higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T1240**(E)**(A4)T

NATIONAL CERTIFICATE

MOTOR TRADE THEORY N3

(11040673)

4 April 2019 (X-Paper)
09:00–12:00

This question paper consists of 5 pages.

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
MOTOR TRADE THEORY N3
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. FORMULAE:

$$C.R. = \frac{V_s + V_c}{V_c} \quad V_s = \frac{\pi d^2}{4} \times SL \qquad N = 1 - \left(\frac{1}{r}\right)^{0.4} \quad h = \frac{SL}{CR - 1}$$

5. Write neatly and legibly.

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QUESTION 1

1.1 Indicate whether the following statements are TRUE or FALSE. Choose the answer and write only 'True' or 'False' next to the question number (1.1.1–1.1.7) in the ANSWER BOOK. Correct the statement if it is FALSE.

1.1.1 Chronological filing is done by grouping cards in consecutive number order.

1.1.2 The advantage of an electronic filing system is to save space and time.

1.1.3 The receptionist in an automotive repair workshop must be bilingual, and assertive and not listen to client complaints.

1.1.4 Floor space regulations state that no employer shall allow any staff to work in a room that is less than 3 m in height.

1.1.5 Always ensure that splash guards are removed from machines where lubricants are required before it is switched on.

1.1.6 Change rooms shall be well-light, ventilated and in good and clean condition at all times to ensure that a high standard of health and safety is maintained.

1.1.7 The employer shall provide personal protective equipment free of charge to all the workers to reduce the risk of injury to employers. (10)

1.2 List FIVE factors that should be considered when budgeting for new workshop equipment. (5)

1.3 Explain TWO types of oil flow that occurs in a torque converter during operation. (2)

1.4 Name the THREE main components of a torque converter. (3)

1.5 State TWO advantages of the transistor ignition system with contact breaker points. (2)

1.6 State THREE advantages of the transistor ignition system without contact breaker points. (3)

[25]

QUESTION 2

2.1 At what pressure does a low-pressure fuel injection system operate? (2)

2.2 Describe in detail how a time-measured fuel injection operates. (8)

2.3 Explain the function of the following components in an automatic gearbox:

2.3.1 Valve body (2)

2.3.2 Oil pump (2)

2.4 Draw a neat, sectional Epicyclic gear set clearly illustrating and labelling the following components:

2.4.1 The Annulus (2)

2.4.2 Planetary Gears (2)

2.4.3 Planetary Carrier (2)

2.4.4 Sun Gear (2)

2.5 What is the function of the crankshaft in an internal combustion engine? (1)

2.6 Identify and explain TWO causes of low volumetric efficiency in an engine. (2)

[25]

QUESTION 3

3.1 List FIVE checks that a mechanic must do before servicing the power steering system on a vehicle. (5)

3.2 State the Function of the power piston found in a gear type power-assisted steering. (3)

3.3 State TWO disadvantages of power steering system. (2)

3.4 Explain the differences between the Single Speed Double Reduction Final Drive and the Two Speed Double Reduction Final Drive. (6)

3.5 Name TWO differences between tandem drive and four-wheel drive. (4)

3.6 Explain why some vehicles are equipped with DIFFERENTIAL LOCKS (5)

[25]

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QUESTION 4

4.1 The air standard efficiency of an engine is 61%.

Calculate the compression ratio. (5)

4.2 The cylinder diameter and stroke length of an engine with a compression ratio of 7,4:1 is respectively 70 mm and 83 mm.

Calculate the volume of the combustion chamber in cubic centimetres. (6)

4.3 4.3.1 State THREE advantage of the I-head engine. (3)

4.3.2 State TWO advantages T-head engine (2)

4.4 Study Figure 1 below and label the parts of the valve arrangement. Write only the answer next to the letter (A–G) in the ANSWER BOOK. (7)

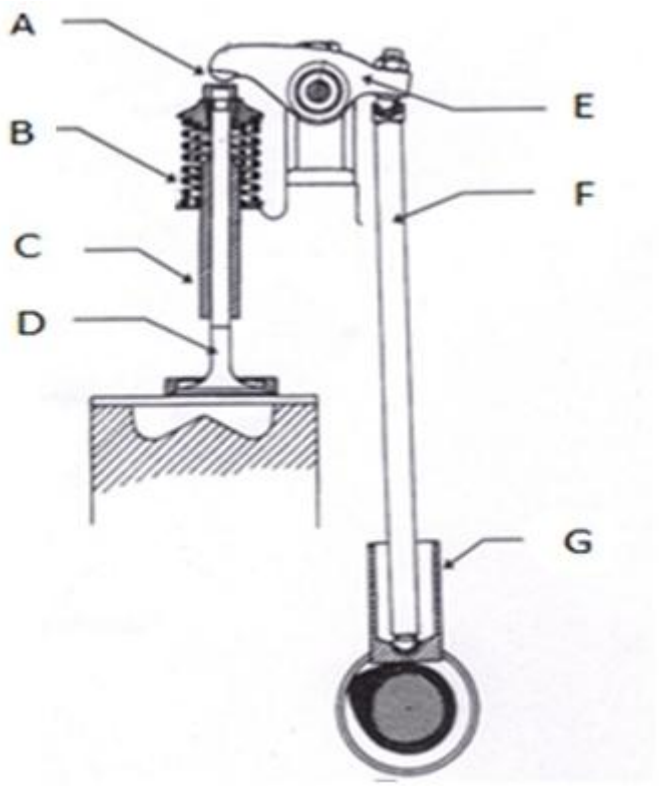

Figure 1

4.5 What is the function of the part labelled B in Figure 1 above. (2)

[25]

TOTAL: 100

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