A-Level
COMPUTING

COMP2: Computer Components, the Stored Program Concept and the Internet
Mark scheme

2510
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Version/Stage: 1.1 Final

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts: alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Assessment Writer.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this Mark Scheme are available from aqa.org.uk

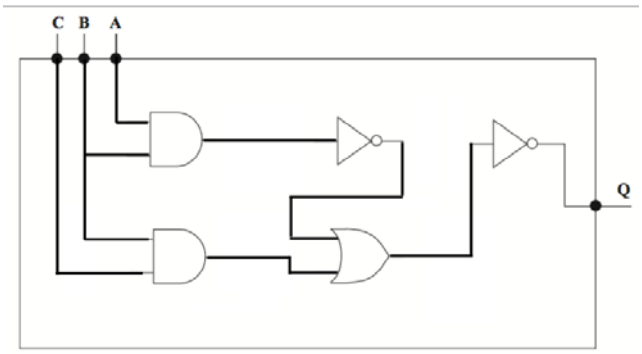
The following annotation is used in the mark scheme:

; - means a single mark
// - means alternative response
/ - means an alternative word or sub-phrase
A - means acceptable creditworthy answer
R - means reject answer as not creditworthy
NE - means not enough
I - means ignore
DPT - means "Don't penalise twice". In some questions a specific error made by a candidate, if repeated, could result in the loss of more than one mark. The **DPT** label indicates that this mistake should only result in a candidate losing one mark, on the first occasion that the error is made. Provided that the answer remains understandable, subsequent marks should be awarded as if the error was not being repeated'.

Qu	Part	Sub-part	Marking Guidance	Marks	Comments
1	**a**		1 special purpose (application software); **A.** specific purpose **R.** special (software)/specialist (software) 2 word processor // spreadsheet // presentation software/program // database; **A.** any other sensible answer **R.** (web) browser **R.** text editor 3 translator (software/program); **A**. translating/translation 4 utility (software/program); **R.** just trade name of a specific piece of software unless used as an example (ie MS Word)	**4**	
1	**b**	**i**	assembly (language); **A**. assembly code **R**. assembler	**1**	
1	**b**	**ii**	has to be translated into <u>machine code</u> // each assembly language instruction will be translated into <u>machine code</u> equivalent; by an assembler; **A.** converted for translated **A**. first generation for machine code	**2**	

1	**b**	**iii**	Because it does not have the same processor (type) // the instruction set is different // different architecture/platform; (Assembled / linked for a) different operating system; **NE.** operating software The program refers to a memory address that does not exist on this computer // relocatable code used but addressing system on new machine different; not enough memory space; required peripherals are not available; required <u>library</u> (code/program) missing;	**MAX 1**	

2	**a**		OR gate **Input A** / **Input B** / **Output** 0 / 0 / **0** 0 / 1 / **1** 1 / 0 / **1** 1 / 1 / **1** NAND gate **Input A** / **Input B** / **Output** 0 / 0 / **1** 0 / 1 / **1** 1 / 0 / **1** 1 / 1 / **0** One mark for correct output OR gate; One mark for correct output NAND gate;	**2**	

2	**b**		 One mark for inputs A and B connected to AND gate; One mark for inputs B and C connected to AND gate; One mark for output of AND (A,B input) as only connection going to NOT gate; One mark for output of NOT gate plus the AND gate (B,C input) going to OR gate; One mark OR gate as only connection going to NOT gate and output only connection to Q;	**5**	

2	**c**		**MAX 2 if working out is not logically sound** **Example 1:** $\overline{\overline{\mathbf{A}} + \overline{\mathbf{B}} + \mathbf{B}.\overline{\mathbf{A}}}$ $\mathbf{A}.\mathbf{B} + \mathbf{B}.\overline{\mathbf{A}}$ Having applied De Morgan's correctly; $\mathbf{B}.(\mathbf{A} + \overline{\mathbf{A}})$ Having factorised; Final answer: **B ;** **Example 2:** $\overline{\overline{\mathbf{A}} + \overline{\mathbf{B}} + \mathbf{B}.\overline{\mathbf{A}}}$ $\overline{(\overline{\mathbf{A}} + \overline{\mathbf{B}}).(\overline{\mathbf{B}} + \mathbf{A})}$ Having applied De Morgan's correctly; $\overline{\overline{\mathbf{A}}.\overline{\mathbf{B}} + \overline{\mathbf{A}}.\mathbf{A} + \overline{\mathbf{B}}.\overline{\mathbf{B}} + \overline{\mathbf{B}}.\mathbf{A}}$ Expanded bracket; $\overline{\overline{\mathbf{A}}.\overline{\mathbf{B}} + \mathbf{0} + \overline{\mathbf{B}} + \overline{\boldsymbol{B}}.\boldsymbol{A}}$ Simplified elements $\overline{\overline{\mathbf{A}}.\overline{\mathbf{B}} + \overline{\mathbf{B}}}$ Having used C + C.D = C to simplify $\overline{\overline{\mathbf{B}}}$ Having used C + C.D = C to simplify again **Final answer: B ;**	**3**	

			Truth Table Answer **A** | **B** | $\overline{\overline{A} + \overline{B}}$ | $B.\overline{A}$ | $\overline{\overline{A} + \overline{B}} + B.\overline{A}$ 0 | 0 | 0 | 0 | 0 0 | 1 | 0 | 1 | 1 1 | 0 | 0 | 0 | 0 1 | 1 | 1 | 0 | 1 | | **X** | **Y** | **Z** 1 mark for both columns marked X and Y above; (column X could be labelled **A.B**) 1 mark for final column Z; 1 mark for final answer: B;		

3	**a**		increase the number of bits that can be transferred <u>at one time</u> ; **A.** increase rate of data transfer; increases the number of (memory) addresses/ addressable locations // increase the maximum amount of primary store/memory (possible); instructions performed more quickly // instructions executed at faster rate // fetch execute cycle will happen faster // increased heat may cause malfunctioning of device // overheating; **A.** calculations/operations/commands for instructions	**3**	

3	**b**	**i**	a (hardware) device/component that is not part of the CPU; **NE.** processor/computer a (hardware) device not directly under the control of the processor/CPU; a device that communicates through an I/O controller; external hardware/device; **R**. examples alone	**MAX 1**	

3	**b**	**ii**	to allow exchange of data/instructions/signals between the processor and the peripheral; **A.** communicate **R.** information **NE**. To allow the device to be connected	**1**	

3	**b**	**iii**	Electronics that interface the controller to the system bus; Electronics appropriate for sending signals to the device connected to the computer;	**MAX 1**	

3	**b**	**iv**	Each peripheral operates in a different way; Not sensible to design a processor to control every possible peripheral; A new type of peripheral would require the processor to be redesigned; Peripherals may operate at a different voltage from the processor; Peripherals will usually operate at a slower rate than the processor (requiring buffering);	**MAX 2**	

4	**a**		Keyboard // keypad // concept keyboard // numberpad; Touch-screen; **R.** mouse	**2**	

4	**b**		A light source / laser is shone at bar code // a bar code is illuminated; **NE** beam/photons (moving) mirror/prism moves light beam across bar code // user moves reader across bar code // user moves the bar code across the reader; **NE** beam Light reflected back; Black/white bands reflect different amounts of light // black reflects less light // white reflects more light; Light sensor / photodiode / CCD (measures amount of reflected light); Light reflected converted into an electrical signal; **A** convert reflection to (binary) numbers / characters / ASCII **Check Digit:** The (12) data digits are passed through a function to calculate a check digit; The result is compared against the check digit read in // check digit compared to rest of bar code; If they do not match an error is indicated; If they match the bar code is accepted and processed; **Mark Bands and Description** 5-6: *To achieve a mark in this band, candidates must meet the subject criterion (SUB) and all 5 of the quality of language criteria (QWCx).*	**MAX 6**	

					SUB Candidate has made at least five subject-related points. Candidate has made valid points about both scanning **and the check digit** in their answer. *QWC1* Text is legible. *QWC2* There are few, if any, errors of spelling, punctuation and grammar. Meaning is clear. *QWC3* The candidate has selected and used a form and style of writing appropriate to the purpose and has expressed ideas clearly and fluently. *QWC4* Sentences (and paragraphs) follow on from one another clearly and coherently. *QWC5* Appropriate specialist vocabulary has been used.		
				3-4	*To achieve a mark in this band, candidates must meet the subject criterion (SUB) and 4 of the 5 quality of language criteria (QWCx).* *SUB* Candidate has made at least three subject-related points. *QWC1* Text is legible. *QWC2* There may be occasional errors of spelling, punctuation and grammar. Meaning is clear. *QWC3* The candidate has, in the main, used a form and style of writing appropriate to the purpose, with occasional lapses. The candidate has expressed ideas clearly and reasonably fluently. *QWC4* The candidate has used well-linked sentences (and paragraphs). *QWC5* Appropriate specialist vocabulary has been used.		
				1-2	*To achieve a mark in this band, candidates must meet the subject criterion (SUB) and 4 of the 5 quality of language criteria (QWCx).* *SUB* Candidate has made at least one subject-related point. *QWC1* Most of the text is legible. *QWC2* There may be some errors of spelling, punctuation and grammar but it should still be possible to understand most of the		

			response. *QWC3* The candidate has used a form and style of writing which has many deficiencies. Ideas are not always clearly expressed. *QWC4* Sentences (and paragraphs) may not always be well-connected. *QWC5* Specialist vocabulary has been used inappropriately or not at all. 0 Candidate has made no relevant points. Note: Even if English is perfect, candidates can only get marks for the points made at the top of the mark scheme for this question. If a candidate meets the subject criterion in a band but does not meet the quality of language criteria then drop mark by one band, providing that at least 4 of the quality of language criteria are met in the lower band. If 4 criteria are not met then drop by two bands.		

5	**a**	**i**	**A** the protocol to be used // secure hyper-text transfer protocol // hyper-text transfer protocol secure; **NE.** hyper-text transfer protocol **B** the FQDN // fully qualified domain name; **A.** the address of (AQA's) web server **C** the path and resource to be returned; **A.** path / pathname / file path	**3**	

5	**a**	**ii**	uk // .uk ;	**1**	

5	**b**	**i**	To take a required FQDN and to return an IP address; To link/map a FQDN to an IP address; **A.** domain name for FQDN **R.** URL	**1**	

5	**b**	**ii**	The (local) computer already has a copy of the needed IP address (in a hosts file); The (local) computer has a cache of recent DNS queries / answered DNS queries; **A.** previously visited site / refreshing a page; The URL typed in already contains an IP address; The URL refers to a local resource, e.g., a file on the local computer // localhost ; **NE.** intranet	**MAX 2**	

5	**c**	**i**	application (layer); **A.** fourth layer;	**1**	

5	**c**	**ii**	To fetch different parts of the web page that also include a URL; To fetch a needed image / video / javascript / css / resource; **R.** transmission error **R.** network busy	**MAX 1**	

5	**c**	**iii**	Port that is temporarily assigned / only exists for duration of a connection; Port number automatically allocated // assigned from the TCP/IP stack; **A**. a port number in range 1024 - 65535	**MAX 1**	

6	**a**		**Correct answer:**
			
			`<a href = "http://www.aqa.org.uk">Click me to go to AQA</a>`
			
			Mark as:
			
			`<a>` and `</a>`;
			
			`href = http://www.aqa.org.uk //`
			`href = "http://www.aqa.org.uk"`
			(inside an opening tag);
			
			`Click me to go to AQA`
			(between opening and closing tags);
			NOTE - not inside a tag
			
			I. apostrophes / speech marks
			A. https for http
				3	

6	**b**		Segment 1 will be a bulleted list Segment 2 items will be numbered For stating both points – ONE mark;	**1**	

6	**c**		 One mark for the text ‘on the mat’ being larger (and bold); One mark for the line breaks and gap before and after the text ‘on the mat’;	**2**	

6	**d**		One mark for placing the missing `</title>` tag in the correct place; `<title>Welcome to The Local History Society </title>`	**1**	

6	**e**		Setting the maximum width of the page to a size relevant to the device / smaller; Making images smaller/resized with relation to screen size; Using font size relative to the screen size // em measurements // relative to a default font size // using percentage font sizes; **A.** make the font size/text bigger; Minimizing the amount of horizontal scrolling; Minimizing the amount of zooming in / out; Not loading/displaying large images; Using higher contrast colours; Making buttons/links bigger (relative to screen size); Having a different style sheet (that is used when the page is accessed by a mobile device); Using text stubs with links to display more content; move content into one long column; collapse menu links into drop down control; use of @media queries; use of percentage widths for layout control;	**MAX 2**	

7	**a**		**1** ; 4 ; 3 ;	**3**	

7	**b**	**i**	Optical Character Recognition;	**1**	

7	**b**	**ii**	Data that can (uniquely) identify a living person;	**1**	

7	**b**	**iii**	*Linked to context:* **(MAX 2)** Data could be used to track location (and activities) of a person; Data links a person to a specific location and car at a (specific) time; Number plates might not be recognised accurately (suggesting, incorrectly, a car was at a particular location); *General points:* **(MAX 1)**	**MAX 2**	

			Concern over security of data storage // security of data might be at risk; Selling on of data; Data used for marketing // unwanted phone calls;		