MODULE H SOFTWARE · H8

Utility software: mark scheme

~25 minutes · 22 marks · OCR J277 spec 1.5.2

How to use. 1 mark per bullet up to the maximum shown. **/** separates alternative answers; **//** separates alternative statements for the same mark. Words in (brackets) are not needed for the mark. **NE** = not enough. **BOD** = benefit of the doubt. Spec points covered (J277 1.5.2): the purpose and functionality of utility software; encryption software, defragmentation and data compression, and why each is required; computers often come with utility software that performs housekeeping tasks; utility software is needed for additional tasks that may not be carried out by an operating system. Q1 also uses OS functions from 1.5.1. This part is OCR only: Cambridge 0478 4.1.1 needs utility software only as a type of system software (tested in H1), and does not name defragmentation.

QUESTION	ANSWER	MARKS	GUIDANCE
1 J277 1.5.2, 1.5.1	Rearranges the hard disk so the parts of each file are together: utility software Decides how much RAM each running program is given: operating system Reduces the size of a large video file: utility software Gives each person their own account and login: operating system	**4**	1 mark per correct row. Two ticks in a row = 0 for that row. Rows 1 and 3 are defragmentation and compression (1.5.2); rows 2 and 4 are memory management and user management (1.5.1).
2(a) J277 1.5.2	The parts of each file are in consecutive blocks, in order (A1 A2 A3 together, B1 B2 B3 together, C1 C2 together) All four free blocks are grouped together in one place (e.g. blocks 9 to 12) Example answer: 1 2 3 4 5 6 7 8 9 10 11 12 A1 A2 A3 B1 B2 B3 C1 C2	**2**	1 mark per bullet. Accept the files in any order (e.g. C, then A, then B) and the free space at the start instead of the end, as long as the free space is one group. Do not award mark 1 if a block is missing or repeated, or if the parts of any file are split up or out of order. Mark 2 can be awarded even if mark 1 is not, if 8 blocks are filled and 4 free blocks are together.
2(b) J277 1.5.2	Before: the read/write head has to move to several different places on the disk (blocks 1, 4 and 8) to read File A After: the parts of File A are next to each other // in consecutive blocks, so the head reads them in one go / without jumping around The head makes fewer movements // moves a shorter distance ... so less time is spent moving the head // File A is read / opened faster	**2**	1 mark per bullet, max 2. The fourth bullet needs a point about head movement first. "The file is faster" / "the computer is faster" alone = NE. Do not award answers saying the head moves faster (it is the same head speed; it moves less), or that the file gets smaller.

QUESTION	ANSWER	MARKS	GUIDANCE
3 J277 1.5.2	Defragmentation makes each file smaller: False Encryption stops data from being intercepted: False A compressed file can usually be sent more quickly: True Defragmentation is not needed on a solid-state drive: True	**4**	1 mark per correct row. Two ticks in a row = 0 for that row. Row 1: defragmentation moves the parts of files; it does not change file size (that is compression). Row 2: encryption does not stop interception; it means intercepted data cannot be understood without the key. Row 4: a solid-state drive has no moving read/write head, so fragmented files do not slow access in the same way.
4(a) J277 1.5.2	Compression software reduces the (file) size of the folder / drawings ... so the folder can fit within / under the 25 MB attachment limit // so it can be sent by email (when it is 30 MB it cannot) The smaller file takes less time to upload / send / download // is transferred faster across the network / internet Uses less bandwidth / data when it is sent Takes up less storage space (in the email accounts / on the client's computer) The folder can be compressed into a single file // one attachment instead of many files	**3**	1 mark per bullet, max 3. "Makes it smaller" = BOD for bullet 1 if the context is the folder / files. "Faster" alone = NE: must say what is faster (sending / uploading / downloading). The second bullet needs the size reduction (bullet 1) to be stated or clearly implied. Do not award points about losing quality or "losing data": building drawings would not be sent with lossy compression. Credit any other valid point.
4(b) J277 1.5.2	The files take up less storage space (on the server) // more projects / files can be stored on the server // saves buying more storage	**1**	Any one. "Saves space" = BOD. "Faster to send" = 0 here (the files are being stored, not sent). "To keep them safe / secure" = 0 (that is not what compression does). Credit any other valid answer (e.g. backups of the server take less space / time).

QUESTION	ANSWER	MARKS	GUIDANCE
5(a) J277 1.5.2, 1.3.2	Encryption software scrambles / encodes / changes the contract (using a key / an encryption algorithm) Anyone who intercepts it cannot understand it // it is meaningless ... without the (correct) key Only the client (who has the key) can decrypt it / turn it back into the original contract	**2**	1 mark per bullet, max 2. "Cannot be read / accessed / opened" alone = NE: intercepted data can still be read; it cannot be understood. Do not award "stops it being intercepted" / "stops hackers getting it": encryption does not stop interception. "Locks the file" = NE. Symmetric / asymmetric (public / private) keys are not needed for OCR; credit if correct but not required.
5(b) J277 1.5.2, 1.3.2	The (correct / decryption) key	**1**	Accept "the key used to decrypt it" / "the private key". "A password" alone = NE. Do not accept "encryption software" alone or "the internet".
6 J277 1.5.2	Utility software carries out additional / housekeeping / maintenance tasks that the operating system may not carry out (itself) Without defragmentation, the hard disk becomes (more) fragmented (as files are saved, edited and deleted) ... so files / drawings take longer to open Without compression software, files such as the drawings take up more storage space // may be too large to email / take longer to send Without encryption software, contracts / client data that are intercepted or stolen could be understood	**3**	1 mark per bullet, max 3. Max 2 if no utility is linked to the practice's computer or files (the question asks for this). Naming a utility with no reason (e.g. "it needs defragmentation") = NE. Accept other utilities (e.g. anti-malware, backup, disk clean-up) if a valid housekeeping reason is given. "The OS cannot do everything" alone = BOD for bullet 1.

Total: 22 marks