MODULE A SYSTEMS ARCHITECTURE · A1

What a computer system is and what the CPU does: mark scheme

~25 minutes · 20 marks · Cambridge 0478 syllabus 3.1.1(a)

How to use. Mark positively. "Any N from" means award one mark per point up to N. **//** separates alternative answers for the same mark. Words in (brackets) are not needed for the mark. Credit any other valid answer that shows the same understanding.

QUESTION	ANSWER	MARKS	GUIDANCE
1(a) 0478 3.1.1(a)	Central processing unit	**1**	All three words needed.
1(b) 0478 3.1.1(a)	Any **two** from: It processes instructions and data // it runs the kiosk's program ... that are input (e.g. the scanned ticket code) ... so that the result can be output (e.g. the map shown on the screen / the description played) It fetches, decodes and executes instructions	**2**	max 2. Do not accept "it stores the map images" or "it controls the computer" alone.
1(c) 0478 3.1.1(a)	Barcode scanner: Input Screen: Output Speaker: Output Hard disk drive: Storage	**4**	1 mark per correct row. More than one tick in a row: no mark for that row.
2(a) 0478 3.1.1(a)	Fetch-decode-execute cycle	**1**	More than one tick: 0.
2(b) 0478 3.1.1(a)	RAM // random access memory fetches decodes executes	**4**	1 mark per correct word. Accept "gets / retrieves" for fetches; "interprets" for decodes; "runs / carries out" for executes. Do not accept "ROM" or "storage" for the first blank.
3 0478 3.1.1(a)	Any **three** from: Fetch: an instruction is fetched from (main) memory / RAM Decode: the instruction is decoded // the CPU works out what the instruction means (by the control unit) Execute: the instruction is carried out The cycle repeats (for the next instruction)	**3**	max 3. Naming the three stages only, with no description, scores 1. Credit correct register/bus detail (taught in A3/A4) but it is not needed.

QUESTION	ANSWER	MARKS	GUIDANCE
4 0478 3.1.1(a)	Any **three** from: The scanner inputs the image (as data) The CPU processes the data (that has been input) ... by running / executing the instructions of the (scanning) program ... (fetching, decoding and executing them) ... so that the result / processed image can be output (to the monitor) Without the CPU the input data could not be processed // nothing would be output	**3**	max 3. Answer must be linked to the scenario for full marks. Do not accept "the CPU stores the invoice".
5 0478 3.1.1(a)	The CPU processes instructions and data. The CPU repeats the FDE cycle for each instruction in a program.	**2**	1 mark per correct tick. More than two ticks: 0.

Total: 20 marks