

GCE AS/A LEVEL



# WJEC GCE AS/A Level in DIGITAL TECHNOLOGY

APPROVED BY QUALIFICATIONS WALES

## SAMPLE ASSESSMENT MATERIALS - UNIT 1

Teaching from 2022

AS award from 2023  
A level award from 2024

This Qualifications Wales regulated qualification is not available to centres in England.

A close-up, angled view of a laptop keyboard, rendered in a dark blue color that matches the background. The keys are visible, and the laptop is open.



For teaching from 2022  
For AS award from 2023  
For A level award from 2024

GCE AS and A LEVEL in  
DIGITAL TECHNOLOGY

SAMPLE ASSESSMENT  
MATERIALS

UNIT 1

# Contents

	Page
<b>Examinations</b>	
UNIT 1: Innovation in Digital Technology	
Question paper	3
Mark scheme	16

Candidate Name	Centre Number					Candidate Number				



**GCE AS and A LEVEL  
DIGITAL TECHNOLOGY**

**UNIT 1**

**Innovation in Digital Technology  
SAMPLE ASSESSMENT MATERIALS**

**2 hours**

**These sample assessment materials, including the mark scheme, are shown in paper-based form.**

**The live assessments will be provided onscreen only, in compliance with section 16 in the subject-approval criteria for GCE Digital Technology.**

**INSTRUCTIONS TO CANDIDATES**

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

You may use a pencil for graphs and diagrams only.

Answer **all** questions.

Write your name, centre number and candidate number in the spaces provided at the top of this page.

Write your answers in the spaces provided in this booklet. If you run out of space, use the additional page(s) at the back of the booklet, taking care to number the question(s) correctly.

**INFORMATION FOR CANDIDATES**

The number of marks is given in brackets at the end of each question or part question. You are advised to divide your time accordingly.

The total number of marks available is 80.

You are reminded of the need for good English and orderly, clear presentation in your answers. The quality of your written communication (QWC), including appropriate use of punctuation and grammar, will be assessed in your answer to question **10**.

Answer **all** questions.

1. Amy is keen to set up a home office with Wi-Fi internet access so that she can work from home anywhere in her house.

(a) State the protocol used for Wi-Fi connection. [1]

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(b) (i) Name **two** items of hardware that Amy will need so that her computer will wirelessly connect to the Internet. [2]

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(ii) Explain why **one** item of hardware you have named in (b)(i) is required. [3]

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- (c) Amy's employer often sends her media files that are several terabytes. Therefore Amy has been advised that she should install a fibre connection to her home.

Recommend which type of fibre connection would be most appropriate for Amy to install. [4]

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2. User-Centred Design (UCD) is a philosophy primarily used in interface design.

Identify the phases of the User-Centred Design (UCD) process. [4]

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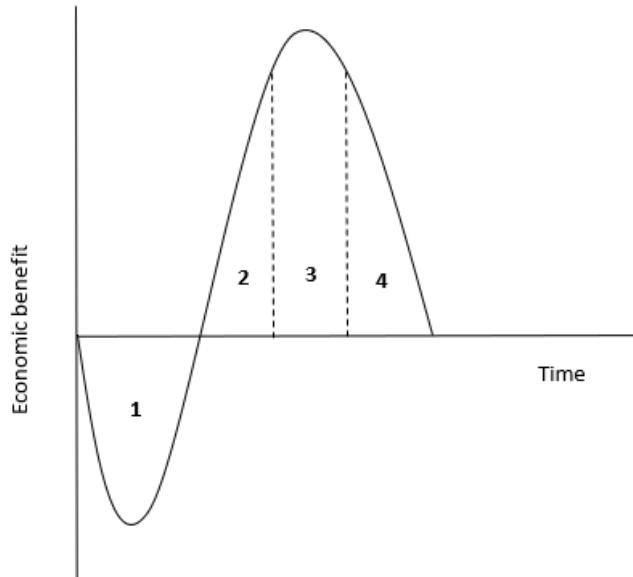
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3. The digital technology development life cycle can be described in terms of the S-curve model, which plots economic benefit against time, as shown below.



- (a) Identify the stages labelled 1-4 in the diagram. [4]

Stage	Name
1	
2	
3	
4	

- (b) For each stage, outline the trend shown by the curve in terms of the economic benefit to an organisation. [4]

Stage 1: .....

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Stage 2: .....

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Stage 3: .....

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Stage 4: .....

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4. (a) 'People to People' is one of the three main interactions within the Internet of Everything (IoE).

Name and describe **one** other interaction within the IoE. [3]

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- (b) Devices often require maintenance and updates.

- (i) Explain which type of maintenance would be required to enable a smart speaker to play a new type of sound file. [3]

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5. (a) Define the term Artificial Intelligence. [2]

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- (b) Describe **two** differences between Artificial Narrow Intelligence and Artificial General Intelligence. [4]

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## MARK SCHEME

### Guidance for examiners

#### Positive marking

It should be remembered that candidates are writing under examination conditions and credit should be given for what the candidate writes, rather than adopting the approach of penalising him/her for any omissions. It should be possible for a very good response to achieve full marks and a very poor one to achieve zero marks. Marks should not be deducted for a less than perfect answer if it satisfies the criteria of the mark scheme.

For questions that are objective or points-based, the mark scheme should be applied precisely. Marks should be awarded as indicated and no further subdivision made.

Mark schemes often list points which may be included in candidates' answers. The list is not exhaustive. *The inclusion of 'Credit any other valid response.'* (or similar instruction) within mark schemes allows for the possible variation in candidates' responses. Credit should be given according to the accuracy and relevance of candidates' answers.

Appropriate terminology is reflected in exemplar responses in mark schemes. However, unless there is a specific requirement within a question, candidates may be awarded marks where the answer is accurate but expressed in their own words.

#### Banded mark schemes

For band marked questions, mark schemes are in two parts, the indicative content and the assessment grid.

The indicative content suggests the range of points and issues which may be included in candidates' answers. It can be used to assess the quality of the candidate's response. As noted above, indicative content is not intended to be exhaustive and candidates do not have to include all the indicative content to reach the highest level of the mark scheme.

However, in order to reach the highest level of the mark scheme a candidate must meet the requirements of the highest mark band. Where a response is not creditworthy, that is, it contains nothing of any significance to the mark scheme, or where no response has been provided, no marks should be awarded.

Candidates' responses to questions are assessed against the relevant assessment objectives. In GCE Digital Technology Unit 1, each question will address one assessment objective.

The marking of banded mark questions should always be positive. This means that, for each candidate's response, marks are accumulated for the demonstration of relevant skills, knowledge and understanding: they are not deducted from a maximum on the basis of errors or omissions.

Examiners should first read and annotate the candidate's answer to pick out the evidence that is being assessed in that question. The mark scheme can then be applied. This is done as a two stage process.

### **Stage 1 – Deciding on the band**

Beginning at the lowest band, examiners should look at the candidate's answer and check whether it matches the descriptors for that band. If the descriptors at the lowest band are satisfied, examiners should move up to the next band and repeat this process for each band until the descriptors match the answer.

If an answer covers different aspects of different bands within the mark scheme, a 'best fit' approach should be adopted to decide on the band and then the candidate's response should be used to decide on the mark within the band. For instance, if a response is mainly in band 2 but with a limited amount of band 3 content, the answer would be placed in band 2, but the mark awarded would be close to the top of band 2 as a result of the band 3 content.

Examiners should not seek to mark candidates down as a result of small omissions in minor areas of an answer.

### **Stage 2 – Deciding on the mark**

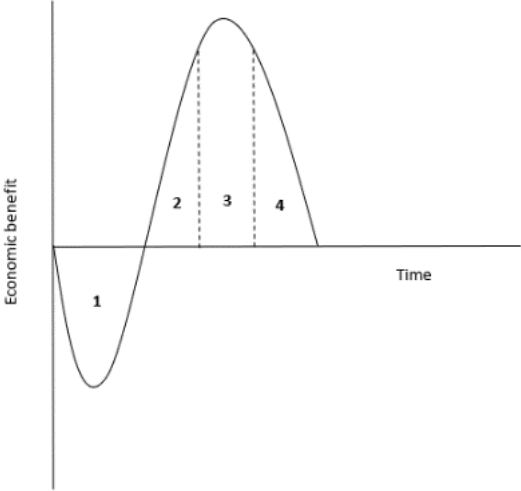
During standardising (the marking conference), detailed advice from the Principal Examiner on the qualities of each mark band will be given. Examiners will then receive examples of answers in each mark band that have been awarded a mark by the Principal Examiner. Examiners should mark the examples and compare their marks with those of the Principal Examiner.

When marking, examiners can use these examples to decide whether a candidate's response is of a superior, inferior or comparable standard to the example. Examiners are reminded of the need to revisit the answer as they apply the mark scheme in order to confirm that the band and the mark allocated is appropriate to the response provided.

Question		Answer	AO1	AO2	Total Mark
1.	<i>Amy is keen to set up a home office with Wi-Fi internet access so that she can work from home anywhere in her house.</i>				
	(a)	<i>State the protocol used for Wi-Fi connection.</i>	1		1
		Award <b>one</b> mark for a identifying the protocol: <ul style="list-style-type: none"> <li>802.11</li> </ul>			
	(b)	(i) <i>Name <b>two</b> items of hardware that Amy will need so that her computer will wirelessly connect to the Internet.</i>	2		2
		Award <b>one</b> mark for identifying each device: <ul style="list-style-type: none"> <li>wireless router</li> <li>wireless network interface card/Wireless NIC (or device with wireless NIC).</li> </ul> Credit any other valid response.	1 1		
		(ii) <i>Explain why <b>one</b> item of hardware you have named in (b)(i) is required.</i>		3	3
		Award <b>one</b> mark for a basic explanation of why one item of hardware is required, for example: <ul style="list-style-type: none"> <li>Amy's computer will connect using the router's Wi-Fi</li> <li>The NIC connects the computer to the Wi-Fi.</li> </ul> Award <b>two</b> marks for a more developed explanation of why one item of hardware is required, for example: <ul style="list-style-type: none"> <li>The router provides the gateway to the Internet and the Wi-Fi that Amy's computer and other devices connect to</li> <li>The NIC transmits and receives the data that Amy's computer sends on the Wi-Fi network.</li> </ul> Award <b>three</b> marks for a fully developed explanation of why one item of hardware is required, for example: <ul style="list-style-type: none"> <li>The router provides the Wi-Fi that Amy's computer connects to and deals with address translation so that data is sent back to the correct device</li> <li>The NIC analyses broadcast data packets and only accepts ones sent to its address on the Wi-Fi network.</li> </ul> Credit any other valid response.			

Question	Answer	AO1	AO2	Total Mark
(c)	<p><i>Amy's employer often sends her media files that are several terabytes. Therefore Amy has been advised that she should install a fibre connection to her home.</i></p> <p><i>Recommend which type of fibre connection would be most appropriate for Amy to install.</i></p>		4	4
	<p>Award <b>one</b> mark for a limited recommendation, for example:</p> <ul style="list-style-type: none"> <li>• FTTP would be best.</li> </ul> <p>Award <b>two</b> marks for a basic recommendation, for example:</p> <ul style="list-style-type: none"> <li>• FTTP would be better than FTTC as it has a larger bandwidth available to it.</li> </ul> <p>Award <b>three</b> marks for a more developed recommendation, for example:</p> <ul style="list-style-type: none"> <li>• FTTP would deliver a fibre connection to her house. This would give a better capacity than FTTC which delivers to a cabinet nearby with the 'last mile' delivered by copper.</li> </ul> <p>Award <b>four</b> marks for a fully developed recommendation, for example:</p> <ul style="list-style-type: none"> <li>• FTTP would give the best capacity as it is unconstrained. An FTTC connection would go to a cabinet nearby with the distance between the cabinet and the house being copper. The bandwidth is shared by everyone connected to the cabinet.</li> </ul> <p>Credit any other valid response.</p>			

Question	Answer	AO1	AO2	Total Mark
2.	<p><i>User-Centred Design (UCD) is a philosophy primarily used in interface design.</i></p> <p><i>Identify the phases of the User-Centred Design (UCD) process.</i></p>	4		4
	<p>Award <b>one</b> mark for each phase:</p> <ul style="list-style-type: none"> <li>• specifying the context of use</li> <li>• specifying requirements</li> <li>• creating design solutions</li> <li>• evaluating designs.</li> </ul> <p>Credit any other valid response.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>		

Question	Answer	AO1	AO2	Total Mark										
3.	<p>The digital technology development life cycle can be described in terms of the S-curve model, which plots economic benefit against time, as shown below.</p> 													
(a)	Identify the stages labelled 1-4 in the diagram.	4		4										
	<p>Award <b>one</b> mark for each correct identification:</p> <table border="1"> <thead> <tr> <th>Stage</th> <th>Name</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Research and Development (R&amp;D)</td> </tr> <tr> <td>2</td> <td>Ascent</td> </tr> <tr> <td>3</td> <td>Maturity</td> </tr> <tr> <td>4</td> <td>Decline</td> </tr> </tbody> </table>	Stage	Name	1	Research and Development (R&D)	2	Ascent	3	Maturity	4	Decline	1 1 1 1		
Stage	Name													
1	Research and Development (R&D)													
2	Ascent													
3	Maturity													
4	Decline													

Question		Answer	AO1	AO2	Total Mark
	(b)	<i>For each stage, outline the trend shown by the curve in terms of the economic benefit to an organisation.</i>	4		4
		<p>Award <b>one</b> mark for each stage :</p> <p>Stage 1</p> <ul style="list-style-type: none"> <li>no income received from input and organisation has negative economic benefit (loses money)</li> </ul> <p>Stage 2</p> <ul style="list-style-type: none"> <li>as customers become aware of the product, it gains in popularity, monetary yield is returned as sales increase</li> </ul> <p>Stage 3</p> <ul style="list-style-type: none"> <li>product is widely adopted by customers with maximum financial gain as sales peak</li> </ul> <p>Stage 4</p> <ul style="list-style-type: none"> <li>product is superseded, sales and financial gain decrease as customers migrate to new products.</li> </ul> <p>Credit any other valid response.</p>	1		
			1		
			1		
			1		

Question		Answer	AO1	AO2	Total Mark
4.	(a)	<p><i>'People to People' is one of the three main interactions within the Internet of Everything (IoE).</i></p> <p><i>Name and describe <b>one</b> other interaction within the IoE.</i></p>	3		3
		<p>Candidates will be awarded one mark for naming of an interaction, two marks for a basic description and three marks for a more developed description.</p> <p>Award <b>one</b> mark for naming the interaction:</p> <ul style="list-style-type: none"> <li>• Machine to Machine (M2M)</li> <li>• Machine to People (M2P).</li> </ul> <p>Award <b>two</b> marks for a basic description, for example:</p> <ul style="list-style-type: none"> <li>• Machine to Machine (M2M) is direct communication between devices</li> <li>• Machine to People (M2P) is where information is transferred between a device and a person.</li> </ul> <p>Award <b>three</b> marks for a more developed description, for example:</p> <ul style="list-style-type: none"> <li>• Machine to Machine (M2M) is direct communication between devices; sensor data is transmitted between devices and a program helps interpret and make decisions</li> <li>• Machine to People (M2P) is where information is transferred between a device and a person to help the person make a decision; the action the person then takes forms a feedback loop.</li> </ul> <p>Credit any other valid response.</p>			

Question		Answer	AO1	AO2	Total Mark
	(b)	<i>Devices often require maintenance and updates.</i>			
	(i)	<i>Explain which type of maintenance would be required to enable a smart speaker to play a new type of sound file.</i>		3	3
		<p>Award <b>one</b> mark for an appropriate method, <b>two</b> marks for a basic explanation and <b>three</b> marks for a detailed explanation.</p> <p>Award <b>one</b> mark for the naming of a method with no further explanation, for example:</p> <ul style="list-style-type: none"> <li>Adaptive maintenance.</li> </ul> <p>Award <b>two</b> marks for a basic explanation of a method, for example:</p> <ul style="list-style-type: none"> <li>Adaptive maintenance because it's keeping the software current.</li> </ul> <p>Award <b>three</b> marks for a detailed explanation of a method, for example:</p> <ul style="list-style-type: none"> <li>Adaptive maintenance keeps a software system up to date without changing any features. Adding a new file type falls under this rather than perfective maintenance.</li> </ul> <p>Credit any other valid response.</p>			
	(ii)	<i>A threat has been discovered that could render a smart speaker inoperative.</i>		6	6
		<p><b>Indicative content</b> Answers may refer to the following:</p> <ul style="list-style-type: none"> <li>Advantages: <ul style="list-style-type: none"> <li>Preventive maintenance (PM) refers to software updates that prepare a device for changes</li> <li>PM will prevent the speaker from becoming inoperable</li> <li>Performing PM is better than the consequences of not doing so (e.g. having to buy a new smart speaker).</li> </ul> </li> </ul>			

Question		Answer	AO1	AO2	Total Mark
		<ul style="list-style-type: none"> <li>• Disadvantages:               <ul style="list-style-type: none"> <li>• PM can take a while to be loaded</li> <li>• PM for a smart speaker will stop it working for a short while during the update</li> <li>• PM may have unintended consequences in terms of functionality i.e. removing some functions that used to work</li> <li>• Apps on the speaker may no longer work as intended and may themselves have to be updated.</li> </ul> </li> </ul> <p>Credit any other valid response.</p>			

Band	AO2
	<b>5-6 marks</b>
<b>3</b>	<p>A very good discussion, which shows:</p> <ul style="list-style-type: none"> <li>• thorough knowledge and understanding of preventive maintenance</li> <li>• a confident grasp of the advantages and disadvantages of preventive maintenance in the context of a smart speaker.</li> </ul>
	<b>3-4 marks</b>
<b>2</b>	<p>A good discussion, which shows:</p> <ul style="list-style-type: none"> <li>• generally secure knowledge and understanding preventative maintenance</li> <li>• a generally secure grasp of preventive maintenance of the advantages and disadvantages of preventive maintenance in the context of a smart speaker.</li> </ul>
	<b>1-2 marks</b>
<b>1</b>	<p>A basic discussion, which shows:</p> <ul style="list-style-type: none"> <li>• some knowledge and understanding of the basic concepts of preventative maintenance</li> <li>• some grasp of the advantages and disadvantages of preventive maintenance in the context of a smart speaker.</li> </ul>
	<b>0 marks</b>
	Response not creditworthy or not attempted.

Question		Answer	AO1	AO2	Total Mark
5.	(a)	<i>Define the term Artificial Intelligence.</i>	2		2
		<p>Award <b>one</b> mark for a basic definition, for example:</p> <ul style="list-style-type: none"> <li>The simulation of intelligent behaviour by a computer.</li> </ul> <p>Award <b>two</b> marks for a more developed definition, for example:</p> <ul style="list-style-type: none"> <li>The simulation of intelligent behaviour by a computer which enables it to make decisions without human intervention (or enables it to perform tasks normally requiring human intelligence).</li> </ul> <p>Credit any other valid response.</p>			
	(b)	<i>Describe two differences between Artificial Narrow Intelligence and Artificial General Intelligence.</i>	4		4
		<p>Award <b>one</b> mark for a basic description for each difference, for example:</p> <ul style="list-style-type: none"> <li>Artificial Narrow Intelligence (ANI) can perform a single task</li> <li>Artificial General Intelligence (AGI) can perform a range of different tasks</li> <li>ANI performs tasks extremely quickly</li> <li>AGI mirrors human intelligence through autonomous learning.</li> </ul> <p>Award <b>two</b> marks for a more developed description for each difference, for example:</p> <ul style="list-style-type: none"> <li>Artificial Narrow Intelligence (ANI) relates to a computer's ability to perform a single task or narrow range of tasks, while Artificial General Intelligence (AGI) relates to a computer's ability to apply knowledge and skills in a range of different contexts</li> <li>ANI performs single tasks extremely quickly/extremely precisely, while AGI mirrors human intelligence through autonomous learning and/or problem solving.</li> </ul> <p>NB: candidates must describe <b>two</b> differences for full marks.</p> <p>Credit any other valid response.</p>			

Question	Answer	AO1	AO2	Total Mark
6.	<i>A game developer has designed a chat bot that she hopes to use with in-game characters.</i>			
	<i>Recommend an appropriate test that would allow the developer to assess the suitability of a chat bot to 'talk' to in-game characters. Your recommendation should show how the test would operate and the criteria needed to decide if the test had been passed.</i>		6	6
	<p><b>Indicative content</b> The only appropriate test identified in the specification is the Turing test.</p> <p>Answers may refer to the following:</p> <ul style="list-style-type: none"> <li>• The test <ul style="list-style-type: none"> <li>• involves two humans, one as an evaluator and one as a participant, and the chatbot</li> <li>• the evaluator has to decide, on the basis of responses received, which one is the human and which one is the chatbot.</li> </ul> </li> <li>• Operation <ul style="list-style-type: none"> <li>• the evaluator would be in a separate location from the other human</li> <li>• the evaluator would have a conversation with both the human and the chatbot via a text-based channel</li> <li>• the evaluator is aware that one of the two partners in the conversation is the chatbot and has to judge which one it is.</li> </ul> </li> <li>• Criteria <ul style="list-style-type: none"> <li>• the test would be deemed as passed should the evaluator not be able to tell the machine from the human</li> <li>• if the evaluator is able to distinguish the human from the chatbot, the test would be deemed as failed.</li> </ul> </li> </ul> <p>Credit any other valid response.</p>			

Band	AO2
3	<p><b>5-6 marks</b></p> <p>A very good recommendation, which shows:</p> <ul style="list-style-type: none"> <li>thorough knowledge and understanding of an appropriate test</li> <li>a confident grasp of the criteria needed to decide if the test has been passed.</li> </ul>
2	<p><b>3-4 marks</b></p> <p>A good recommendation, which shows:</p> <ul style="list-style-type: none"> <li>generally secure knowledge and understanding of an appropriate test</li> <li>a generally secure grasp of the criteria needed to decide if the test has been passed.</li> </ul>
1	<p><b>1-2 marks</b></p> <p>A basic recommendation, which shows:</p> <ul style="list-style-type: none"> <li>some knowledge and understanding of an appropriate test</li> <li>some grasp of the criteria needed to decide if the test has been passed.</li> </ul>
	<p><b>0 marks</b></p> <p>Response not creditworthy or not attempted.</p>

Question	Answer	AO1	AO2	Total Mark
7.	<p><i>One of the health issues associated with virtual reality (VR) devices is cybersickness.</i></p> <p><i>Outline four ways a user can reduce cybersickness when using VR headsets.</i></p>	4		4
	<p>Award <b>one</b> mark for each method of reducing cybersickness, up to a maximum of <b>four</b> marks:</p> <ul style="list-style-type: none"> <li>acclimatisation – beginning with short sessions of use and gradually increasing over time</li> <li>setting software to ‘comfort mode’ which limits camera and in software motion</li> <li>using VR equipment and software with minimal lag between motion in real life and reactive game motion</li> <li>using VR headset in a seated position rather than standing</li> <li>taking frequent breaks while using the device</li> <li>installing static frame of reference software that provides a static point that can be focused upon in the game/software</li> <li>ensure the headset is fitted properly so that the lenses align properly with the eyes</li> <li>use a fan or opening a window to increase air movement</li> <li>use anti-nausea technology, such as a wristband.</li> </ul> <p>Credit any other valid response.</p>			

Question	Answer	AO1	AO2	Total Mark
8.	<i>Social media is an integral part of many people's lives and has many functions.</i>			
(a)	<i>Describe <b>three</b> functions of social media.</i>	6		6
	<p>Candidates may refer to the following functions of social media:</p> <ul style="list-style-type: none"> <li>• Profile setting <ul style="list-style-type: none"> <li>• allows users to create a small biography about themselves</li> <li>• allows information about a user to be collated</li> </ul> </li> <li>• Status/wall posts <ul style="list-style-type: none"> <li>• allows users to post and share content on their profile</li> <li>• allows other users to receive information about their friends</li> <li>• allows interaction with other users.</li> </ul> </li> <li>• Uploading media <ul style="list-style-type: none"> <li>• adding video, audio, images, text or other media</li> <li>• media can be tagged</li> <li>• media can be streamed.</li> </ul> </li> <li>• Messaging <ul style="list-style-type: none"> <li>• sending individual messages to other users</li> <li>• can be used for group messages</li> <li>• messages from individuals may be blocked.</li> </ul> </li> <li>• Notifications <ul style="list-style-type: none"> <li>• indicate that an event has occurred</li> <li>• can be a message, post or update</li> <li>• combines commonly with banner, red dot, sound or haptic feedback.</li> </ul> </li> <li>• Newsfeeds <ul style="list-style-type: none"> <li>• the main system through which users are delivered content</li> <li>• can include friend requests, profile changes, events and birthdays</li> <li>• can be customised to user preference.</li> </ul> </li> <li>• Comments/reactions <ul style="list-style-type: none"> <li>• comments give a text/graphic/video/audio response to a post</li> <li>• reactions include a variety of emoji that may be used to signify feelings about a post</li> <li>• can be customised or added to on some platforms.</li> </ul> </li> </ul>			

Question	Answer	AO1	AO2	Total Mark
	<ul style="list-style-type: none"> <li>• Sharing                             <ul style="list-style-type: none"> <li>• to share a post from one friend or other entity with other friends</li> <li>• may be shared to all friends, a select group of friends, or a single individual.</li> </ul> </li> <li>• Saving/bookmarking                             <ul style="list-style-type: none"> <li>• to save and organise links</li> <li>• links can be searched and recalled or shared</li> <li>• works across any platform.</li> </ul> </li> <li>• Privacy settings                             <ul style="list-style-type: none"> <li>• allows users to control what others can see about them.</li> <li>• information can be shared publicly, limited to all friends, groups of friends or individuals.</li> <li>• can block individuals from viewing a profile entirely.</li> </ul> </li> <li>• Security settings                             <ul style="list-style-type: none"> <li>• allows users to secure their social media account against unauthorised use</li> <li>• passwords may be set</li> <li>• additional security such as two-factor authentication may be set.</li> </ul> </li> <li>• Integration with other platforms                             <ul style="list-style-type: none"> <li>• can be used to log in to online games</li> <li>• can use to log in to other websites.</li> </ul> </li> </ul> <p>Award <b>one</b> mark for a basic description for each function, for example:</p> <ul style="list-style-type: none"> <li>• Ability to send messages to other users</li> <li>• Passwords can be used to secure access.</li> </ul> <p>Award <b>two</b> marks for a more developed description for each function, for example:</p> <ul style="list-style-type: none"> <li>• The messaging services allow users to send messages to each other or groups of users</li> <li>• Privacy settings allow users to set passwords that restrict access.</li> </ul> <p>Credit any other valid response.</p>			

Question	Answer	AO1	AO2	Total Mark
(b)	<i>Describe the ethical implications of the different uses of social media by organisations.</i>	6		6
	<p><b>Indicative content:</b> Answers may refer to the following:</p> <ul style="list-style-type: none"> <li>• Conflicting personal and corporate values. Employees may make posts that go against corporate values e.g. a family based firm would not wish to have an employee post about adult themed issues.</li> <li>• The use of social media for recruitment purposes e.g. viewing posts about an applicant that shows them in an unfavourable light that may be out of context or taken several years ago. This has ethical concerns around privacy and fairness.</li> <li>• The use of social media by influencers to market services and goods on behalf of an organisation without users being aware that they are being targeted for advertising or marketing. This is a form of product placement.</li> <li>• The use of social media by employees of an organisation to discredit its competitors without the user posting making clear their conflict of interest. For example trolling of competitors posts.</li> <li>• Organisations tracking an employee's posts although the employee has no reference to the organisation in their profile or in their posts. Leading to disciplinary action against that employee for a supposed transgression.</li> <li>• Workplace bullying occurring online by other employees acting anonymously and possibly on behalf of the organisation in order to force a resignation.</li> <li>• The use of bots to support marketing campaigns and generate "likes" for an organisation's posts in order to gain a greater audience and generate more custom than it deserves.</li> </ul> <p>Credit any other valid response.</p>			

Band	AO1
3	<p style="text-align: center;"><b>5-6 marks</b></p> <p>A very good description, which shows:</p> <ul style="list-style-type: none"> <li>• thorough knowledge and understanding of the different uses of social media by organisations</li> <li>• a confident grasp of the ethical implications of organisations' use of social media.</li> </ul>
2	<p style="text-align: center;"><b>3-4 marks</b></p> <p>A good description, which shows:</p> <ul style="list-style-type: none"> <li>• generally secure knowledge and understanding of the different uses of social media by organisations</li> <li>• a generally secure grasp of the ethical implications of organisations' use of social media.</li> </ul>
1	<p style="text-align: center;"><b>1-2 marks</b></p> <p>A basic description, which shows:</p> <ul style="list-style-type: none"> <li>• some knowledge and understanding of the different uses of social media by organisations</li> <li>• some grasp of the ethical implications of organisations' use of social media.</li> </ul>
	<p style="text-align: center;"><b>0 marks</b></p> <p style="text-align: center;">Response not creditworthy or not attempted.</p>

Question	Answer	AO1	AO2	Total Mark
9.	<p>Manufacturing industry and domestic users make ever increasing use of smart devices, which in turn places greater demand on internet usage.</p> <p><i>Describe the potential environmental impacts associated with this increased usage.</i></p>	8		8
	<p><b>Indicative content</b> Answers may refer to the following:</p> <ul style="list-style-type: none"> <li>• Digital technologies account for an ever-increasing amount of global emissions, currently around the same as the aviation industry. Increased use of smart devices and the Internet makes this worse.</li> <li>• The data centres required to support smart devices use increasing amounts of electricity which is mostly generated using fossil fuels – a finite resource.</li> <li>• Greater use of smart devices and the Internet requires more infrastructure such as cables being laid and devices to support networking. There is an environmental cost to manufacturing these devices this would include pollution, mining of scarce elements such as manganese.</li> <li>• Lithium, used in batteries of many smart devices, has a high environmental cost including air pollution and soil contamination. Gold mining uses cyanide or mercury to extract the gold from its ore resulting in soil contamination.</li> <li>• The fibre rollout in the UK resulted in increased use of copper and an environmental impact associated with laying cables underground or via telegraph poles.</li> <li>• The equipment used to support greater use of the Internet uses finite resources such as manganese, which is scarce and difficult to extract without a large environmental cost.</li> <li>• Equipment used to support the Internet goes out of date relatively quickly and is often scrapped. Not all the materials used are recyclable and there is an environmental cost of dumping them in landfill e.g. pollution, micro-plastics.</li> <li>• Mobile smart devices using the Internet are responsible for the proliferation of mobile phone masts (which require electricity). The roll out of 5G has increased the amount of masts required as cell sizes get smaller to support bandwidth requirements. There are also concerns about electromagnetic radiation having an impact on health and wildlife.</li> </ul> <p>Credit any other valid response</p>			

Band	AO1
4	<p style="text-align: center;"><b>7-8 marks</b></p> <p>An excellent description which shows:</p> <ul style="list-style-type: none"> <li>• thorough knowledge and understanding of the consequences of increased use of smart devices placing greater demand on internet usage</li> <li>• a confident grasp of the potential environmental impacts associated with this increase.</li> </ul>
3	<p style="text-align: center;"><b>5-6 marks</b></p> <p>A good description which shows:</p> <ul style="list-style-type: none"> <li>• generally secure knowledge and understanding of the consequences of increased use of smart devices placing greater demand on internet usage</li> <li>• a generally secure grasp of the potential environmental impacts associated with this increase.</li> </ul>
2	<p style="text-align: center;"><b>3-4 marks</b></p> <p>A basic response which demonstrates:</p> <ul style="list-style-type: none"> <li>• some knowledge and understanding of the consequences of increased use of smart devices placing greater demand on internet usage</li> <li>• some grasp of the potential environmental impacts associated with this increase.</li> </ul>
1	<p style="text-align: center;"><b>1-2 marks</b></p> <p>A limited response which demonstrates:</p> <ul style="list-style-type: none"> <li>• little knowledge and understanding of the consequences of increased use of smart devices placing greater demand on internet usage</li> <li>• little grasp of the potential environmental impacts associated with this increase.</li> </ul>
	<p style="text-align: center;"><b>0 marks</b></p> <p style="text-align: center;">Response not creditworthy or not attempted.</p>

Question	Answer	AO1	AO2	Total Mark
10.	<p><i>A robot in a car manufacturing plant is to be used for spray-painting cars. The robot is to be programmed online, using the Teach Pendant methodology.</i></p> <p><i>Explain how this robot could be programmed using the Teach Pendant methodology and why this is the most appropriate method in this context.</i></p>		10	10
	<p><b>Indicative content</b> Answers may refer to the following:</p> <p>Method of training:</p> <ul style="list-style-type: none"> <li>• A Teach Pendant device is used to program an industrial robot remotely.</li> <li>• The operator uses the pendant device to move the robot from point to point switching the paint spray on and off as appropriate.</li> <li>• At each point, the speed between points, the force of the spray, and the action (spray paint on or off) is stored and once the programming is complete the robot can operate independently.</li> </ul> <p>Explanation of appropriateness:</p> <ul style="list-style-type: none"> <li>• Allows for precision, co-ordinates can be entered on the pendant that would allow the spray head to be moved in three dimensions.</li> <li>• The movements of a spray head are intricate and the painting process has to apply a consistent coating of paint over a wide area. The precision afforded by a pendant would allow for this.</li> <li>• This does not require a programmer just a technician with a pendant device.</li> <li>• Painting areas in factories are potentially hazardous areas and using a pendant device means the robot can be programmed remotely.</li> <li>• The pendant created program can be adapted for different body parts.</li> <li>• Teach by Example would not be as accurate or consistent as Teach Pendant as it requires a human to provide the action and moving the robot by hand could be arduous and potentially inaccurate.</li> <li>• Teach by Example is not as precise as Teach Pendant as it does not use precise co-ordinates to position the spray head.</li> <li>• Painting robots are very large and moving them by hand as in Teach by Example is not always practicable for a human to do.</li> </ul> <p>Credit any other valid response.</p>			

Band	AO2
4	<p style="text-align: center;"><b>9-10 marks</b></p> <p>An excellent explanation which shows:</p> <ul style="list-style-type: none"> <li>• thorough knowledge and understanding of how the robot could be programmed using the Teach Pendant methodology</li> <li>• thorough consideration of why the Teach Pendant methodology is the most appropriate method in this context.</li> </ul> <ul style="list-style-type: none"> <li>• Writing is very well structured and organised, using accurate grammar, punctuation and spelling.</li> <li>• A range of specialist terminology is used with accuracy.</li> </ul>
3	<p style="text-align: center;"><b>6-8 marks</b></p> <p>A good explanation which shows:</p> <ul style="list-style-type: none"> <li>• generally secure knowledge and understanding of how the robot could be programmed using the Teach Pendant methodology</li> <li>• generally secure consideration of why the Teach Pendant methodology is the most appropriate method in this context.</li> </ul> <ul style="list-style-type: none"> <li>• Writing is generally well structured and organised, using mainly accurate grammar, punctuation and spelling.</li> <li>• Specialist terminology is used with accuracy.</li> </ul>
2	<p style="text-align: center;"><b>3-5 marks</b></p> <p>A basic response which demonstrates:</p> <ul style="list-style-type: none"> <li>• some knowledge and understanding of how the robot could be programmed using the Teach Pendant methodology</li> <li>• some consideration of why the Teach Pendant methodology is the most appropriate method in this context.</li> </ul> <ul style="list-style-type: none"> <li>• Writing shows some evidence of structure though some errors in grammar, punctuation and spelling affect meaning.</li> <li>• Basic use of specialist terminology.</li> </ul>
1	<p style="text-align: center;"><b>1-2 marks</b></p> <p>A limited response which demonstrates:</p> <ul style="list-style-type: none"> <li>• little knowledge and understanding of how the robot could be programmed using the Teach Pendant methodology</li> <li>• little consideration of why the Teach Pendant methodology is the most appropriate method in this context.</li> </ul> <ul style="list-style-type: none"> <li>• Some errors in grammar, punctuation and spelling, which affect clarity of communication.</li> <li>• Limited use of specialist terminology.</li> </ul>
	<p style="text-align: center;"><b>0 marks</b></p> <p style="text-align: center;">Response not creditworthy or not attempted.</p>

## Mapping of questions to specification content and assessment objectives

Question			Specification content (main focus)					Mark allocation			
			Section					Part	Total Marks	AO1 Marks	AO2 Marks
			2.1.1	2.1.2	2.1.3	2.1.4	2.1.5				
<b>1</b>	(a)		1				(a)	1	1		
	(b)	(i)	2				(a)	2	2		
		(ii)	3				(a)	3		3	
	(c)		4				(a)	4		4	
<b>2</b>					4		(b)	4	4		
<b>3</b>	(a)				4		(a)	4	4		
	(b)				4		(a)	4	4		
<b>4</b>	(a)		3				(b)	3	3		
	(b)	(i)			3		(e)	3		3	
		(ii)				6		(e)	6		6
<b>5</b>	(a)			2			(a)	2	2		
	(b)			4			(a)	4	4		
<b>6</b>				6			(a)	6		6	
<b>7</b>						4	(a)	4	4		
<b>8</b>	(a)					6	(b)	6	6		
	(b)					6	(c)	6	6		
<b>9</b>			8				(c)	8	8		
<b>10</b>				10			(c)	10		10	
<b>Total marks</b>			<b>21</b>	<b>22</b>	<b>17</b>	<b>8</b>	<b>12</b>		<b>80</b>	<b>48</b>	<b>32</b>