

Cambridge International Examinations

Cambridge International General Certificate of Secondary Education

CANDIDATE NAME					
CENTRE NUMBER			NDIDATE MBER		

COMPUTER SCIENCE

0478/12

Paper 1 Theory

February/March 2018

1 hour 45 minutes

Candidates answer on the Question Paper.

No Additional Materials are required.

No calculators allowed.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name in the spaces at the top of this page.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams, graphs or rough working.

Do not use staples, paper clips, glue or correction fluid.

DO NOT WRITE IN ANY BARCODES.

Answer all questions.

No marks will be awarded for using brand names of software packages or hardware.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [] at the end of each question or part question.

The maximum number of marks is 75.

This syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.



[3]

1 Some types of software can be described as free software or freeware.

Draw lines to link each description to a correct type of software. A description can be linked to more than one type of software.

	Description	Type of software	
	Free to download		
		Free software	
	Code can be modified and redistributed		
	Todiotiloatoa	Freeware	
	Subject to copyright legislation		
		[2	2]
Dav	rid has installed anti-virus software	n his computer.	
(a)	State three tasks carried out by a	i-virus software.	
	Task 1		
	Task 2		

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2

(b)	David is still conce	erned that his compute	er might get infected l	by a computer virus.	
	State three other virus.	ways in which David c	an reduce the risk of	his computer getting a	a computer
	1				
	3				
					[3]
Par	ity checks can be ι	used to check for error	s during data transmi	ssion.	
	•	used to check for error been transmitted incor	•	ssion.	
One	•		•	Byte 4	
One	e of the bytes has t	peen transmitted incor	rectly.		
One	e of the bytes has bette 1	Byte 2	Byte 3 10110100	Byte 4	
One By	e of the bytes has bette 1	Byte 2 10101000 was incorrectly transm	Byte 3 10110100 itted.	Byte 4	[1]
By 10 (a)	te 1 110011 State which byte	Byte 2 10101000 was incorrectly transm	Byte 3 10110100 itted.	Byte 4 10110101	[1]
One By	e of the bytes has bette 1 110011 State which byte was bette and the state which byte was better the state which between the state was better the state which between the state which between the state which between the state was between the state which b	Byte 2 10101000 was incorrectly transm	Byte 3 10110100 itted. y transmitted byte.	Byte 4 10110101	[1]
By 10 (a)	e of the bytes has bette 1 110011 State which byte was bette and the state which byte was better the state which between the state was better the state which between the state which between the state which between the state was between the state which b	Byte 2 10101000 was incorrectly transm	Byte 3 10110100 itted. y transmitted byte.	Byte 4 10110101	[1]
By 10 (a)	e of the bytes has bette 1 110011 State which byte was bette and the state which byte was better the state which between the state was better the state which between the state which between the state which between the state was between the state which b	Byte 2 10101000 was incorrectly transm	Byte 3 10110100 itted. y transmitted byte.	Byte 4 10110101	[1]
By 10 (a)	e of the bytes has bette 1 110011 State which byte was bette and the state which byte was better the state which between the state was better the state which between the state which between the state which between the state was between the state which b	Byte 2 10101000 was incorrectly transm	Byte 3 10110100 itted. y transmitted byte.	Byte 4 10110101	[1]
By 10 (a)	e of the bytes has bette 1 110011 State which byte was bette and the state which byte was better the state which between the state was better the state which between the state which between the state which between the state was between the state which b	Byte 2 10101000 was incorrectly transm	Byte 3 10110100 itted. y transmitted byte.	Byte 4 10110101	[1]
By 10 (a)	e of the bytes has bette 1 110011 State which byte was bette and the state which byte was better the state which between the state was better the state which between the state which between the state which between the state was between the state which b	Byte 2 10101000 was incorrectly transm	Byte 3 10110100 itted. y transmitted byte.	Byte 4 10110101	[1]

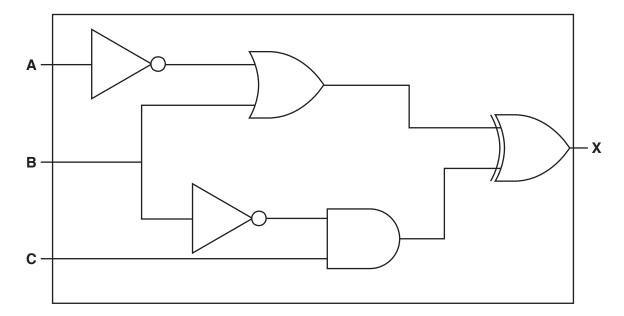
3

The	The air conditioning system uses temperature sensors and a microprocessor. The temperature must remain between 21 °C and 24 °C.							
The								
Desc		sors and the microprod	cessor are used to cor	ntrol the temperature	of th			
The		nputer is stored as a se						
	IP address of a cor		et of four 8-bit binary nu	ımbers.				
The (a)	IP address of a cornetwork administra	nputer is stored as a se	et of four 8-bit binary nursy number into hexaded	ımbers. simal.				
The	IP address of a cornetwork administra	nputer is stored as a set tor converts each binare to show the hexadecir	et of four 8-bit binary nursy number into hexaded	ımbers. simal.				
The	IP address of a cornetwork administra Complete the table The first number ha	nputer is stored as a set tor converts each binare to show the hexadecir	et of four 8-bit binary nursy number into hexaded	ımbers. simal.				
The (a)	IP address of a cornetwork administra Complete the table The first number has Binary IP address	mputer is stored as a se tor converts each binar to show the hexadecir as already been conver	et of four 8-bit binary nursy number into hexaded nal equivalent of the birted.	imbers. simal. nary IP address.				
The (a)	IP address of a cornetwork administra Complete the table The first number has Binary IP address 11000100	mputer is stored as a se tor converts each binar to show the hexadecir as already been conver	et of four 8-bit binary nursy number into hexaded nal equivalent of the birted.	imbers. simal. nary IP address.				
The (a)	IP address of a cornetwork administra Complete the table The first number has Binary IP address 11000100 Hexadecimal	mputer is stored as a se tor converts each binar to show the hexadecir as already been conver	et of four 8-bit binary nursy number into hexaded nal equivalent of the birted.	imbers. simal. nary IP address.				
The (a)	IP address of a cornetwork administra Complete the table The first number has Binary IP address 11000100 Hexadecimal C4	mputer is stored as a se tor converts each binar to show the hexadecir as already been conver	et of four 8-bit binary nursy number into hexaded nal equivalent of the binated.	imbers. simal. nary IP address.				
The (a)	IP address of a cornetwork administra Complete the table The first number has Binary IP address 11000100 Hexadecimal C4	mputer is stored as a set tor converts each binare to show the hexadecir as already been conver	et of four 8-bit binary nursy number into hexaded nal equivalent of the binated.	imbers. simal. nary IP address.				
The (a)	IP address of a cornetwork administra Complete the table The first number has Binary IP address 11000100 Hexadecimal C4	mputer is stored as a set tor converts each binare to show the hexadecir as already been conver	et of four 8-bit binary nursy number into hexaded nal equivalent of the binated.	imbers. simal. nary IP address.				
The (a)	IP address of a cornetwork administra Complete the table The first number has Binary IP address 11000100 Hexadecimal C4	mputer is stored as a set tor converts each binare to show the hexadecir as already been conver	et of four 8-bit binary nursy number into hexaded nal equivalent of the binated.	imbers. simal. nary IP address.				

6

Primary, secondary and off-line are types of storage.	
Give an example of each type of storage.	
For each example state how it is used.	
Primary storage	
Example	
Use	
Secondary storage	
Example	
Use	
Off-line storage	
Example	
Use	
	[61

7 (a) For this logic circuit:



Complete the truth table.

Α	В	С	Working space	х
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

[4]

(b) For this logic statement:

X = 1 if (B is 1 OR C is NOT 1) AND ((A is NOT 1) AND (B is 1 OR C is 1))

Draw a logic circuit.



(c) Complete the truth table for the logic statement given in part (b).

Α	В	С	Working space	х
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

[4]

8 (a) Three descriptions and two methods of data transmission are given.

Tick (\checkmark) the correct box to show the **Method** of data transmission for each description.

Description	Met	hod
	Serial	Parallel
Multiple bits are sent and received at the same time.		
Bits are sent one at a time in a single direction.		
Bits are sent using a single wire. Data can be sent or received, but not at the same time.		

[3]

(b) Three descriptions and three types of data transmission are given.

Tick (\checkmark) the correct box to show the **Type** of data transmission for each description.

Description		Туре	
	Simplex	Half-duplex	Duplex
Multiple bits are sent and received at the same time.			
Bits are sent one at a time in a single direction.			
Bits are sent using a single wire. Data can be sent or received, but not at the same time.			

[3]

9	A 32-second sou	nd clip will be reco	orded. The sound will be sampled 16000 times a second.				
	Each sample will	be stored using 8	bits.				
	Calculate the file	size in kilobytes.	You must show all of your working.				
	calculate the file of the mast energy and the mast energy and the mast energy and the mast energy are the mast energy and the mast energy are the mast energy and the mast energy are the						
	File Oine		L.D.				
	File Size		kB [(3]			
10	The table shows	a segment of prim	nary memory from a Von Neumann model computer.				
	Address	Contents					
	10001	11001101					
	10010	11110001					
	10011	10101111					
	10100	10000110					
	10101	00011001					
	10110	10101100					
	The program cou	unter contains the	data 10010				
	(a) (i) State th	ie data that will be	placed in the memory address register (MAR).				
			[1]			
	(ii) State th	ne data that will be	placed in the memory data register (MDR).				
			[1]			
				-			

	(b)	Describe the stored program concept when applied to the Von Neumann model.
		[4]
11	Miri	am needs to use a large high-resolution photo as a thumbnail image on a website.
	She	will use lossy compression to reduce the file size of the photo to create the thumbnail image.
	(a)	State why a smaller file size is appropriate for this situation.
	()	and many at a manage may appropriate to the analysis
		[1]
	(b)	Explain how lossy compression reduces the file size.
		[4]

12 A hospital stores the results of medical tests on a computer system. Each patient is given a wristband containing a unique barcode. The barcode is used every time the patient has a medical

iesi.	•	
(a)	Explain two benefits of using barcodes in this situation.	
	Benefit 1	
	Benefit 2	
		[4]
(b)	Describe how the barcode is read.	
		[4]

13	State four functions of an operating system.	
	Function 1	
	Function 2	
	Function 3	
	Function 4	
		 [4

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