

1(a)	A
1(b)(i)	(000)11000
1(b)(ii)	(0)1100101
1(b)(iii)	19
1(b)(iv)	34
1(c)(i)	0101 0001
1(c)(ii)	1110 0011
1(c)(iii)	82
1(d)	One mark for correct method of working, for example flip and add 1 One mark for correct answer 11111011
1(e)(i)	A
1(e)(ii)	Any three from: • Microprocessor compares the value from the sensor to a stored value • If the values do not match, the microprocessor sends a signal to increase or decrease the temperature • If the values match, no action is taken
1(f)	Any two from: • It has a single/limited function • It is difficult to change its function // cannot be reprogrammed • It has dedicated hardware • It has a microprocessor

4(a)(i)	Infra-red/proximity
4(a)(ii)	Any three from: • Receive digital data continually from the sensor • Uses sensor data to calculate distance to person • Compares calculated/sensor data to stored data/1m • ... if data/comparison indicates person is within 1m, it sends signal to display welcome message on screen
4(b)	Any two from: • Dedicated function // special purpose device // not general purpose device • Dedicated hardware // by description, for example hardware is only used for ATM functions • Cannot be (easily) reprogrammed • Uses firmware • Contains microprocessor // does not have CPU
4(c)	1 mark for input, for example: • Microphone • Braille keyboard/pad 1 mark for output, for example: • Speaker

10(a)	Any two from: • The simulation of intelligent behaviours by computers • A collection of data and the rules for using that data • Has the ability to reason • Has the ability to learn/adapt
10(b)	Any five from: • The user will enter data into the interface // The user will plug the car into an interface // The user is given questions using the interface • The inference engine will decide which questions to ask • ... by using the previous answers given • The inference engine will decide on a diagnosis • ... by comparing the data/answers entered to the knowledge base and rule base • ... by calculating which option is most likely if there are multiple • The interface will output the diagnosis/result • The explanation system shows how the diagnosis was reached

2(a)	One mark for each correct part of the fee, in the correct order: – 17 – 70 (Correct fee \$17.70)
2(b)	One mark for each correct binary value: Register 1 – 00001110 Register 2 – 01100010

2(c)	One mark for each correct hexadecimal value, in the correct order. – A – 0 – 3 – D (Ticket number A03D)
2(d)	Two from: – It contains logic gates/switches ... – ... that process the values 1 and 0 // have two states
2(e)	Any four from: – Compares the ticket number received to stored data – ... that is a database/file of ticket numbers – ... checks the ticket number is listed as paid – If the data matches/cost is paid it sends a signal to raise the barrier – If the data does not match/cost is not paid, the barrier remains down