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| **Question** | | | **Answer** | **Mark** |
| 1 | a | i | Utility software is a software that helps to configure, optimise or maintain a computer | 1 |
| 1 | a | ii | 1 mark for each bullet point, upto 2 marks   * Disk Defragmentation software * System diagnostic tools * Backup software * Compression software * File Management software | 2 |
| 1 | b | i | Disk Defragmentation software | 1 |
| 1 | b | ii | 1 mark for each bullet point, upto 3 marks   * Defragmentation software reduces fragmentation by moving files on the hard disk * The empty area collected together * Different bits of the same file are moved to be stored together * This means the read/write heads won’t need to move as far across the disk, so the read/write speed should improve | 3 |
| 1 | b | iii | When the hard disk is fragmented, it will take longer to read/write data on the hard disk [1]. This in turn may slow down the computer [1] | 2 |
| 2 | a |  | 1 mark for each bullet point, upto 2 marks for each component   * The Control unit controls the flow of data around the system , * both inside the CPU and between input and output devices * Control signals are sent to the ALU, cache and memory registers * The Arithmetic Logic Unit (ALU) is where calculations * and logic operations are carried out. * Cache is a small area of very fast memory * within the CPU used to store data when carrying out instructions. * Stores the most commonly used instructions * Prevents data bottlenecks when communicating with RAM and secondary storage. | 6 |
| 2 | b |  | 1 mark for each bullet point   * The CPU fetches instructions from memory * e.g LOAD 5. * The CPU / Control Unit decodes the instruction ... * ….in order to understand what it says. * The instruction is then executed * The process is repeated. | 3 |
| 3 | a |  | Basic Input/Output System | 1 |
|  | b |  | 1 mark for each bullet point, upto 2 marks   * The BIOS are used when the computer is booting/starting up * They connect the hardware with the software. * Loads the boot loader. | 2 |
|  | c |  | 1 mark for each bullet point, upto 2 marks   * RAM is volatile * which means that when the power is off the data are deleted from RAM * ROM is non-volatile * The BIOS needs to be stored in a place they are not lost with power. * The BIOS needs to be stored in a place where a user shouldn’t be able to interfere with them. | 2 |
| 4 | a |  | 1 mark for each bullet point, upto 2 marks   * When RAM is full * A secondary storage space is being used to create virtual memory * Programs that are open but are not currently being used are transferred into virtual memory * to free up some space from RAM * If programs from virtual memory need to be used they need to swap over with a program from RAM. | 4 |
| 4 | b |  | Adv:   * Free up some RAM for the computer to open up more programs   Dis:   * Virtual memory is much more slower than RAM | 2 |
| 5 | a |  | CD-ROM - Optical  Hard disk drive - Magnetic  USB memory stick - Solid State | 3 |
| 5 | b |  | Adv:  Large Capacity  Dis: | 4 |
| 5 | c |  | 4 TB = 4000 GB = 4,000,000 MB | 2 |
| 6 | a |  | 1 mark for stating an advantage, 1 mark for explaining   * Easy to increase storage * System software are updated automatically * Remote Access * Security is not your responsibility * More than one person can edit at the same document * No need to buy expensive equipment for storage * No need to pay an IT specialist to manage storage | 4 |
| 6 | b |  | 1 mark for stating a disadvantage, 1 mark for explaining   * Need internet connection to access files amdm data * SEcurity could be an issue as you lose control of your data and become vulnerable to hackers * Usually subscription fees are added after certain amount of free storage * Unclear who owns the data. |  |
| 7 |  |  | **Mark Band 3–High Level (5-6 marks)**  The candidate demonstrates a thorough knowledge and understanding of a wide range of considerations in relation to the question; the material is generally accurate and detailed. The candidate is able to apply their knowledge and understanding directly and consistently to the context provided. Evidence/examples will be explicitly relevant to the explanation.. There is a well-developed line of reasoning which is clear and logically structured.  **Mark Band 2-Mid Level (3-4 marks)**  The candidate demonstrates reasonable knowledge and understanding of a range of considerations in relation to the question; the material is generally accurate but at times underdeveloped. The candidate is able to apply their knowledge and understanding directly to the context provided although one or two opportunities are missed. Evidence/examples are for the most part implicitly relevant to the explanation. There is a line of reasoning presented with some structure.  **Mark Band 1-Low Level (1-2 marks)** The candidate demonstrates a basic knowledge of considerations with limited understanding shown; the material is basic and contains some inaccuracies. The candidate makes a limited attempt to apply acquired knowledge and understanding to the context provided. The candidate provides nothing more than an unsupported assertion. The information is basic and communicated in an unstructured way.  **0 marks** No attempt to answer the question or response is not worthy of credit  **Things that can be included (not limited to this):**   * Encryption of students’ data   + So if it is accessed by a hacker it is unreadable * Anti-Malware Software   + Prevents harmful programs from being installed * Penetration testing   + Finds and identifies weaknesses in the system * Firewalls   + Prevent the network from unauthorised access * User access levels   + Only lets people on the network with authorisation access the data * Passwords   + Protect the data so only authorised users can access it * Physical security   + Store servers/computers in a locked room * Can mention Data Protection Act 2018   + Data must be processed lawfully and fairly with consent.   + Data must only be collected for a specific legitimate purpose   + Data must be relevant   + Data must not stored for longer than necessary and deleted if asked   + Data must be accurate and up to date   + Data must be kept secure   + Data controllers must prove their data protection measures are sufficient |  |
| 8 | a |  | * Phishing is when a hacker poses as a known organisation or website * and tries to trick the recipient into giving away their personal information e.g. Credit Card info. | 2 |
| 8 | b | i | Malicious software installed on someones device without their knowledge, softwares intent is to disrupt, damage or to gain unauthorised access to a computer system | 1 |
| 8 | b | ii | * Virus * Hides (embeds itself) in files/other programs * Replicates itself when infected files are shared * Worm * Standalone program that doesn’t need to attach itself to an existing program * Replicates itself without human intervention * Trojan * Type of malware disguised as legitimate software * Does not replicate, installed by user themselves. | 6 |
| 9 | a |  | 1 mark per bullet point, up to 2 marks   * All computers are connected to each other * All computers have an equal ranking/status * All computers can both request and provide services * Each computer stores their own files * Backups are done individually * Security is done individually * No central server | 2 |
| 9 | b |  | 1 mark per bullet point, up to 2 marks   * All devices connected to a powerful central server * Files and backups stored centrally * Security done centrally * May have user access levels | 2 |
| 9 | c |  | Benefits of Client Server:   * Computers can share peripheral devices e.g. printers * Server controls access to shared resources * Can have user access levels - more secure * Network Security and backups done centrally - more secure * Files stored centrally - easier to manage | 2 |
| 10 |  |  | 1 mark per bullet point  TCP   * Transmission Control Protocol * TCP is used to send and receive data packets * around different networks   HTTP   * Hypertext Transfer Protocol * Used by web browsers or servers * for hosting/presenting a website   HTTPS   * Hypertext Transfer Protocol Secure * Encrypted communication between server and client   SMTP   * Simple Mail Transfer Protocol * Sending emails | 6 |
| 11 | a |  | 1 mark per bullet point, upto 2 marks   * An IP address is a unique identifier for a computer * when it access the Internet * It changes every time the computer goes on the Internet * There are two types of IP addresses static and dynamic | 2 |
| 11 | b |  | 1 mark per bullet point, upto 2 marks   * A MAC address us a unique identifier for a computer * It is hard wired into the computer * Used within a LAN when sending and receiving data | 2 |
| 11 | c |  | 1 mark per bullet point, upto 3 marks   * Receives the complexity of the problem into sub-problems * Easier to develop problems * Devices can be manufactured to operate at a particular layer * Products from different vendors will work together * Changing one layer won’t affect another. | 3 |