

QUESTION 1

TRUE OR FALSE CHOICE

This question contains 10 statements which are either true or false. Consider each statement carefully and write your answer to each question whether you consider the statement to be **true** or **false**. **(2 marks each)**

1.1 The **density** of LPG is greater than that of air.

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1.2 **Oxidising Agents** may support combustion.

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1.3 The common name for **Hydrogen Sulphide** is **Prussic Acid**.

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1.4 All **Organic Compounds** contain carbon atoms.

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1.5 **Boyles Law** states that: The volume of a gas is directly proportional to its Kelvin temperature (for a given mass at constant pressure).

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1.6 A gas with a **Molecular Mass** greater than 30 is less dense than air.

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1.7 The **Critical Temperature** of a gas is the temperature above which the gas cannot be liquefied by pressure alone.

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1.8 The **Latent Heat** of vaporisation is the amount of heat required to change one kilogram of solid to its vapour state.

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1.9 **Electrode:** a conducting medium or solution in which the electric current flows by virtue of chemical changes or decomposition.

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1.10 **Watt:** is the amount of energy expended per second by an unvarying current of one ampere under a voltage of one volt.

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QUESTION 2

There are many substances which firefighters encounter on a regular basis. Some are more hazardous than others.

List the uses, properties and hazards associated with the following:

a) Chlorine (Cl_2)

(5 marks)

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b) Ammonia (NH_3)

(5 marks)

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d) Carbon Monoxide (CO)

(5 marks)

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e) Sulphuric Acid (H₂SO₄)

(5 marks)

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QUESTION 3

With the variety of calls now attended by Fire Brigades, a good understanding of the many fire-extinguishing agents is required.

- a) List five of the agents that are readily available for firefighters to use. **(5 marks)**

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- b) Explain how each listed agent extinguishes fire. **(5 marks)**

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c) List the types of substances/fire that water is unsuitable for use on. **(5 marks)**

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d) Why have "Halon" extinguishing agents been withdrawn from use? **(5 marks)**

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QUESTION 4

You are attending a major fire at a plastics factory. To ensure yours and your crew's safety, you must have foundation knowledge in this substance.

- a) Define the two types of plastic and explain the differences. **(5 marks)**

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- b) Detail the hazards and risks to firefighters to be found with burning plastics. **(10 marks)**

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- c) Why is the manufacture of plastics hazardous? **(5 marks)**

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QUESTION 5

A good understanding of thermodynamics is paramount for any well-seeded firefighter.

5.1 Define the following terms: **(2 marks each)**

a) Combustion

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b) Spontaneous Combustion

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c) Auto Ignition Temperature

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d) Exothermic Reaction

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e) Range of Flammability

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f) Boiling Point

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g) Miscibility

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5.2 Name three sources which may cause combustion to start. **(2 marks each)**

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QUESTION 6

6.1 A lever has a pivot point 8m from the pushing end. An effort of 75N is required to lift a load of 300N.

a) Calculate the distance of the pivot to the load. **(5 marks)**

b) Calculate the turning moment of the lever. **(5 marks)**

6.2 A crane is required to lift a weight of 4500N by 35M. It takes 7 seconds to complete this lift.

a) Calculate the amount of work done. **(5 marks)**

b) Calculate the power of the crane. **(5 marks)**