



NZQA accredited and registered provider

Emissions

PRACTICE PAPER ONLY

Test Paper One / Time allowed 90 mins

To be completed by the student

Student Name _____ **Date** __ / __ /2020

School/Provider _____

To be completed by the School Invigilator/Coordinator/Tutor

I confirm that this assessment was completed by the student named above as a closed book exercise under exam conditions

Invigilator Name _____

Invigilator Sign _____

Assessed By _____

Date __ / __ / 2020

**Assessor's
Stamp**

Assessors Note: Materials relate to unit standard 5461-30435

SAMPLE ASSESSMENT INSTRUCTIONS

PLEASE MAKE SURE TO READ AND SIGN THIS SECTION

ASSESSMENT INSTRUCTIONS

- Before undergoing this assessment it is expected that the candidate will have achieved a mark of at least 80% for the corresponding workbook.
- This is a closed book assessment
- The assessment must be completed under exam conditions.
- To achieve the standard students must demonstrate competency for each element.
- Please read the questions carefully.
- Provide detailed answers to the questions.
- Candidates must record their full name.
- Resources required: Pen (do not use pencil)

For the following questions please circle Yes or No as appropriate:

Are you ready to be assessed? **Yes No**

Do you understand the assessment instructions, have these been explained to you? **Yes No**

Have you all the materials/resources that you need for this assessment? **Yes No**

Please sign to acknowledge that you have read these instructions and are ready to be assessed.

Candidate Signature _____ Date _____

ELEMENT ONE

Demonstrate knowledge of fuel emissions.

1. **Describe how fuel emissions can make people sick.**

2. **Describe how fuel emissions can harm plant and animal life.**

3. **Describe how fuel emissions can contribute to the depletion of the ozone layer in the earth's atmosphere.**

4. **Which vehicle emission gases are considered greenhouse gases and therefore contribute to global warming?**

5. **Environmental Law is a complex combination of state, federal, and international treaty law pertaining to issues of concern to the environment and protecting natural resources. For example, environmental laws often relate to issues such as pollution of soil, air, or water; global warming; and depletion of oil, coal, and clean water.**

Explain how environmental regulations/laws have affected each of the following:

- 5a. The design of cities and urban areas

- 5b. The use of bio-fuels and alternative fuels

- 5c. Technology improvements (Engines and fuel systems)

- 5d. Land transport rules

5e. Environmental legislation (laws)

5f. Fuel specifications (Petrol and diesel)

5g. International emission standards affecting vehicle specifications

6. For each of the following gases and by-products of combustion describe both their composition (makeup) and what engine performance condition is most likely to contribute to the production of them.

6a. Particulates

Composition: _____

Engine performance condition that would produce excess particulates:

6.b. NO_x

Composition: _____

Engine performance condition that would produce excess NO_x:

6.c. **HC**

Composition: _____

Engine performance condition that would produce excess HC:

6.d. **CO**

Composition: _____

Engine performance condition that would produce excess CO:

7. The relationship between Oxygen (O₂) and Carbon dioxide (CO₂) levels present in exhaust emissions is often described as the best indicators of how good the combustion is.

Consider the following scenario;

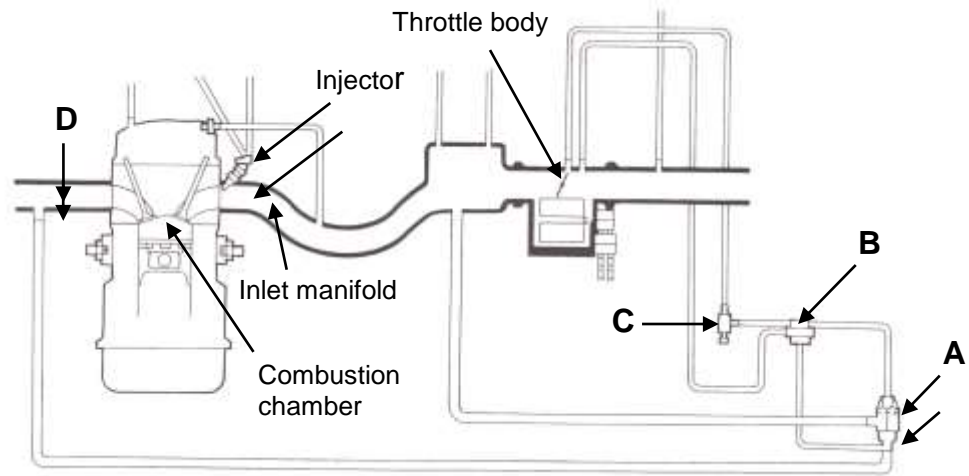
**A technician is testing the exhaust emissions of a vehicle.
The results show very low levels of O₂ (.3%) and high levels of CO₂ (18%).**

What would this indicate to you about the combustion process in this vehicle?

Describe why you reached this conclusion.

3. From the list below identify the system and the components listed from A – C.

EGR Control Valve: Solenoid Valve: Modulator Valve: Exhaust Manifold.



SYSTEM: _____

A: _____

B: _____

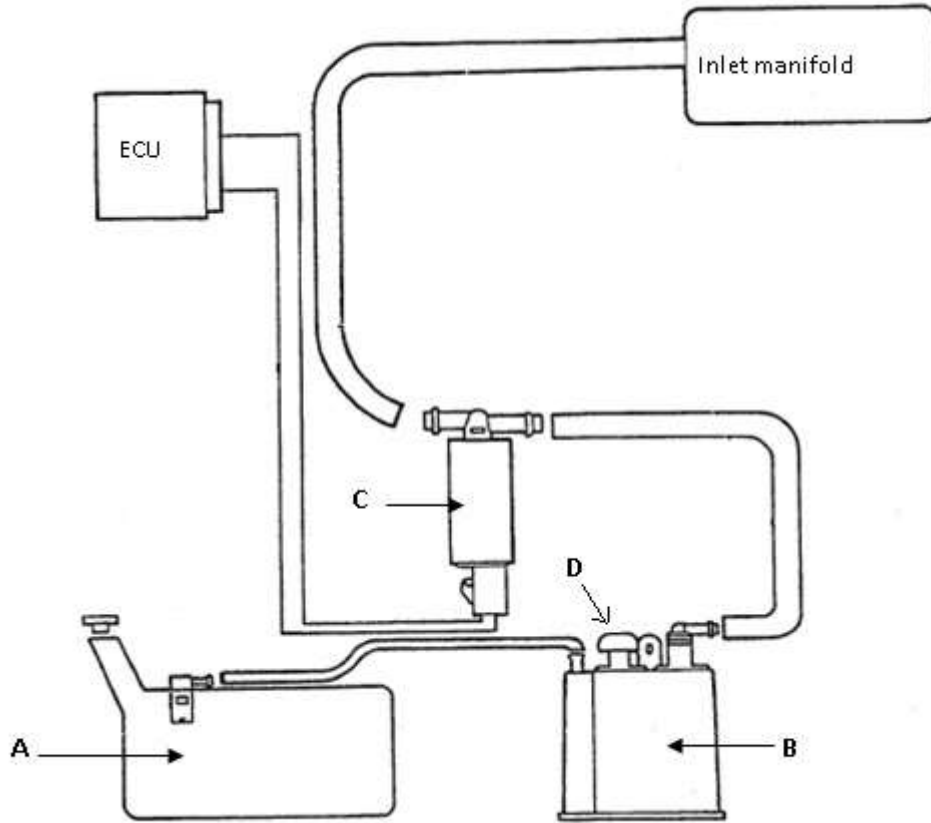
C: _____

D: _____

4. Which gas is the system above targeting and explain how it is reduced.

7. From the list below identify the system and the components listed from A – D.

Charcoal Canister: Atmospheric Port: Purge Control Valve: Fuel Tank.



SYSTEM: _____

A: _____

B: _____

C: _____

D: _____

8. What does the system above do to reduce emissions?

9. Also in the evaporative emission control system; explain how these components reduce emissions.

Roll over valve:

Fuel cap:

10. Match up the EFI fuel components with the most likely location and function.

A	Throttle position sensor		1	Mounted on the throttle body to measure throttle position.
B	Engine temperature sensor		2	Is mounted on the cylinder head or inlet manifold and delivers a metered amount of atomised fuel to the engine.
C	EGR valve		3	Controls release of crankcase gases and vapours into the inlet manifold. Usually located in the rocker cover.
D	ECU		4	Usually mounted in the exhaust manifold or close to it inside the engine pipe, this component measures oxygen content in the exhaust gases.
E	Fuel injector		5	Mounted in the intake ducting and measures intake air volume electronically.
F	Oxygen sensor		6	Mounted on the hottest point of the engine to measure engine temperature.
G	PCV valve		7	Mounted under the vehicle towards the rear and is fitted with an expansion chamber so that it cannot be completely filled to allow for expansion of heated fuel.
H	Air flow meter		8	Designed to recirculate a small amount of exhaust gas back into the inlet manifold during peak temperatures. Usually located on the intake manifold.
I	Fuel tank		9	Receives and interprets information from various sensors to deliver the appropriate amount of fuel and timing of the spark for the engine operating conditions.

- 11. A technician is working on a modern vehicle that has some problems with the emissions control systems. He/she decides to diagnose the actual cause by accessing the diagnostic test codes.**

Describe how the technician should access the diagnostic test codes to help identify the faults.

- 12. The vehicle in question 11 above has now been repaired. The technician must check that the exhaust emissions are within specification. The workshop has a 5 gas exhaust analyser.**

Describe the correct procedure that the technician should use to test the exhaust emissions with the 5 gas analyser.

13. Name four of the gases that are measured by an exhaust gas analyser.

1: _____

2: _____

3: _____

4: _____

14. Name two possible causes of high Hydrocarbon levels (HC).

1 _____

2 _____

15. How would the car's owner benefit from having regular maintenance carried out on the vehicle?

16. Why is regular maintenance of emissions systems important?



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