 1) (10)
[20]

QUESTION 2

2.1 List SIX visible signs of poor housekeeping. (6)

2.2 Complete the table below by writing only the name of the tool next to the question number (2.2.1–2.2.5) in the ANSWER BOOK.

USE		NAME OF TOOL
2.2.1	Tighten bolts or nuts to a specified tightness	
2.2.2	Tighten or loosen brakepipe connectors	
2.2.3	Tighten or loosen normal bolts or nuts	
2.2.4	Tighten or loosen bolts and nuts that are not normal sizes	
2.2.5	Tighten or loosen bolts or nuts in awkward spaces	

(5 × 1) (5)

2.3 Explain how to check a cylinder head for straightness. (5)
[16]

QUESTION 3

3.1 Explain the effects of both over- and under-inflation of tyres. (8)

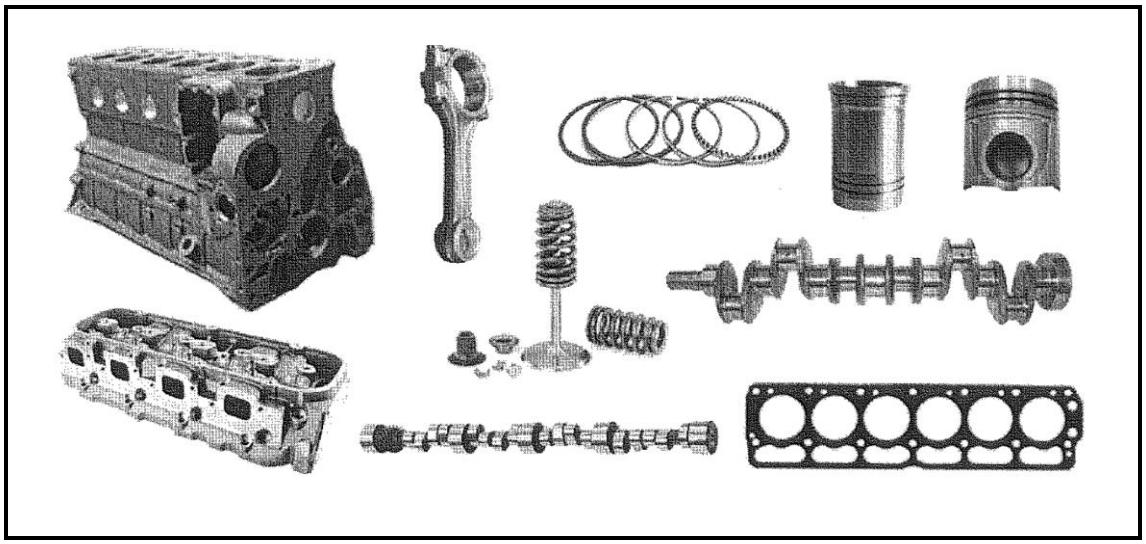
3.2 Explain what it means when a battery is marked as 50 Ah. (3)

3.3 Draw a neat, labelled sketch of a conventional hydrometer. (6)
[17]

Copyright reserved

QUESTION 4

4.1



Identify any 10 of the main engine components shown above. (10)

4.2 Explain, with the aid of a simple line sketch, the exhaust stroke of a four-stroke petrol engine. Pay special attention to the position of the valves and movement of the piston. (6)

[16]

QUESTION 5

5.1 List the THREE main components of a clutch assembly. (3)

5.2 Explain how power is transmitted through a clutch. (4)

5.3 Name the FOUR main components of a hydraulic clutch-actuation system. (4)

5.4 Give FOUR advantages of hydraulic clutch-actuating systems. (4)

5.5 Explain how indirect cooling occurs in a water-cooled engine. (3)

[18]

QUESTION 6

6.1 Draw a labelled sketch of a full-flow oil-filtering system as used in car engines. (6)

6.2 List SIX causes of high oil consumption. (6)

6.3 Which component in the lubrication system helps to control oil temperature? (1)

[13]

TOTAL: 100

Copyright reserved