1.5 – Systems Software – Past Exam Questions – Solutions

Sample Paper

9	a		• Orders have been saved onto the system as they order food and then deleted once processed (1) • Once other orders have been made, new files are created (1) which may be bigger than the spaces left by the deleted files (1) • The order files are split up (1)	4 (AO2 1b)	Up to a maximum of 4 marks. A maximum of three marks if there is no contextualisation. Allow a mark if candidates state that fragmentation increases access time. (1)
9	b		• Files on the hard disk drive are moved (1) • Empty spaces collected together (1) • Files are moved to be stored together (1) • Fewer disc accesses are needed (1)	3 (AO1 1b)	Up to a maximum of 3 marks.

2021

2	a		1 mark for name, max 2 for description. e.g. • user interface • allows the user to communicate with the hardware • e.g. GUI/command prompt • allows the user to input data • outputs data to the user • memory management / multitasking • moves data between RAM and VM • gets data from RAM • stores data to RAM	6	Read whole answer for each. Max 2 for description, 1 mark for name.
			• switches between processes so fast it appears like it is multitasking • peripheral management / drivers • allows the installation of drivers to communicate with the peripherals • sends data to/from peripherals • sends data to/from buffers • user management • allows the setting up of accounts • security / setting of password • set different access rights • file management • creation/editing/renaming of files • creation/editing/renaming of folders • movement of files/folders		
2	b	i	Perform housekeeping/maintenance tasks	1	Not by example. Allow optimising system.
2	b	ii	1 mark per bullet to max 3 • full backup will copy every file and all data • incremental will only copy files/data that have changed • …incremental can only be done once a full backup has been completed • …reduces time taken to backup each time • …reduces storage/memory used to backup	3	

2020

5	a		1 mark for each correct word The operating system provides a user **interface**. This displays the output to the user and allows the user to interact with the **hardware**. The operating system controls the movement of data from a hard drive to **RAM** and vice-versa. This is known as memory management. The Operating system can only perform one process at a time, but by managing the memory the computer can appear to be completing more than one process at a time. This is known as **multitasking**. An operating system allows device **drivers** to be installed to allow an external piece of hardware to interact with the **processor**. The operating system provides security through user accounts and **passwords**. It also creates and maintains a file system to organise files and **directories**.	8	BOD hardware with peripherals/processor/printer

5	b	i	1 mark for: • Collate free space together Max 2 from • Collate file fragments together/contiguously • All of **file 1** will be stored **consecutively** • All of **file 2** will be stored **consecutively** • All of **file 3** will be stored **consecutively**	3	Allow diagram Do not award gives more free storage space. Do not award 'similar' files are grouped together.
5	b	ii	1 mark per bullet to max 2 • When one page is read it does not have to search for second page // does not have to search through all the pages // does not need to reassemble the individual pages • Does not have to physically move as far to get the next part of the file • Less physical movement saves time • Multiple locations do not need accessing // fewer individual accesses	2	Answer must relate to why it is faster.
5	b	iii	1 mark for each example e.g. • Backup • Encryption • Compression • Firewall • Anti-virus // anti-malware • Anti-spyware // anti-malware	3	Only award anti-malware once.

2018

Question			Answer	Mark	Guidance
1	(c)	i	1 mark per bullet to max 3 e.g. Incremental: • Only the changes need to be backed up • The software/OS/settings are unlikely to have changed between backups • Small number of files likely to be used/edited between backups • Take less time to backup • Each backup will take less memory space to store Full: • Backup all the data/files and software • It might not take a significant time to back up entire system • He might only have a small number of files to be backed up each time • Safer as have more past versions to revert to • User may have changed settings on computer • Faster to restore the backup • Needs to do a full before he can do an incremental	3 AO2 1a (1) AO2 1b (2)	Discussion must match the backup given. Either method is acceptable, marks are awarded for the justification. Allow marks for why the other is not appropriate. If there is no method given, or both, then read the answer and mark their justifications. It must be clearly given which method each point refers to.
1	(c)	ii	1 mark for naming program, 2 for description of use e.g. • Encryption software • Scramble/encode/mix up data • …so it cannot be read/understood if intercepted/stolen • Defragmentation • Move free space together • Move files together • E.g. Faster access to files • (Data) compression • Reduce the file size of files // makes files smaller • To use less storage space • Faster transmission • To store more files • Anti-virus / anti-malware • To help protect computer/data against viruses/malware • To scan the computer to look for/quarantine/remove viruses/malware • Disk analysis and repair • Scan disk and look for faults • Prevent loss of data due to faulty disk • Auto-update • Checks Internet for new versions of software/OS • Downloads and installs without user interaction • Firewall • Examine ingoing and outgoing traffic • To help restrict/prevent unauthorised access • …over a network/external source	3 AO1 1a (1) AO1 1b (1) AO2 1b (1)	Must be appropriate to scenario. For encryption, no mark for 'it encrypts data' Do not award: any form of backup or device driver. Do not award: encryption stops data being stolen. Do not award: brand names. But read description. Mark program first. If incorrect 0 marks. If wording is not clear, or terminology not exact but it can be understood, marks can be awarded for description of use. Defragmentation – do not award marks for describing a fragmented disk this is a NAQ.

2015

4	a		• antivirus • firewall	2	
	b		e.g. • (User name and) password • Only allows you to use the system if you are authorised • Encryption • Prevents hackers from understanding any data if accessed (e.g. passwords) • Access rights • To prevent files from being modified/deleted • User access control • Prevents users from making changes to the system Marks in pairs	4	Accept any security measure that is provided by the operating system itself but not by standard utility programs (even if the utility program is normally bundled with operating systems). The first bullet is for identifying or a brief description of a measure. The second bullet is for a further more detailed description or a description of how the measure ensures security. Any reasonable biometrics is acceptable.

Extra questions

	b		Organise the use of (main) memory… …by converting logical addresses to physical addresses Allows programs to share memory / allocate memory… …& protect programs / data from each other Allows programs larger than main memory to run	3	**Examiner's Comments** Most candidates gave correct responses to this, with the majority of those gaining two marks, the most popular answers for this were 'allocates memory' and 'protect programs from each other'.

Question			Answer	Mark	Guidance
2	a	i	- Provide a (user) interface - Manage hardware/peripherals - ~~Manage CPU usage / handles interrupts~~ - Provide security - Provide platform to run other software - Provide utilities for system maintenance (1 Mark per -, Max 3)	3 (AO1.1)	If candidate names utility software, allow BP6