

7	One mark for each correct data transmission method. - Serial - Simplex Any three from: Serial - Data will need to travel long distances - One wire is used // <u>bits</u> are sent in order // sent one bit at a time - Less chance of data being skewed // less chance of error - Transmission speed would be adequate Simplex - Data only needs to be sent in one direction - Data does not need to be sent back from the speakers to the microphone
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4(a)(i)	Two from (one mark for serial, one mark for full-duplex): serial - Serial is suitable as data may be travelling a long distance (over 5 metres). - Serial is suitable to make sure that <u>bits</u> don't arrive skewed/arrives in order. - Serial is suitable as there is less chance of error. - Serial has sufficient transmission speed as not much data being sent. full-duplex - Full-duplex is suitable as data needs to go between customer and kitchen computer // data needs to go in both directions // so notification of errors can be sent back to customer.
4(a)(ii)	The data may be transmitted faster.
4(b)(i)	Any five from: - The checksum is calculated from/using the data. ... using an algorithm // by example. - The (checksum) value is transmitted with the data. - The (checksum) value is recalculated after transmission/by recipient. - If the checksum values do not match, an error is detected // If the checksum values match, no error is detected request for data to be resent if there is an error.
4(b)(ii)	Any one from: - Parity byte/block check - Echo check
4(c)(i)	D
4(c)(ii)	Any Two from: - The packets arrive in the wrong order. - Each packet could take a different route. - Some packets may take longer than others to be transmitted. - Some packets may not arrive/be corrupted and need to be requested again.

3(a)	Any two from: • It is easier to debug. • Less likely to make errors. • The program is machine independent/portable
3(b)(i)	One mark for each correct term in the correct place. • whole code • executing • all • line by line • error A compiler translates the whole code at once before executing it. A compiler produces an error report that displays all errors. An interpreter translates and executes the code line by line. An interpreter stops execution when an error is found and continues once it is corrected.
3(b)(ii)	One mark for each correct function. One mark for each correct matching role description. Examples: • Code editor • Allows the programmer to write/change the program. • Run-time environment • Allows the user to run the code and see the output. • Error diagnostics • Features that can be used to find errors in the code • Auto-completion • A programmer starts to type a command word, and the IDE suggests option for completing it. • Auto-correction • If a programmer misspells a command word it is changed to the correct spelling • Prettyprint • The command words/identifiers are given different colours
3(c)(i)	Any one from: • Inkjet • Laser

3(c)(ii)	One mark from: - Serial - Parallel One mark from: - Half-duplex - Full-duplex - Simplex Any four from (for descriptions matching transmission types given): serial - Serial would send <u>bits</u> in order // serial uses only one wire. ... so won't be skewed // less likely to have errors - Serial transmission speed would be adequate. parallel - Parallel would transmit data faster. ... as multiple <u>bits</u> are sent at the same time // ... as multiple wires are used. - For parallel, chance of skewing/errors would be low as short distance transmission only required. half/full duplex - To allow data to be sent in both directions ... so any interrupts/notifications for errors can be sent back to the computer. simplex - Data only needs to be sent one direction // Data transmission doesn't need to be two-way. ... as the printer may not need to send errors back to the computer
3(c)(iii)	- A <u>parity bit</u> is added to each byte. ... to make the number of 1s/0s even // that will be 1 if the number of 1s/0s is odd // that will be 0 if the number of 1s/0s is even. - The number of 1s/0s in each byte is counted after transmission. - If any bytes have an odd number of 1s/0s an error is detected