

2(a)	Program counter // PC
2(b)(i)	Any three from: • It sends control signals to other components • ... using the control bus • ... to manage the flow of data through the CPU • It decodes an instruction • ... using an instruction set
2(b)(ii)	Current instruction register // CIR
2(c)(i)	C
2(c)(ii)	One mark for example of storage One mark for example of what it will store • RAM • Data/programs/software/instructions that are currently in use • ROM • Startup instructions • BIOS • Bootstrap • Firmware • Virtual memory • Pages from RAM that are not immediately needed • Data/programs/software/instructions that are currently in use
2(d)	One mark for each correct storage type • Optical • Solid-state • Solid-state • Magnetic • Optical • Solid-state

1(a)	Any one from: • ROM • Cache
1(b)	Any one from: • It is volatile storage // Data is lost when the power is turned off. • It needs to be regularly replaced by other data // The data regularly changes // Data needs to be constantly updated
1(c)	• 10011 • 11100110
1(d)	• 0011 0101 • 1000 1010 1101
1(e)	One mark for each correct nibble (MAX 2) One mark for a correct method of working e.g. showing carries. <pre> 1 1 0 1 1 0 0 1 0 1 + 0 1 1 1 0 0 0 0 ----- 1 1 0 1 0 1 0 1 </pre>
1(f)	Any two from: • The result is greater than 255 // The result is too large. • Cannot be stored in 8 bits // Cannot be stored in the number of bits available for the register
1(g)	One mark for a correct working method e.g. flip and add One mark for correct answer 11101010

7(a)	Any two from e.g. – Barcode scanner – QR code scanner – Digital camera
7(b)	Any six from: – Proximity/infrared/pressure sensor used – Sensor continually sends digitised data to microprocessor // When driver pushes button, sensor sends digitised data to the microprocessor – Microprocessor compares data to stored value(s) – If in range/out of range/matches, microprocessor sends signal to close the door – Actuator used to close door – If not in range/out of range/does not match door will not close // – If not in range/out of range/does not match actuator not activated/signal not sent as passenger in door // – If not in range/out of range/does not match a timer is set to check again // – If not in range/out of range/does not match a signal is sent to alert the driver/output a message – This process repeats until the door can close