



STUDENT SECTION				
Name			Class	
Student MOE number		School MOE Number		STUDENT SIGNATURE
School name				

Creative Design & Innovation

10 & 11 General

Sample - Term 3

Date: May 2017

Time: TBC

Duration: 90 minutes

STUDENT INSTRUCTIONS – For this examination, you must have: 1. An ink pen – blue. 2. A pencil. 3. A ruler.
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TEACHER NOTES & INSTRUCTIONS Please tick ✓ the correct answers in RED INK and then write the mark awarded in the marking columns. With multiple mark answers highlight where the mark is awarded by underlining or by using an extra tick.

FOR ADMIN ONLY	
MARKING RECORD	
Section	Section TOTALS
Section 1	
Section 2	
Section 3	
Section 4	
MARKER SIGNATURE	TOTAL MARKS
MODERATOR SIGNATURE	

SECTION 1 - Multiple choice questions (2 marks each)

Answer the questions below by circling the correct definition.

1 – A(n) _____ collects signals.

A: output

B: processor

C: operation

D: input

2 – _____ provides instructions to operate a computer.

A: Coding

B: A program

C: A sketch

D: A plan

3 – A(n) _____ is a finite signal.

A: continuous signal

B: analog signal

C: digital signal

D: input/output signal

4 – Ambient light comes from _____.

A: an LED

B: natural light

C: a lamp

D: an LCD

5 – A _____ is used to visualize I/O values & information.

A: breadboard

B: microcontroller

C: sensor

D: serial monitor

6 – A _____ controls the flow of gas.

A: gas valve

B: gas pipe

C: electric motor

D: gas monitor

7 – A gas sensor does **NOT** detect _____.

A: Hydrogen

B: Carbon Monoxide

C: Butane

D: Propane

**MARKING
NOTES**

8 – A light source which uses a filament is a(n)_____.

A: electric bulb

B: LED

C: fluorescent lamp

D: neon lamp

9 – A light sensor is a_____.

A: fixed resistor.

B: variable transistor.

C: variable resistor.

D: fixed transistor.

10 – A negative terminal in a component is called a(n)_____.

A: embedded system

B: electric circuit

C: Arduino board

D: cathode

MARKING NOTES

**Section 1
Subtotal**

20

SECTION 2 – True or False (1 mark each)

Circle the correct answer True or False for the following statements.

1 – Radio waves are analog signals.

TRUE

FALSE

2 – A sensor is an output component.

TRUE

FALSE

3 – A battery has no positive or negative.

TRUE

FALSE

4 – A microcontroller acts like a brain.

TRUE

FALSE

5 – An ambient light signal is 0 or 1.

TRUE

FALSE

**Section 2
Subtotal**

5

SECTION 3 – Core content questions.

1 – List **three** products or components that use an analog signal.




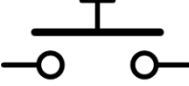

_____ (3 marks)

2 – Describe the sequence of **input – process - output** in a vending machine.

_____ (3 marks)

3 – Match the electronic symbol or component with its name. **(10 marks)**

Write the matching letter in the correct box. The first one has been done for you.

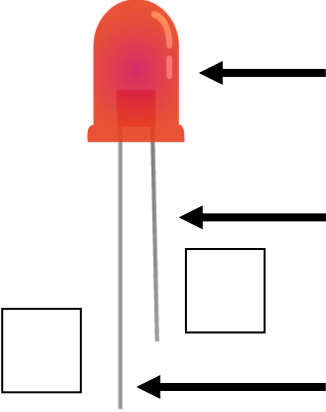
COMPONENT	Symbol letter	SYMBOL	
Voltmeter	F		A
Buzzer			B
Positive			C
Resistor			D
Push button		+	E
Potentiometer			F

4 – Study the image of the LED and symbol below and answer the questions.

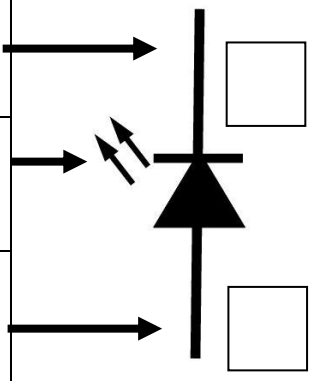
a. Name **each part** of the LED and the symbol shown below. **(6 marks)**

b. Write which legs on the LED image are **+ & -** **(2 marks)**

c. **Draw** + and – on the LED symbol to show direction of current. **(2 marks)**



LED image



LED symbol

5 – Complete the sentences below using **one** word. Do not use the same word for more than one answer. **Two** words will **NOT** be used. (8 marks)

variable	module
microcontroller	potentiometer
finite	buzzer
delay()	void
light	signal

- a. The rotational sensor component is called a _____.
- b. A _____ is an output device.
- c. A way of naming and storing value for later use in a program is called a _____.
- d. Screen brightness for mobile phones uses the _____ sensor.
- e. The _____ command tells the board to do nothing for a specific time.
- f. An electric motor receives a _____ from the microcontroller.
- g. A digital signal has a _____ set of possible values.
- h. A _____ contains all the units required for an external system.

6 – List **three** shapes used in a flowchart.

(3 marks)

7 – List **three** electronic components found in an electric light circuit.

(3 marks)

MARKING NOTES

**Section 3
Subtotal**

<hr/> 40

SECTION 4

1 – Draw a flowchart for a buzzer ON and OFF using a pushbutton as input.

(10 marks)

2 – List three alternative outputs for the flowchart above. **(3 marks)**

3 – List two reasons for drawing a flowchart. **(2 marks)**

**MARKING
NOTES**

**MARKING
NOTES**

```
Line 1 void loop()
Line 2 {
Line 3   pinMode(13, OUTPUT); // set pin 13 as an output (LED)
Line 4   pinMode(8, OUTPUT); // set pin 13 as an output (buzzer)
Line 5 }
Line 6 void loop[ ]
Line 7 {
Line 8   Int gasSensor==analogRead(0); //read analog signal of the gas sensor
Line 9   if gasSensor >200 //checking if there is gas detected or not
Line 10  {
Line 11     // the LED and buzzer are ON for 1 second
Line 12     digitalWrite(13,HIGH);
Line 13     digitalWrite(8,HIGH);
Line 14     delay(1000);
Line 15     // the LED and buzzer are OFF for 1 second
Line 16     digitalWrite(13,LOW);
Line 17     digitalWrite(8,LOW);
Line 18     delay(1);
Line 19  }
Line 20 else
Line 21  {
Line 22     // the LED and buzzer are OFF
Line 23     digitalWrite(13,LOW);
Line 24     digitalWrite(8,LOW);
Line 25  }
Line 26 }
```

4 - Find the errors in the code lines. Write the errors below. **(8 marks)**

Example in Line 18 – **ERROR** is delay(1);

Line _____

Line _____

Line _____

Line _____

5 – Write below correct codes for the errors you found for question 4. **(8 marks)**

Example in Line 18 – **CORRECT** is delay(1000);

Line _____

Line _____

Line _____

Line _____

6 - Rewrite the delay command in Line 14 and 18 as follows: **(4 marks)**

a. Keep the LED and buzzer ON for 0.5 second -

b. Keep the LED and buzzer OFF for 2 second -

Section 4

Subtotal

35

**EXAM
TOTAL**

100

You have now finished the examination.