

Cambridge International AS & A Level

COMPUTER SCIENCE 9608/13
Paper 1 Theory Fundamentals October/November 2021
MARK SCHEME

Maximum Mark: 75

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the October/November 2021 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

Cambridge International AS & A Level – Mark Scheme PUBLISHED

Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always whole marks (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit
 is given for valid answers which go beyond the scope of the syllabus and mark scheme,
 referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently, e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

© UCLES 2021 Page 2 of 9

Question				Answer				Marks
1(a)	1 mark for work 1 mark for correct 11001011 00110100 flip b 00110101 add 32 + 16 + 4 + 1 Answer: -53	ect answe	r					2
1(b)	AD							1
1(c)	0001 0111 010	1 0011						1
1(d)	 1 mark per bulle Any scenario wi Electronic control Date and tine Financial and tine Identification Barcodes (Interpretable) 	here a sin calculator me stored oplications n of latitud	gle digit n displays in BIOS o	of PCs or (games cor	nsoles	nitted	2
1(e)	1 mark for three 2 mark for all co	olumns co	rrect				1	2
	character ASCII denary value	W 87	A 65	N 78	D 68	S 83		
	ASCII denary value + 3	90	68	81	71	86		
	Encrypted character	Z	D	Q	G	V		

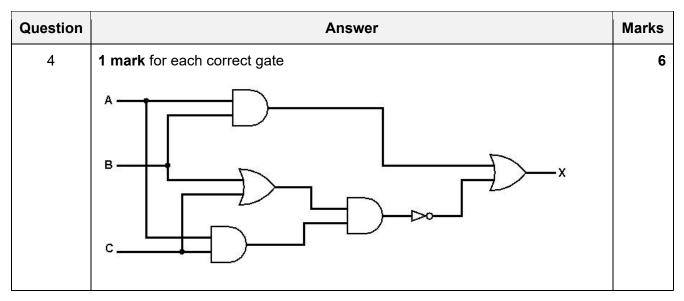
Question	Answer	Marks
2(a)(i)	44.1 kHz = 44 100 samples/measurements <u>per second/unit of time</u>	1
2(a)(ii)	16 bits are used to store each sample	1

© UCLES 2021 Page 3 of 9

Question	Answer	Marks
2(b)	1 mark per bullet point to max 4	4
	 Uses switches and circuits to translate keystrokes into signals the computer can understand The key matrix is a grid of circuits / three layers of plastic underneath the keys Each circuit is broken beneath the key / middle layer contains holes When key pressed, a circuit is made / completed and a signal is sent The (keyboard) processor compares location of signal from key matrix to a character map stored on ROM A character code for each key press is saved in a keyboard buffer 	

Question	Answer	Marks
3(a)	1 mark per bullet point to max 2 for each, max 4	4
	 Public is assigned by an ISP Public IP addresses can be accessed by anyone using the Internet Public is used to get internet service Public IP addresses must be unique throughout the Internet Private is assigned by a router Private IP addresses cannot be accessed by anyone using the Internet Private is used to communicate within a network Private can be duplicated in different networks // private addresses are unique only within the (local) network 	
3(b)	1 mark for each correct entry The user enters the Uniform Resource Locator (URL) into the address bar of the (web) browser. The domain name is taken from the URL and sent to a Domain Name Service (DNS). This stores an index/a list/a table of domain names and their matching IP addresses. If it finds the domain name, it sends the IP address to the (web) browser. If it does not find the domain name, it sends the request to a higher level/another DNS.	4

© UCLES 2021 Page 4 of 9



Question		Answer		Marks	
5(a)		t point to max 5 e <u>address</u> of the <u>next</u> instruction in the PC is incremented		5	
	 MDR holds t the addres The instructi CIR holds th instruction 	MAR points to the memory location to be accessed MDR holds the data read from /to be written tothe address pointed to by the MAR The instruction from the MDR is copied to the CIR CIR holds the current instructioninstruction in CIR is decoded			
5(b)	The ALU is and logic co The system	and logic comparisons.			
5(c)	1 mark for each	correct group		5	
	Instruction	Instruction group			
	LDM #12	Data movement			
	ADD 21	Arithmetic Operations			
	STO 21	Data Movement			
	CMP 21	Compare Instructions			
	JPE 01	Unconditional and Conditional Jump			

© UCLES 2021 Page 5 of 9

Question	Answer	Marks
5(d)	1 mark per bullet point	2
	 In the first pass the symbol table is generated. In the second pass the program is converted into machine code. 	

Question	Answer		
6	1 mark for each correct entry		
	Utility software Description		
	Disk formatter	Initialise a disk for first use// Reformat a previously used disk// Partition a hard drive	
	File compression	Reduce the size of the file	
	Defragmenter	Find files that are not stored in contiguous blocks and move them together	
	Backup	Making a copy of data in case of loss	

Question		Ansv	ver		Marks
7(a)	1 mark first two rows and 1 mark third row.			2	
	Measure	Data verification	Data validation		
	Parity check	✓			
	Double entry	✓			
	Format check		✓		
7(b)	1 mark from:				1
	ChecksumVisual checkEcho checkARQ				

© UCLES 2021 Page 6 of 9

Question	Answer	Marks
7(c)	1 mark from:	1
	 Presence check Existence check // uniqueness check Length check Range/Limit check Type/character check Consistency check 	

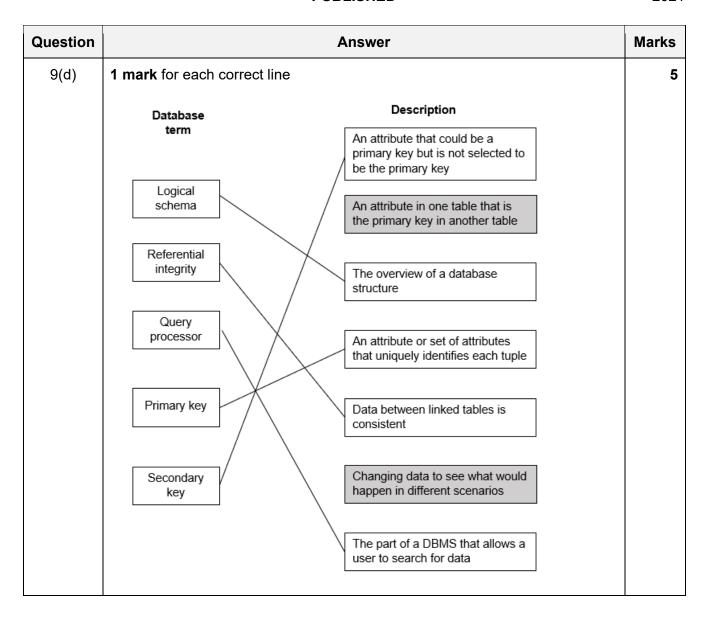
Question	Answer	Marks
8(a)	1 mark per bullet point to max 4	4
	 Frame is made up of pixels // is a single image Each pixel has a binary value for its colour Consecutive pixels with the same value/binary value/colour are stored as a single data value and a count Accept a sensible example 	
8(b)	1 mark per bullet point to max 2	2
	Reduce colour/bit depthReduce image resolution	

Question	Answer	Marks
9(a)	1 mark per bullet point to max 2	2
	 Access rights manage the actions people can perform on parts of the database users have access to 	
	Using viewspeople can only see certain fields/tables	
	 Put bank details in a different table …limit access to that table 	
9(b)(i)	1 mark per correct bullet point	4
	• SELECT SupName, SupPhone, SupContactName, NumberInStock	
	• FROM SUPPLIER, STOCK	
	• WHERE StockId = 'D930'	
	• AND SUPPLIER.SupId = STOCK.SupId;	

© UCLES 2021 Page 7 of 9

Question	Answer	Marks
9(b)(ii)	1 mark per bullet point	2
	• ALTER TABLE STOCK • ADD StockPrice REAL;	
9(c)	1 mark per bullet point to max 6	6
	For example:	
	Table names to identify the tables	
	 Foreign keys to link tables // to create relationships between tables 	
	 Data types to prevent the wrong data type being entered in a field 	
	Passwords to allow access only to authorised personnel	
	Access rights for different levels of access	

© UCLES 2021 Page 8 of 9



© UCLES 2021 Page 9 of 9