



**L-Università
ta' Malta**

MATRICULATION AND SECONDARY EDUCATION CERTIFICATE
EXAMINATIONS BOARD

**SECONDARY EDUCATION CERTIFICATE LEVEL
2021 MAIN SESSION**

SUBJECT:	Engineering Technology
PAPER NUMBER:	Controlled – Unit 3
DATE:	20 th May 2021
TIME:	10:00 a.m. to 11:35 a.m.

Name of candidate _____

I.D. number _____

School _____

Class _____

Answer **ALL** questions in the space provided.
 The use of non-programmable electronic calculators is allowed.

Scenario

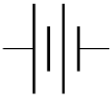



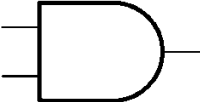
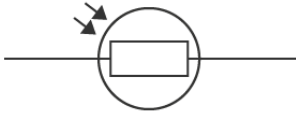


- A company which manufactures electronics for cars would like to employ an electronics technician.
- Answer all the questions to demonstrate that you are a suitable candidate for this post.






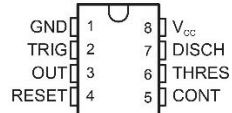


Question 1

K-1 (4 marks)

Identify the component corresponding to the schematic, pictorial or real-life representation provided in Table 1.

Table 1 – Representations of electronic components.

	Representations	Component name
(a)	 (Source: https://www.electronicshub.org/symbols/)	_____
(b)	 (Source: https://www.electronicshub.org/symbols/)	_____
(c)	 (Source: https://www.ebay.ie/itm)	_____
(d)	 (Source: www.amazon.com)	_____
(e)	 (Source: https://www.electronicshub.org/symbols/)	_____
(f)	 (Source: https://www.electronicshub.org/symbols/)	_____
(g)	 (Source: https://www.electronicshub.org/symbols/)	_____
(h)	 (Source: https://www.switchelectronics.co.uk)	_____

(i)	 <p>(Source: https://www.sparkfun.com)</p>	
(j)	 <p>(Source: https://www.electrical-symbols.com/)</p>	
(k)	 <p>(Source: www.amazon.com)</p>	
(l)	 <p>(Source: www.amazon.com)</p>	
(m)	 <p>(Source: www.amazon.com)</p>	
(n)	 <p>(Source: https://www.electronicshub.org)</p>	
(o)	 <p>(Source: www.amazon.com)</p>	
(p)	 <p>(Source: www.amazon.com)</p>	

(4)

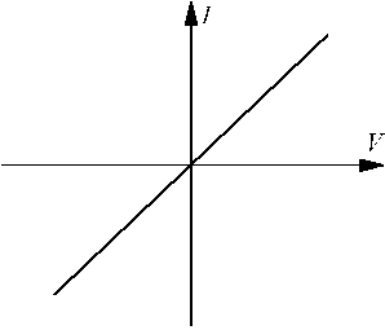
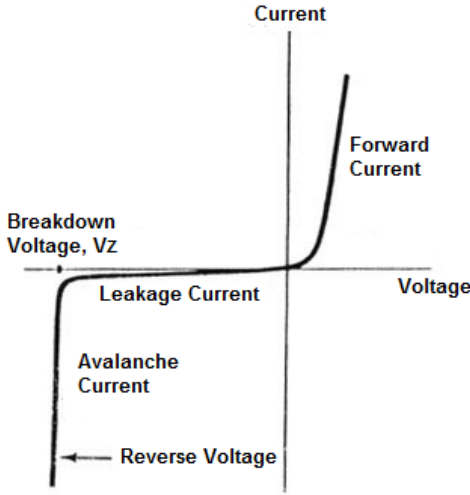
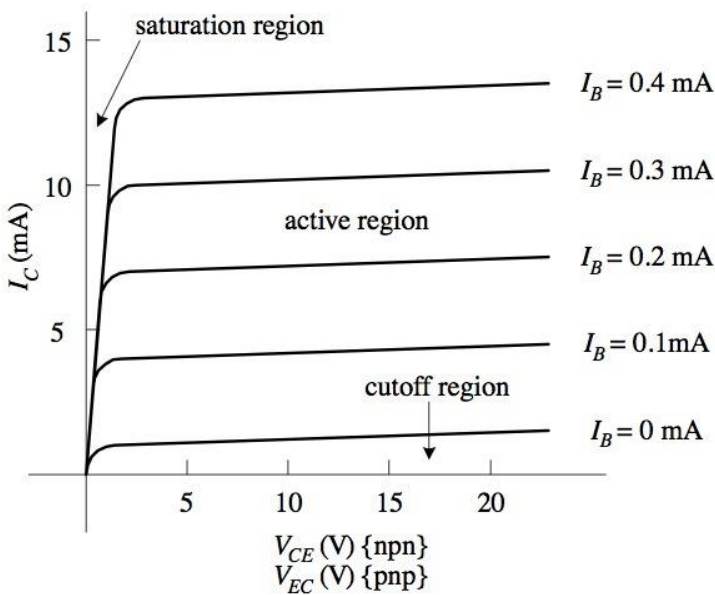
Please turn the page.

Question 2

C-2 (6 marks)

- (a) Refer to the characteristic curves in Table 2 and answer the following questions. Name the components that correspond to the current-voltage characteristic curves 2 and 3 given in Table 2.

Table 2 – Characteristic curves of various electronic components.

	Characteristic Curves (Current I/Voltage V)	Component name
Curve 1	 <p>(Source: https://www.miniphysics.com/iv-characteristic-graphs.html)</p>	Resistor
Curve 2	 <p>(Source: www.learningaboutelectronics.com)</p>	(0.5)
Curve 3	 <p>(Source: https://www.electronics-tutorials.ws/)</p>	(0.5)

(b) Refer to the characteristic curve 1 and describe the relationship between current and voltage.

(1)

(c) Refer to the characteristic curve 2 and answer the questions below.

(i) Describe how the component is connected in the forward region of the characteristic curve.

(1)

(ii) Describe the relationship between voltage and current in the forward region.

(1)

This question continues on next page.




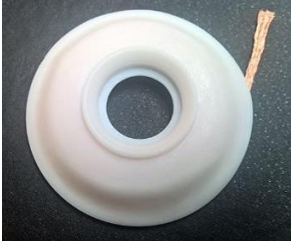



(d) Refer to the characteristic curve 3 and explain what happens in the following regions:

(i) Saturation Region

(1)

(ii) Active Region

(1)

(b)	 <p>(Source: https://mt.rsdelivers.com/product/rs-pro)</p>	<hr/> <hr/>
(c)	 <p>(Source: https://mt.rsdelivers.com/)</p>	<hr/> <hr/>
(d)	 <p>(Source: https://www.amazon.com/)</p>	<hr/> <hr/>
(e)	 <p>(Source: https://www.amazon.co.uk/)</p>	<hr/> <hr/>
(f)	 <p>(Source: https://www.autofactorswaterford.ie/product/)</p>	<hr/> <hr/>
(g)	 <p>(Source: https://www.banzaimusic.com/)</p>	<hr/> <hr/>
(h)	 <p>(Source: https://www.esr.co.uk/shop/contents/en-uk/)</p>	<hr/> <hr/>

Please turn the page.

Question 5

C-5 (6 marks)

Electronic circuit boards are commonly used because they mechanically support and electrically connect circuit components. There are various electronic boards, each with its appropriate advantages and disadvantages.

Fill Table 4 below, by identifying **ONE** advantage and **ONE** disadvantage for each of the following electronic boards.

Table 4 – Advantages and Disadvantages of electronic boards.

	Electronic Board	Advantage	Disadvantage
(a)	Breadboard	<hr/> <hr/> <hr/> <hr/> <hr/> <div style="text-align: right;">(1)</div>	<hr/> <hr/> <hr/> <hr/> <hr/> <div style="text-align: right;">(1)</div>
(b)	Strip board	<hr/> <hr/> <hr/> <hr/> <hr/> <div style="text-align: right;">(1)</div>	<hr/> <hr/> <hr/> <hr/> <hr/> <div style="text-align: right;">(1)</div>
(c)	PCB	<hr/> <hr/> <hr/> <hr/> <hr/> <div style="text-align: right;">(1)</div>	<hr/> <hr/> <hr/> <hr/> <hr/> <div style="text-align: right;">(1)</div>