

MATRICULATION AND SECONDARY EDUCATION CERTIFICATE EXAMINATIONS BOARD  
UNIVERSITY OF MALTA, MSIDA

**SECONDARY EDUCATION CERTIFICATE LEVEL**

**MAY 2015**

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<b>SUBJECT:</b>	<b>Engineering Technology</b>
<b>PAPER NUMBER:</b>	Controlled Assessment – Unit 1
<b>DATE:</b>	25 <sup>th</sup> May 2015
<b>TIME:</b>	10:00 a.m. to 12:00 noon

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**THIS PAPER SHOULD BE RETURNED TO THE INVIGILATOR  
AFTER THE EXAMINATION.**

**Name of candidate** \_\_\_\_\_

**I.D. number** \_\_\_\_\_

**School** \_\_\_\_\_

**Class** \_\_\_\_\_

**You must answer ALL the questions contained in this paper.**

**Introduction:**

You have been selected to start working as a Health and Safety Officer within an industrial environment where cars are produced. The company where you will be working also offers maintenance services on the types of cars produced as well as supplies of car parts. Maintenance of company premises is also done in-house, such as woodwork and electrical installations. Such an industrial environment is usually made up of different departments where various engineering activities are carried out in the process before making the final product available on the market. Examples of such activities could be:






- a. Machinery of parts
- b. Woodworking activities for parts packaging;
- c. Woodworking activities for premises furniture requirements;
- d. Manufacturing of electronic circuits;
- e. Organising and managing stores for parts;
- f. Maintenance activities on the company premises;
- g. Maintenance services on cars;
- h. Handling of dangerous chemicals.

As part of your induction programme, before starting to work with the company you are required to attend a five day course about Health and Safety requirements in industry. Before the company can assign you with the job, you are required to sit for a written assessment. This assessment consists of the following questions:

**Question 1: Criterion K-2 (4 marks)**

The warning signs shown below are used to show that a particular substance falls within one of the seven main groups of hazardous substances.

By drawing a line identify the correct danger related to the appropriate warning sign. The first one has been done for you.

	<b>Toxic</b>
	<b>Oxidizing</b>
	<b>Hazardous to the health</b>
	<b>Explosive</b>
	<b>Gas under pressure</b>

**Question 2: Criterion K-6 (4 marks)**

Four major groups in engineering are listed below:

1. Manufacturing and Production
2. Servicing and Maintenance
3. Removal and Installation
4. Inspection and Testing

List **one** engineering activity for every engineering group given above. The first one has been done for you.

Engineering Group	Engineering Activity
Manufacturing and production in industry.	Shaping Plastic using injection moulding machinery.
Removal and installation within the electrical lighting system of the supervisor office.	
Servicing and maintenance on a car engine.	
Production and manufacturing of a storage cabinet for printed car service manuals.	
Inspection and testing the electrical system wiring of a car.	

**Question 3: Criterion K-7 (4 marks)**

Listed below are some engineering activities and a range of Personal Protective Equipment (PPE) that is required to be used.

By completing the table below, relate the major group of PPE to each engineering activity. The first answer is given as an example.

*(Note that some PPE may be related to more than one engineering activity.)*

Range of PPE:

Safety goggles	Temperature resistant gloves	Apron	Face shield
Steel-toe safety shoes	Face mask	Ear plugs	Safety boots with rubber sole
High voltage resistant rubber gloves	Welding Mask	Chemical resistant gloves	Hard Hat
High visibility vest	Flame proof boiler suit	Safety Harness	Cotton/wool clothing

<b>Engineering activity:</b>	<b>Related Group of PPE</b>
Working on high voltage equipment	Safety boots with rubber sole; High voltage resistant rubber gloves; Cotton/wool clothing
Welding two steel flat bars together	
Etching a Printed Circuit Board (PCB)	
Replacing a lamp installed on the ceiling of the factory	
Sanding a piece of Medium Density Fibre-Board (MDF) using a sanding machine	

**Question 4: Criterion C-2 (6 marks)**

For this question you are given a number of containers where particular dangerous substances would typically be packaged or enclosed. For each substance:

- a. Select the correct label.
- b. Select the typical package (container) suitable for the substance.
- c. Describe the importance of labelling the package correctly.

**Containers:**



**Hydrogen Peroxide**



**Acid**



**Liquid Fuel**



**Cleaning Agent**

**Labelling:**



**1.**



**2.**



**3.**



**4.**

*(Sample Answer):*

Type of substance	Associated label	Typical Packaging	Description
<b>Hydrogen Peroxide</b>	<b>3.</b>	Packaged in non-metallic containers (plastic or glass)	May cause or intensify fire. Can cause explosion. Strong oxidiser (can cause corrosion). Keep away from heat/sparks/open flames/hot surfaces. No smoking.

*(Please put your answers in the table given on next Page):*

Type of substance	Associated label	Typical Packaging	Description
<p><b>Acid</b></p>			
<p><b>Liquid Fuel</b></p>			
<p><b>Cleaning Agent</b></p>			

**Question 5: Criterion C-4 (6 marks)**

While doing maintenance work on electrical machinery, one of your colleagues suffered from an electric shock. The following statements describe necessary steps required to help a person suffering from an electric shock. For each statement, state if it is true or false by crossing out the incorrect answer. The first one has been done for you.

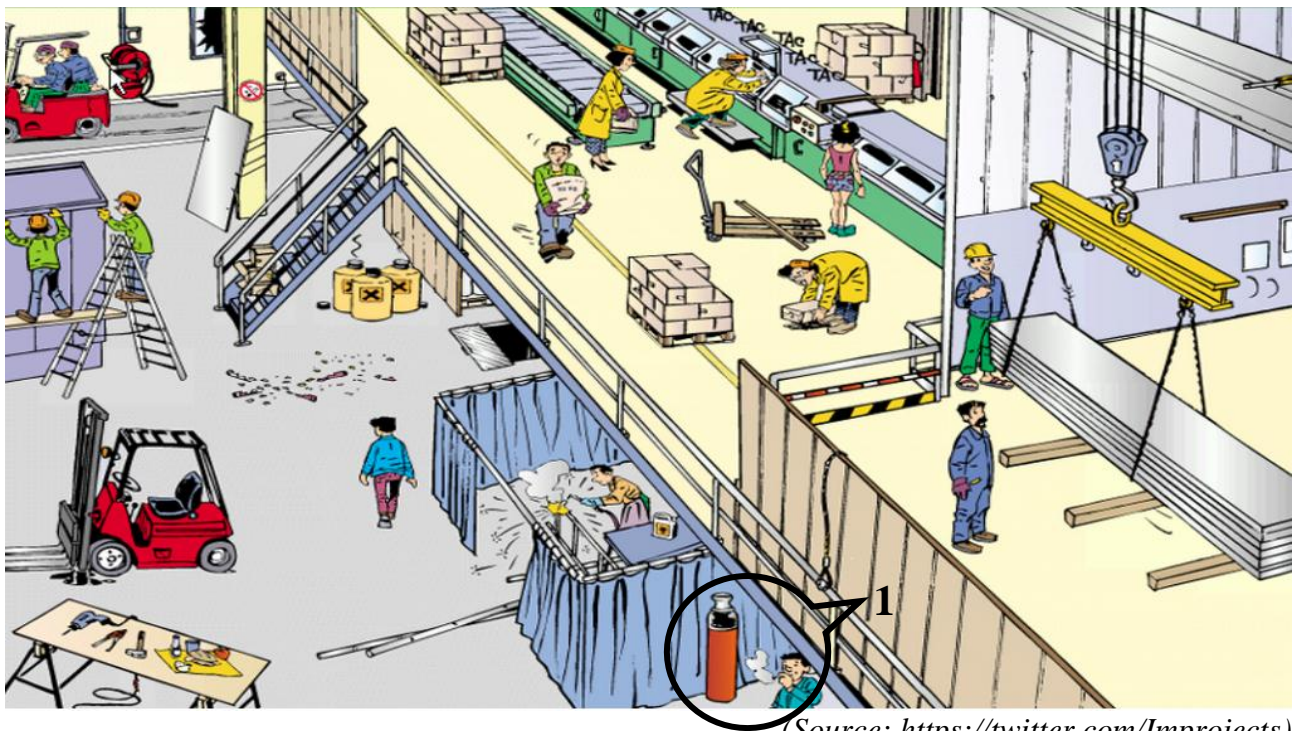
1. The first step to assist a colleague suffering from an electric shock is to isolate the person to a humid and less safe area. (~~True~~/False)
2. One of the important actions you have to take when helping a person suffering from an electric shock is to isolate any bare supply source using a non-conductive object. (True/False)
3. If the person suffering from an electric shock is responding to questions you ask him/her, you should try to administer the Cardio-Pulmonary Resuscitation (C.P.R.). (True/False)
4. Once you have assessed the situation, isolated the electrical hazard and placed the person in a safe situation, you must call professional help by dialling the emergency telephone line 112. (True/False)
5. If a person suffering from an electric shock is breathing normally there is no need for you to place him/her in the recovery position. (True/False)
6. When helping a person suffering from an electric shock you must first assess the responsiveness of the person and then move him/her to a dry and safer location. (True/False)
7. The first action to take when discovering a person who has suffered an electric shock is to assess the situation, and then locate and switch off the main switch of the electrical supply. (True/False)



**Question 6: Criterion C-5 (6 marks)**

The picture given below represents an engineering working environment. A number of situations that could result in a hazard to a technical person are presented. Identify six (6) situations from the picture which could result in a hazard. Complete the table below to explain the hazard/s related to every situation identified.

*(As an example, situation 1 has been identified and the related hazards of risks are explained. You have to complete the table below with other six (6) situations by marking each situation from 2 to 7 in the picture.)*



*(Source: <https://twitter.com/Improjects>)*

Situation No.	Situation type:	Related Hazard/s or Risk/s
1.	Smoking next to a flammable gas container	There is a fire hazard. Since the container is pressurized, there is a risk of explosion. Explosion could cause personal injury.
2.		
3.		
4.		
5.		
6.		
7.		

**Question 7: Criterion A-3 (10 marks)**

In order to ensure safe and effective work in engineering it is very important for everyone to follow, and be in compliance with, current safety legislation. Below are two extracts from the Malta OHSA legislation. Read this legislation and then carry out the following tasks.

**Extract from LEGAL NOTICE 53 of 2012.**

“The scope of these regulations is to lay down minimum requirements for the protection of workers from risks to their health and safety arising, or likely to arise, from the effects of chemical agents that are present at the workplace or as a result of any work activity involving chemical agents.

These regulations apply where hazardous chemical agents are present or may be present at the workplace, and shall be without prejudice to the provisions for chemical agents to which measures for radiation protection apply pursuant to other regulations as may be prescribed.

These regulations shall apply for carcinogens<sup>1</sup> and mutagens<sup>2</sup> at work without prejudice to more stringent and, or specific provisions contained in any other law or regulation on the protection of workers from the risks related to exposure to carcinogens and mutagens.”

1. *‘Carcinogens’ are materials that may cause Cancer.*
2. *‘Mutagens’ are materials that can cause physical or mental disabilities in humans.*

**Extract from LEGAL NOTICE 35 of 2003.**

“It shall be the general duty of an employer to take appropriate organizational measures, or to provide the appropriate means, in particular the mechanical equipment, in order to avoid the need for the manual handling of loads by workers whenever there exists a risk of injury, including injuries to the back, as a result of such operations.

Where the need for the manual handling of loads by workers cannot be avoided, the employer shall take the appropriate organizational measures, use the appropriate means or provide workers with such means in order to reduce the risk involved in the manual handling of such loads, and in so doing, shall give due regard to the contents of Schedule I.”



