higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T380**(E)**(M31)T
**APRIL EXAMINATION**

# NATIONAL CERTIFICATE

# DIESEL TRADE THEORY N2

(11040192)

**31 March 2016 (X-Paper)**
**09:00–12:00**

**This question paper consists of 6 pages.**

# DEPARTMENT OF HIGHER EDUCATION AND TRAINING
# REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE
DIESEL TRADE THEORY N2
TIME: 3 HOURS
MARKS: 100

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**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. 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 (1.1.1–1.1.10) in the ANSWER BOOK.

1.1.1 A diesel engine is an example of an external combustion engine.

1.1.2 A cylinder block contains one or more cylinders in which each piston is located.

1.1.3 The piston and piston rings transmit the force of the expanding gas to the connecting rod.

1.1.4 A diesel engine is often less noisier than a petrol engine.

1.1.5 A petrol engine needs more fuel filters than a diesel engine.

1.1.6 A diesel fuel system will work properly if air is trapped in the fuel system.

1.1.7 A good quality oil of the recommended grade is essential to reduce engine wear to the minimum.

1.1.8 The teeth of Spur gears are machined at an inclined angle.

1.1.9 Helical gears are cheaper than Spur gear to manufacture.

1.1.10 The advantage of double helical gears is that the opposed tooth shape minimizes sideways thrust and it can transmit more torque.

(10 x 1) (10)

1.2 FIGURE 1 shows a sectioned view of a 3rd and 4th synchromesh unit used on a four speed gearbox.

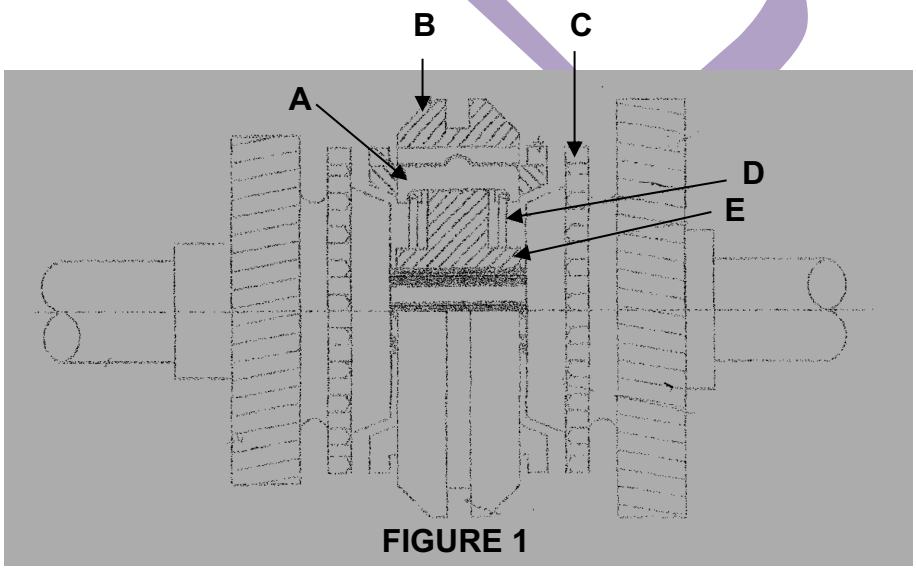


**FIGURE 1**

1.2.1 Label items [A-E] in your ANSWER BOOK. (5)

1.2.2 Explain the operation of the synchromesh when the driver changes from 3rd gear to 4th gear. (5)
**[20]**

**QUESTION 2**

2.1 Re-draw, and complete the table below by listing **FOUR** advantages and **FOUR** disadvantages of hydraulic brakes on a vehicle.

| ADVANTAGES | DISADVANTAGES |
|---|---|
| 1) | 1) |
| 2) | 2) |
| 3) | 3) |
| 4) | 4) |

(8)

2.2 State the procedure to be followed when bleeding a hydraulic braking system.
Begin with the preparation and continue with the procedure of bleeding the brake system. (8)

2.3 Give FOUR reasons for a pressure built up in a hydraulic brake system. (4)
**[20]**

**QUESTION 3**

3.1 FIGURE 2 show a sectioned view of a drive shaft joint.

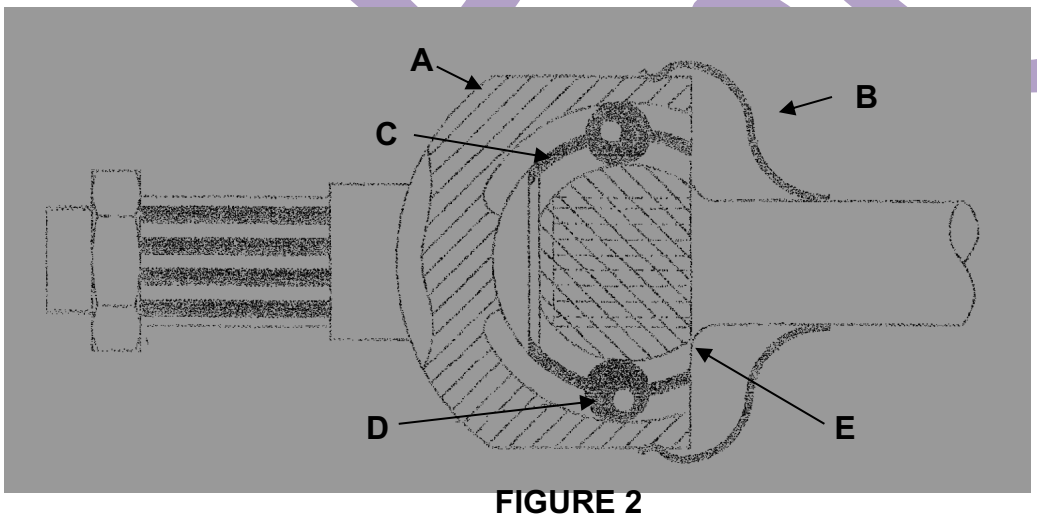


**FIGURE 2**

3.1.1 Label items [A- E] in your ANSWER BOOK. (5)

3.1.2 Name the drive shaft joint shown in FIGURE 2. (1)

3.1.3 State **FOUR** advantages of the joint shown in FIGURE 2 compared to other universal joints. (4)

3.2 FIGURE 3 shows a sectioned view of a Hydraulic shock absorber.

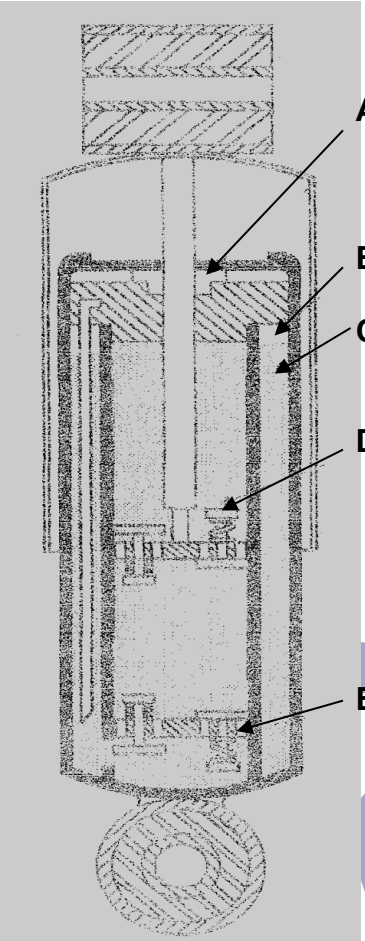


**FIGURE 3**

3.2.1 Label items [A-E] in your ANSWER BOOK. (5)

3.2.2 Explain the operation of a shock absorber when a vehicle is driven over a speed bump. (5)

**[20]**

**QUESTION 4**

4.1 State ONE reason why it is necessary to adjust a steering box within its specifications. (1)

4.2 4.2.1 List THREE methods used to adjust play on a steering box. (3)

4.2.2 Explain how each of the methods in question 4.2.1 is used to adjust play in a steering box. (6)

4.3 Give THREE causes off the following gearbox problems:

4.3.1 Gears grate when being changed. (3)

4.3.2 Gearbox noisy when engaged in gear. (3)

4.4 State FOUR advantages of a Hotchkiss drive. (4)

**[20]**

 

## QUESTION 5

5.1 FIGURE 4 shows four types of injector nozzles.

Name each injector next to (a-d) in YOUR ANSWER BOOK. (4)

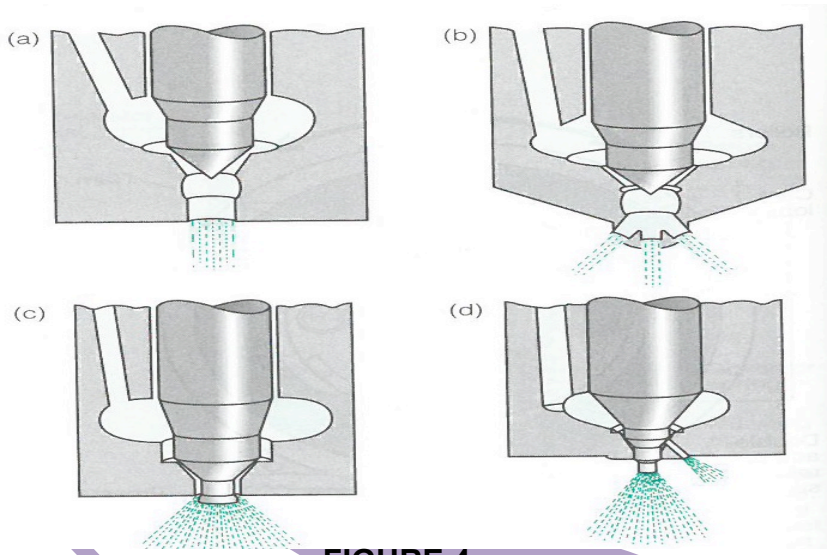


**FIGURE 4**

5.2 Give **THREE** characteristics of a good brake fluid. (3)

5.3 Name **THREE** types of pre-combustion chamber designs used on diesel engines. (3)

5.4 FIGURE 5 shows a Fuel injection system of a diesel engine.

Label items (A- E) in your ANSWER BOOK.

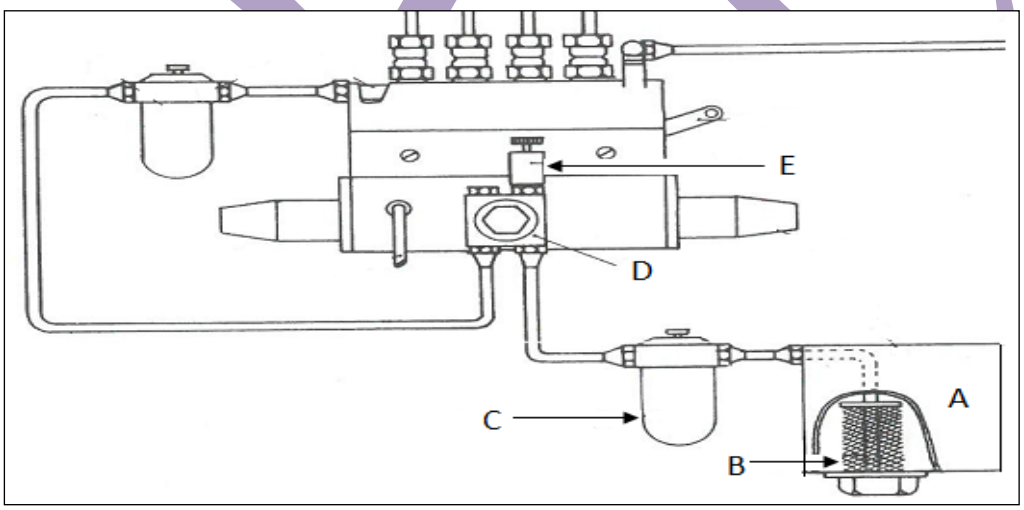


**FIGURE 5** (5)

5.5 Explain the difference between curb height and curb mass of a vehicle. (5)

**[20]**

**TOTAL: 100**