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Mark Scheme (Provisional)

Summer 2021

Pearson Edexcel International GCSE In Information and Communication Technology (4IT1)

Paper 01: Written Paper

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Summer 2021
Question Paper Log Number P66496A
Publications Code 4IT1_01_2106_MS
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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

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Question Number	Answer	Do Not Accept	Additional Guidance	Mar
1a	Any **two** from: • Wi-Fi • Bluetooth • GPS • 3G • 4G • 5G • Infra-red (IR) • Near-field communication (NFC) Accept any other appropriate wireless connectivity type			**(2)**

Question Number	Answer	Do Not Accept	Additional Guidance	Mark
1b	Any **two** from: • Hard disk / Magnetic disk • Flash (disk) / Solid state • Optical (disk) • (Magnetic) Tape • Cloud	Reference to storage device, rather than the media it uses e.g. Hard drive, disk drive etc. USB stick, USB drive, pen drive.	Accept either 'disk' or 'disc' Accept examples (e.g. 'Blu-ray' for 'optical disk')	**(2)**

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Question Number	Answer	Mark
1c	**The only correct answer is B – ISP** *A is not correct because GPS is used to locate devices, rather than connect to the Internet* *C is not correct because LAN is a type of network, not a method of connectivity* *D is not correct because NFC is short-range peer-to-peer connectivity, rather than Internet connectivity.*	**(1)**

Question Number	Answer	Mark
1d	**The only correct answer is D – Processor** *A is not correct because control software is a specialist application that can be installed as required* *B is not correct because a keyboard is not always needed (e.g. in some embedded systems)* *C is not correct because operating systems are not found in all computers (e.g. some embedded systems).*	**(1)**

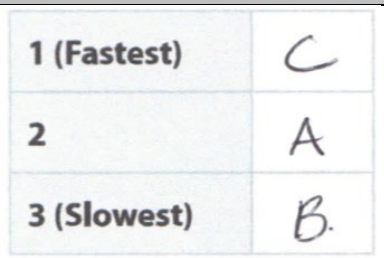
Question Number	Answer	Mark
1e	**The only correct answer is A - Laptop** *B is not correct because a mainframe would be too bulky to use as a desktop replacement computer* *C is not correct because a media player would not have the resources required to replace a desktop computer* *D is not correct because a server stores shared data that can be accessed by clients.*	**(1)**

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Question Number	Answer	Do Not Accept	Additional Guidance	Mar
1f	A description to include **two** linked points from: • Portability • Internet connectivity • Cloud storage • Hosted applications • Collaboration e.g. Workers can connect to the Internet (1) to access cloud storage (1)	Reference to cost	Award **understanding**, rather than use of 'mark scheme terminology'. e.g. • You can access Internet apps (1) to work with others (1) • It is light (1) so you can transport it easily between work and home (1)	**(2)**

Question Number	Answer	Do Not Accept	Additional Guidance	Mark
1g	• 1 mark for sight of 8 (or 2^3) • 1 mark for sight of 1024 • 1 mark for complete expression: $16 \times 1024^2 \times 8$ Accept for 1024^2 • 1024 x 1024 • 2^{20} Although **not** required by the question, award all **three** marks for the result of the calculation: **134,217,728**	1000 for 1024	Award 1 mark for sight of: 16,777,216 **OR** 16,384 as implies sight of 1024 Award 2 marks for sight of: 8,388,608 **OR** 8,192 **OR** 131,072 as implies sight of 8 **AND** 1024 Example of a two-mark response: • Sight of 8 • Sight of 1024 8 bits = byte 1024 bytes. Example of a three-mark response: $16 \times 8 \times 1024^2$.	**(3)**

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Question Number	Answer	Mark
1hi	 **One** mark for **one** item in the correct location. **Two** marks for **all** items in the correct location. Award if the correct drives given, rather than latters C, A, B	**(2)**

Question Number	Answer	Do Not Accept	Additional Guidance	Mark
1hii	Two descriptions, each to include **two** linked points from: • Mechanical process • Latency • Read/write head • Non-sequential data • RPM • Platters / disk(s) e.g. The latency (1) of the read/write head (1) The revolutions per minute (RPM) (1) at which the platter/disk spins (1)		Two marks are available for each linked response. A single mark can be awarded for an appropriate independent point. Award **understanding**, rather than use of 'mark scheme terminology'. e.g. • If the read head is slow (1) in getting to the data (1) • It uses a motor (1) to spin the disk (1)	**(4)**

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Question Number	Answer	Do Not Accept	Additional Guidance	Mar
1hiii	Award one mark for a benefit e.g.: • It is more sustainable • Reduces/mitigates the impact on the food chain • Less need to find more raw materials and one mark any one reason for that benefit, e.g. • less plastic used • fewer precious metals used/required/mined • it stops waste materials leaking into the ground/water supply/food chain • less energy/fossil fuel used in the production process		Examples of linked responses: It is more sustainable (1) because fewer precious metals used/required/mined (1) Reduces/mitigates the impact on the food chain (1) because fewer waste materials leak into the ground/water supply/food chain (1) The need to mine more is delayed (1) because precious metals are reused (1) Non-renewable resources like oil are not depleted (1) because less plastic is used (1)	**(2)**

Question Number	Answer	Mark
1hiv	**The only correct answer is D - Utility** *A is not correct because control software creates an output based on input(s)* *B is not correct because office-productivity software is centred on creating documents and manipulating data* *C is not correct because project management software allows users to plan, collaborate and work towards deadlines.*	**(1)**

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Question Number	Answer	Do Not Accept	Additional Guidance	Mark
2a	• Wiki • Forum Accept: 'Website' Accept: Examples (e.g. Wikipedia) Accept: Any other appropriate user-generated reference sites		Accept: • News groups • Message boards • Review sites	**(2)**

Question Number	Answer	Do Not Accept	Additional Guidance	Mark
2b	A drawing that shows **three** from: • Microphone • Speaker / headphone / earphone • Touch screen / keyboard / buttons • Display screen		Award the mark if the device is not labelled but can be easily recognised.	**(3)**

Question Number	Answer	Mark
2c	**The only correct answer is D - Secures data** *A is not correct because setting file permissions does not improve encryption* *B is not correct because setting file permissions does not increase storage* *C is not correct because setting file permissions does not increase backup speeds.*	**(1)**

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Question Number	Answer	Do Not Accept	Additional Guidance	Mar
2d	A description to include two linked points: • Challenge / Verification of media • Human readable / not machine readable • Restricts automated access to systems e.g. Requires verification of images/characters/sounds (1) that can only be understood by humans (1) Accept 'read' for 'understood'.		A single mark can be awarded for an appropriate independent point. Award **understanding**, rather than use of 'mark scheme terminology'. e.g. • Something that only a human can understand (1) so bots cannot carry out DDS attacks (1) • Picking out parts of an image that show traffic lights (1) which is something that only humans could see (1) • Understanding text (1) that is not something a computer could scan (1)	**(2)**

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Question Number	Answer	Do Not Accept	Additional Guidance	Mar
2e	Award one mark for a positive impact of cloud-based services on learning and one mark for any one reason for that positive impact. e.g. Access from anywhere/anytime / (1) because storage/applications are hosted online (1) Reduced cost of providing learning (1) because more students can be reached with a single resource (1) Collaboration made easier (1) because the document is hosted online (1) Accept any other appropriate response	Responses that reference a benefit to something other than learning, e.g. a benefit to the school (e.g. saving money, power) or the environment (no access to books may save trees)	Award **understanding**, rather than use of 'mark scheme terminology'. e.g. • Can work with others (1) as hosted on Google (1) • Students do not need to travel to school, less bullying (1) as you can work without seeing your classmates with less mental health problems (1) • can access on the move (1) because the file is hosted online (1) • can learn from home (1) because Teams is in the cloud (1) • work is available from a central location (1) [no second mark]	**(2)**

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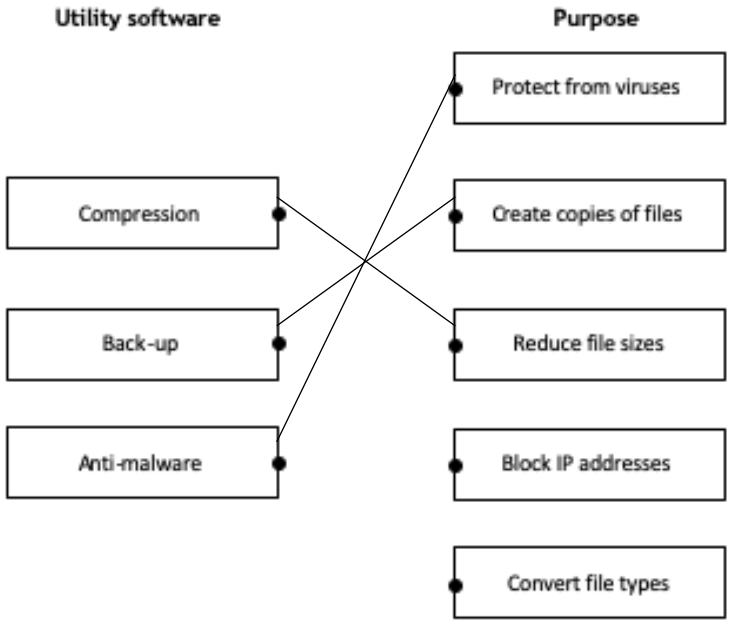
Question Number	Answer	Do Not Accept	Additional Guidance	Mark
2f	A description to include two linked points from: • Mobile phone network / 3G / 4G / 5G • Internet • Data sent/received • Use of wireless connectivity / radio waves e.g. The mobile phone network (1) provides access to the Internet (1)	Reference to web browser	A single mark can be awarded for an appropriate independent point. Award **understanding**, rather than use of 'mark scheme terminology'. e.g. • Put your SIM in (1) to receive data over the phone network (1) • Use 4G (1) to access the Internet (1)	**(2)**

Question Number	Answer	Do Not Accept	Additional Guidance	Mark
2g	Any **one** from: • Access the Internet when on the move • Lack of wired infrastructure • Poor performance of wired connectivity • Cheaper than having both a landline and mobile contract. • More secure than using a third-party provider (e.g. public Wi-Fi) Accept any other appropriate reason.		Award **understanding**, rather than use of 'mark scheme terminology'. e.g. • Send messages when you are going to see your friends	**(1)**

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Question Number	Answer	Do Not Accept	Additional Guidance	Mar
2h	Award one mark for a benefit and one mark for any one reason for that benefit. e.g. Faster data transfer (1) because of **l**ower latency / higher bandwidth / no blockages (1) More secure (1) because you would need physical access to the media (1) More reliable (1) because not as susceptible to interference (1)	'Faster' on its own	Award **understanding**, rather than use of 'mark scheme terminology'. e.g. • Able to transfer a file more quickly (1) as wired has more bandwidth (1) • Less lag (1) because other signal waves can't affect it (1) • The connection won't drop out (1) as not affected by distance or walls (1)	**(2)**

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Question Number	Answer	Do Not Accept	Additional Guidance	Mar
3a	Award **one** mark for each correct line, up to a maximum of **three** marks.  	Do not award marks if more than one line drawn to or from a box.		**(3)**

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Question Number	Answer	Mar
3b	The only correct answer is D - Storage *A is not correct because memory does not have software installed to it* *B is not correct because not correct because an OMR reader does not have software installed to it* *C is not correct because a processor does not have software installed to it.*	**(1)**

Question Number	Answer	Do Not Accept	Additional Guidance	Mark
3c	Award one mark for a benefit and one mark for any one reason for that benefit. e.g. • It enhances security (1) because it fixes bugs/vulnerabilities (in the software) (1) • It provides new features (1) so she can be more productive (1) • It ensures compatibility (1) because **t**he operating system/hardware has changed (1) Accept any other appropriate response.		Award **understanding**, rather than use of 'mark scheme terminology'. e.g. It fixes bugs (1) so she is less likely to get a virus (1) Makes her laptop more secure (1) as exploits are closed (1) It will give her better graphics (1) to she has a better experience (1)	**(2)**

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Question Number	Answer	Do Not Accept	Additional Guidance	Mark
3d	Award one mark for a reason and one mark for an expansion. e.g. • There is limited bandwidth available (1) because it has to be shared between many users (1) • Users experience could be negatively impacted (1) because not enough bandwidth is available to stream a high quality video (1) • It would reduce the bandwidth available to other users (1) because video requires **lots of** data / bandwidth (1) • There would be a greater cost (1) because increasing the bandwidth is expensive (1)	Responses related to blocking inappropriate content.	'experience could be negatively impacted' may be articulated as 'low Internet speed', etc.	**(2)**

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Question Number	Answer	Do Not Accept	Additional Guidance	Mark
3e	Any **two** from • Cooperative/Online gaming • Catch-up TV • Booking systems • Multi-user sports (e.g. Peloton etc) • Online training/gym sessions • Crafting/hobby sessions • eBooks • Choirs/music/sing alongs • Video parties • Quizzes • Cook-alongs Accept 'brand names' (e.g. iPlayer) Accept any other reasonable response.			**(2)**

Question Number	Answer	Mark
3f	**The only correct answer is B - GPS does not use an Internet connection** *A is not correct because GPS is not used by all digital devices* *C is not correct because GPS does not use cloud computing* *D is not correct because GPS is not better if open source software is used.*	**(1)**

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Question Number	Answer	Do Not Accept	Additional Guidance	Mar
3g(i)	A description to include **four** from: Users' previous activity / visits / page views (stored in cookies) (1) are read (1) then analysed (1) then matched (1) with posts that contain similar key data / metadata (1)		A description of a process requires logically linked responses. Individual statements are awarded 1 mark max. Candidates may respond using other examples of transactional data and/or examples of metadata	**(4)**

Question Number	Answer	Do Not Accept	Additional Guidance	Mark
3g(ii)	Award one mark for a reason and one mark for an expansion. e.g. • To protect privacy (1) because personal data/information is gathered/used (1) • To protect privacy (1) because companies sometimes use data for customised/targeted marketing / tracking / personalisation (1)	'Security' for 'privacy'	Award **understanding**, rather than use of 'mark scheme terminology'. e.g. It can make your data less private (1) because companies can spy on you (1)	**(2)**

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Question Number	Answer	Mark
4a	**The only correct answer is B - Copyright, Designs and Patents Act** *A is not correct because the computer Misuse Act protects against unauthorised access and modification of data* *C is not correct because the Human Rights Act protects the rights and freedom of UK citizens* *D is not correct because the Data Protection Act controls how personal information and data is handled.*	**(1)**

Question Number	Answ**er**	Do Not Accept	Additional Guidance	Mark
4b	Any **three** from: • Wider audience / widespread reach of the Internet • Links from other sites / targeted marketing • Collecting customer's (transactional) data • Music can be sold at any time Accept any other reasonable response	Responses related to payment		**(3)**

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Question Number	Answer	Do Not Accept	Additional Guidance	Mark
4c	Two linked explanations, each including one way he has protected himself and one reason for doing it: e.g. • His profile is private (1) so that he can control / only people he allows can see his information (1) • Location settings are off (1) so that criminals/people who want to do him harm cannot find him (1) • He uses an avatar (1) so that people cannot identify him from his image (1)		Award **understanding**, rather than use of 'mark scheme terminology'. e.g. He's used a cartoon image (1) so you can't see what he really looks like (1)	**(4)**

Question Number	Answer	Do Not Accept	Additional Guidance	Mark
4d	Award one mark for a reason and one mark for an expansion. e.g. • An embedded system cannot carry out complex requests (such as these) / can only carry out limited operations (1) because it has less processing power (1)		Award **understanding**, rather than use of 'mark scheme terminology'. e.g. An embedded system has less processing power (1) because it only has to run simple programs. (1)	**(2)**

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Question Number	Answer	Do Not Accept	Additional Guidance	
4ei	Any **two** from: • Recording • Layering / multi-track • Cut • Join • Trim • Split • Solo • Mute • Crossfade • Fade in • Fade out • Group • Bounce • Mixdown • EQ / equalisation • Effects (e.g. reverb) • Reverse • Noise reduction • Normalisation • Compression • Change tempo Accept any other reasonable response			**(2)**

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Question Number	Answer	Do Not Accept	Additional Guidance	Mar
4eii	Two descriptions, each to include one feature and one use of that feature for the given scenario. e.g. • Gantt chart / timeline (1) to visualise milestones/dependencies / sequence subtasks (1) • Collaboration/scheduling tools (1) to share the workload / notify others when a task is ready for them to process (1) • Reporting tools (1) to keep key stakeholders informed of progress. (1) • Human resource management tools (1) so stakeholders can see who is doing which task (1)		Award **understanding**, rather than use of 'mark scheme terminology'. e.g. Share button (1) so you can work with others (1)	**(4)**

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<table>
<tr><th>Question Number</th><th>Indicative content</th></tr>
<tr><td>4f</td><td>Candidates should discuss different aspects, giving evidence for each one.
<table>
<tr><th>Aspect</th><th>Advantages of desktops</th><th>Disadvantages of desktops</th></tr>
<tr><td>Components</td><td>Performance of desktop components far outperforms other form factors, meaning audio processing will be faster.
Audio editing requires the latest performance with increasing demand from new software features.</td><td>Components (processors / hard drive / graphics etc.) are more powerful, so require more cooling and the fans create noise, which could affect recording.
Convergence and high quality peripherals removes the need for multiple specialist devices.</td></tr>
<tr><td>Portability / New form factors</td><td>Touchscreen input peripherals are now common, making audio work more natural.</td><td>Laptops / Tablets / Smartphones:
Long battery life, size, weight, user interface, integrated sensors and apps make it easier to work on the move, allowing instant recording of ideas.</td></tr>
<tr><td>Connectivity</td><td>Wired connections are more reliable and often faster, meaning ideas can be shared quicker. More connectivity options so increased compatibility with specialist peripherals.</td><td>-</td></tr>
<tr><td>Cost</td><td>Desktops can be custom built cheaply</td><td>Convergence continues to reduce cost of mobile devices</td></tr>
<tr><td>Upgradability / Maintenance</td><td>Desktop form factor is becoming the only one to allow user to do this, futureproofing and reducing long term costs.</td><td>-</td></tr>
</table></td></tr>
</table>

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Level	Mark	Descriptor (AO3 – Discuss)
	0	**No rewardable material.**
1	**1-3**	A limited number of points will be identified, which may only support one point of view. At least one point will have evidence to support it. The discussion will have few (if any) links to the scenario. There may be a conclusion, but this is likely to be a simple statement. The response will lack clarity and organisation.
2	**4-5**	A range of points will be identified, which compare different points of view, though the discussion may be unbalanced. Some points will be supported by evidence. The comparisons will include links to the scenario but may include some generic points. A conclusion will be included, which will link with the comparison, though the link may be implicit. The response will show some focus but may not be well organised.
3	**6-8**	The discussion compares a range of different points of view. Most points will be supported by evidence. The majority of the discussion will link to the scenario. A conclusion will be given that clearly links to the comparisons made in the discussion. The response will show good focus and organisation.

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Question Number	Answer	Do Not Accept	Additional Guidance	Mar
5a	Award one mark for a drawback and one mark for a reason for the drawback. e.g. • The images may be less clear/colourful/engaging (1) because less data is used to represent the image (1) • It might be harder to navigate (1) because it might not be obvious what the images on the buttons are (1)		Award **understanding**, rather than use of 'mark scheme terminology'. e.g. images may be pixelated (1) because the resolution is too low (1) site looks unprofessional (1) as images are pixelated (1)	**(2)**

Question Number	Answer	Do Not Accept	Additional Guidance	Mark
5b	Award one mark for each component and one mark for a function of that component. e.g. Modem (1) converts digital data to/from a digital form (1) Gateway (1) connects a LAN to a WAN (1) Switch/Hub (1) connects multiple devices (1) Router (1) finds the best path for data across a network (1) Wireless Access Point / WAP (1) allows devices to connect to the network using Wi-Fi (1) Bridge (1) connects two LANs (1) Fibre optic / copper cable / radio waves (1) that transmit the data (1)	Devices that do not transfer data: e.g. Filter Firewall Server		**(4)**

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Question Number	Answer	Do Not Accept	Additional Guidance	Mark
5c	An explanation such as: The data is not stored permanently (1) because it is buffered / cached (1)		Award **understanding**, rather than use of 'mark scheme terminology'. e.g. The music is downloaded to the device as the user is listening (1) it is not stored on the device (1) The data is stored in the buffer (1) until it has finished playing (1) Only a small amount of data (1) is downloaded into a buffer (1) Users can listen to the music while it is being downloaded (1) [no second mark]	**(2)**

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Question Number	Answer	Do Not Accept	Additional Guidance	Mark
5d	A description to include **three** linked points: Encryption (1) encodes/scrambles data / makes data unreadable (1) using a key (1)			**(3)**

Question Number	Answer	Do Not Accept	Additional Guidance	Mark
5e	A description to include: WPA generates a new key for each device on the network (1) rather than using a shared key (1)			**(2)**

Question Number	Answer	Do Not Accept	Additional Guidance	Mark
5f	An explanation to include a positive impact and a reason for that impact. e.g. Applications load more quickly (1) because there is less load on the server's processor (1)		Award **understanding**, rather than use of 'mark scheme terminology'. e.g. A simpler application loads more quickly (1) as less processing power (1) is required There is less lag (1) as less processing power is required (1)	**(2)**

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Question Number	Indicative content
5g	Candidates should draw on evidence including strengths, weaknesses, alternative actions, relevant data or information. They should come to a supported judgement of how online communities have impacted on how we socialise. The indicative content is not exhaustive/prescriptive, and students should be credited for other relevant content. • Nature of relationships (e.g. the way in which friendships develop) • Ability to make connections and build networks (access to wider range of people / cultures) • Social networks / SMS / Text (chat) • Voice / Video calling / messaging • Body language / emotion / tone of voice / non-verbal communication / nuance of language (can be misinterpreted / lost) • Speed at which connections/friendships can be made in person vs online • Safety features (may restrict access to some people) • 'Bubbles' may mean we are not linked with people outside of our usual social groups • Allows people to socialise when not allowed to socialise in person • We can become distracted from in person communication • It has brought a greater focus to socialising, an 'always available' culture / less opportunities to 'switch off' • Fear Of Missing Out (FOMO) can lead to less meaningful interactions / interaction for the sake of interacting.

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Level	Mark	Descriptor (AO3 – Evaluate)
	0	**No rewardable material.**
1	**1-3**	An attempt at evaluation will have been made. A range of evidence will be identified, though not all of it will be useful. Some of the evidence will have been discussed. The discussion will have few (if any) links to the subject and/or context. There may be a conclusion, but this is likely to be a simple statement and not a supported judgement. The response will lack clarity and organisation.
2	**4-5**	The evaluation will have identified evidence that can be used to make a judgement. There will be a range of useful evidence including some of strengths, weaknesses and/or relevant data. The discussion of evidence will have some links to the subject and/or context. There will be a conclusion that makes a judgement on the subject's qualities. The response will show some focus but may not be well organised.
3	**6-8**	The evaluation will have reviewed evidence and provided a conclusion. An appropriate range of evidence will be identified and used. The evidence will be used to come to a judgement that uses most of the evidence. A conclusion will be given that clearly links to the comparisons made in the discussion. The response will show good focus and organisation.

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