



## **General Certificate of Education**

# **Computing 6511**

**CPT 1      Computer Systems,  
Programming and Networking  
Concepts**

## **Mark Scheme**

*2008 examination - June series*

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

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' 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.

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Qu	Part	Sub Part	Marking Guidance	Marks
1			<p>1. system(s) (software) ;  2. general purpose (software) ; <b>R.</b> generic</p> <p>3. library (program/software) ;  4. utility (software) ; <b>R.</b> maintenance / system tools  5. translator (software) ; <b>A.</b> translation  6. compiler ;  7. accounting software / route planner / games /web page design  anything reasonable ... ;  <b>A.</b> web browser  <b>A.</b> good description (followed by a brand name)</p> <p><b>R.</b> DTP / Graphics /Presentation /firewall / anti-virus  <b>R.</b> Bespoke (only)  <b>R.</b> not specific e.g. ‘bank program’/’learning difficulties program”</p>	7
2	(a)		<p>Text / scene / code / object <u>editor</u> ;  <b>A.</b> Word processor  <b>A.</b> form/screen for <u>text/code entry/input/write</u></p>	1
2	(b)		<p>Translates (<b>A.</b> converts/changes) program code/source program; from high level language; into machine code/object code ;  <b>R.</b> binary  Checks the program code/statements for errors ;  If no errors found the executable file is generated ;  <b>T/O -1 Mark</b> if the explanation includes ‘executing the machine code’</p> <p>error report/list ; <b>A.</b> error message(s) <b>R.</b> error (only)  an intermediate (object) file ;  <b>A.</b> a copy of the source code ;</p>	<p><b>MAX</b> 2</p> <p>1</p>
2	(c)		<p>Interpreter software translates/checks/reads the program code one statement at a time (<b>A.</b> line by line) ;  Checks the statement for the correct syntax ;  If no errors found, interpreter recognises the statement ;  Interpreter calls a procedure to execute the statement ;  <b>A.</b> if no error found, that statement is executed ;</p> <p>If an error is found, program execution is halted (and the error reported) ;  The program runs until an error is found ;</p>	<b>MAX</b> 2
2	(d)	(i)	<p>Interpreter should allow for faster program development / faster error correction / errors easier to identify ;  <b>A.</b> easier to debug</p>	1
2	(d)	(ii)	<p>Compiler/source code will not be needed in order to distribute the final executable code / the exe code (alone) can be distributed to others;</p>	

			the exe code ( <b>A.</b> the program) will execute (run) faster ; the exe code/ the program cannot be changed (by others) ;	<b>MAX</b> <b>1</b>																																																
3	(a)		acknowledge data received by the printer ; error (signal) ; busy / free / ready / 'status' / acknowledge / strobe / off-line / powered / switched off / out of paper ; <b>A.</b> ground / earth / return; <b>R.</b> Interrupt / clock	<b>MAX</b> <b>1</b>																																																
3	(b)	(i)	110 1010 ;	<b>1</b>																																																
3	(b)	(ii)	0110 1010 ;	<b>1</b>																																																
3	(b)	(iii)	<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <table style="border-collapse: collapse; text-align: center;"> <tr><td>8</td><td><b>0</b></td></tr> <tr><td>7</td><td><b>0</b></td></tr> <tr><td>6</td><td><b>1</b></td></tr> <tr><td>5</td><td><b>0</b></td></tr> <tr><td>4</td><td><b>1</b></td></tr> <tr><td>3</td><td><b>0</b></td></tr> <tr><td>2</td><td><b>1</b></td></tr> <tr><td>1</td><td><b>1</b></td></tr> </table> <div style="text-align: center;"><b>A</b></div> <table style="border-collapse: collapse; text-align: center;"> <tr><td>8</td><td><b>0</b></td></tr> <tr><td>7</td><td><b>1</b></td></tr> <tr><td>6</td><td><b>0</b></td></tr> <tr><td>5</td><td><b>1</b></td></tr> <tr><td>4</td><td><b>0</b></td></tr> <tr><td>3</td><td><b>1</b></td></tr> <tr><td>2</td><td><b>1</b></td></tr> <tr><td>1</td><td><b>0</b></td></tr> </table> <div style="text-align: center;"><b>B</b></div> <table style="border-collapse: collapse; text-align: center;"> <tr><td>8</td><td><b>0</b></td></tr> <tr><td>7</td><td><b>1</b></td></tr> <tr><td>6</td><td><b>1</b></td></tr> <tr><td>5</td><td><b>0</b></td></tr> <tr><td>4</td><td><b>1</b></td></tr> <tr><td>3</td><td><b>0</b></td></tr> <tr><td>2</td><td><b>1</b></td></tr> <tr><td>1</td><td><b>0</b></td></tr> </table> <div style="text-align: center;"><b>C</b></div> </div> <p>8 parallel bits ; (above, below or between the lines) pattern A score 2 ; pattern B scores 2 ; pattern C scores 1 ;</p>	8	<b>0</b>	7	<b>0</b>	6	<b>1</b>	5	<b>0</b>	4	<b>1</b>	3	<b>0</b>	2	<b>1</b>	1	<b>1</b>	8	<b>0</b>	7	<b>1</b>	6	<b>0</b>	5	<b>1</b>	4	<b>0</b>	3	<b>1</b>	2	<b>1</b>	1	<b>0</b>	8	<b>0</b>	7	<b>1</b>	6	<b>1</b>	5	<b>0</b>	4	<b>1</b>	3	<b>0</b>	2	<b>1</b>	1	<b>0</b>	<b>MAX</b> <b>3</b>
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3	(c)	(i)	set of <u>rules</u> (about the way devices communicate) ; <b>A.</b> standards <b>R.</b> Instructions	<b>1</b>																																																
3	(c)	(ii)	sending <u>signals</u> between devices + implication of 2-way ; test to see if the device is ready to receive / 'are you ready?'; inform device that the data has been sent / 'here it is ...' ; receiver informs the sender that the data has been received / acknowledge that a transfer is completed;	<b>MAX</b> <b>2</b>																																																
3	(d)	(i)	Universal Serial Bus ;	<b>1</b>																																																
3	(d)	(ii)	Line 1 used with 7/8 bits shown (above or below); Correct code <b>0110 1010</b> ;	<b>2</b>																																																

3	(d)	(iii)	The number of bits transferred per sec / per unit of time ; <b>I.</b> speed <b>A.</b> frequency at which bits are transmitted	<b>1</b>
4	(a)		(memory) address / location ; <b>R.</b> Line number	<b>1</b>
4	(b)		second (generation) //assembly language/code/program // 2 / 2 <sup>nd</sup> ;	<b>1</b>
4	(c)	(i)	assembler ; <b>R.</b> assembly	<b>1</b>
4	(c)	(ii)	error list / error report / error count / <b>A</b> error message / highlight statement(s) illegally formed / instruction count // symbol table ; <b>R.</b> error	<b>1</b>
4	(d)		program (instructions are) transferred from backing store to main memory ; program consists of a sequence of instructions ; stored in a (continuous area of) <u>main memory</u> ; an <u>instruction</u> is fetched (and decoded) ; and then <u>instruction</u> executed (by the processor) ; program can be replaced by another program at any time ; program instructions are treated as data ;	<b>MAX</b> <b>4</b>
5	(a)	(i)	IP address / Internet Protocol Address;	<b>1</b>
5	(a)	(ii)	Uniform Resource Locator ; <b>A.</b> Universal Resource Locator	<b>1</b>
5	(b)		<ul style="list-style-type: none"> <li>• Forwards / backwards / Navigation - move to a previously viewed page ;</li> <li>• Favourites/Bookmarks - setting up/organising/stores regularly visited sites ;</li> <li>• Options/Tools/Settings - setting up of the Home page / enable/disable features e.g. run JavaScript ;</li> <li>• Home - move to the Home page ;</li> <li>• Refresh - refresh the current page ;</li> <li>• Stop - stop loading the current page / download ;</li> <li>• History – show a list of the last (say) 20 pages displayed ;</li> <li>• Security - change settings / e.g. enable/disable graphics/pop-ups/other content/plugin-ins ;</li> <li>• View HTML - source (code) ;</li> <li>• Address bar - allows the entering of a URL/IP/web address ;</li> </ul>	

			<ul style="list-style-type: none"> <li>• Search bar – search list for specific web site ;</li> <li>• RSS feeds – receiving content news/updates ;</li> <li>• Application launcher icon e.g. to run email client application ;</li> </ul> <p><b>R.</b> HTML editor  <b>Feature followed by NO description scores 0</b>  <b>Good description with feature implied scores 1</b></p>	<b>MAX 2</b>
5	(c)	(i)	footyhosting.co.uk	<b>1</b>
5	(c)	(ii)	(Each hosted club has) a (sub) <u>folder/directory</u> containing the files for their site ;	<b>1</b>
5	(d)		128 kbps // 2Mbps // 128 kbps AND 2Mbps; <b>R.</b> answers where in addition any other answer is circled	<b>1</b>
5	(e)	(i)	(magnetic/server) <u>hard disk</u> / hard drive ; <b>R.</b> removable hard disk <b>A.</b> ‘disk’ spelt as ‘disc’	<b>1</b>
5	(e)	(ii)	8000 GB ;	<b>1</b>
6	(a)	(i)	Picture element // <u>smallest</u> resolvable/rectangular area/unit ( <b>A.</b> <u>smallest</u> dot) which can be drawn on screen // smallest addressable part/unit of a picture ; smallest unit which is mapped to memory ;	<b>1</b>
6	(a)	(ii)	Pixels are stored as <u>numbers</u> /bit patterns ( <b>A.</b> values) which represent different <u>colours</u> ; <b>A.</b> or by example;	<b>1</b>
6	(b)		1 ;	<b>1</b>
6	(c)		(picture / image) width ; (picture / image) height ; <b>A.</b> (picture / image) dimensions <b>R.</b> size image resolution / colour depth / No. of bits per pixel ; colour palette / No. of colours in image; offset to the start of image data ; compression type ;	<b>Max 2</b>
6	(d)	(i)	loop counter / (loop) control variable // array subscript/index ; <u>array of Byte</u> ; <b>A.</b> <u>array of Integer</u>	<b>2</b>

6	(d)	(ii)	1101 ; I. any additional leading 0's	1
6	(e)	(i)	ThisWidth ; X ;	2
6	(e)	(ii)	<u>2-dimensional array</u> (of Byte) ;	1

6	(f)														
	ThisWidth	ThisHeight	Counter	X	Y	ThisByte		Final							
	8	5	0	1	1	255	[0]	25							
					2	255	[1]	96							
					3	255	[2]	96							
					4	255	[3]	24							
					5	255	[4]	24							
					6	255	[5]	113							
					7	255	[6]								
					8	255	[7]								
				2	1	255	[8]								
					2	25	[9]								
			1		3	25	[10]								
			2		4	96	[11]								
			3		5	96	[12]								
			4		6	24	[13]								
		5		7	24	[14]									
		6		8	113	[15]									

	<p>Mark as follows:                  Counter has incremented from 0 to 6 (only) ;                  X variable has incremented 1 and 2 (only) ;                  Y variable has incremented 1-8 (only) <u>at least once</u> ;                  ThisByte contains first ten correct values ;                  Final [0] contains 25 ;                  Final [1] to Final [5] are correct and with no other array subscripts used ;</p> <p>A. correct <u>six</u> values (only) in Final array ( in consecutive but wrong positions)</p>		<b>MAX 6</b>	
6	(g)	(i)	<p>program / constant / module / unit / user defined type / label / object / component / control / class ;</p> <p>A. ‘control’ by example e.g. text box, drop down list                  A. any elements which are SQL specific</p>	<b>1</b>
6	(g)	(ii)	<p>Maximum number of characters ;</p> <p><u>No</u> punctuation characters ;</p> <p><u>No</u> use of reserved words ;</p> <p>Must <u>not</u> start with a digit character ;                  case critical e.g. must start with lower case character ;</p> <p><i>A. any answer which describes ‘general’ programming language restrictions.</i></p> <p>identifier names must be unique ;                  free-format not allowed for certain constructs, e.g. statement must not spread over two lines ;                  restrictions on identifiers used for labels ;                  loop control variable must be ordinal/integer ;                  array index range is restricted ;                  all variables must be pre-declared ;</p>	<b>MAX 2</b>