Surname	Centre Number	Candidate Number
First name(s)		0

GCSE



C500U10-1





MONDAY, 2 NOVEMBER 2020 – AFTERNOON

COMPUTER SCIENCE – Component 1 Understanding Computer Science

1 hour 45 minutes

For Ex	aminer's us	e only
Question	Maximum Mark	Mark Awarded
1.	5	
2.	6	
3.	14	
4.	9	
5.	8	
6.	7	
7.	5	
8.	6	
9.	12	
10.	6	
11	6	
12	6	
13	10	
Total	100	

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

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

Answer all questions.

Write your answers in the spaces provided in this booklet.

If you run out of space, use the continuation page at the back of the booklet, taking care to number the question(s) correctly.

INFORMATION FOR CANDIDATES

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

You are reminded of the need for good English and orderly, clear presentation in your answers.

The use of calculators is not permitted in this examination.

The total number of marks is 100.

Some questions will require you to draw on knowledge from multiple areas of your course of study.

1. Give an example of data that could be stored for each data type.

Data Type	Example Data
Integer	
Boolean	
Real	
Character	
String	

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[5]

[3]

2. (a) **Tick** (✓) **one** box only to match each description with a contemporary secondary storage technology.

Description	Magnetic	Optical	Solid State
Laser beams are projected onto a CD/DVD or Blu-ray disc and if light is reflected back, then data is read as a 1 and if light is not reflected back, data is read as a 0.			
This technology is used in hard disks and tapes. Data is stored on a medium by writing data using a write-head. Data can then be read by the read-head.			
Used in storage media such as flash memory sticks. This technology does not have any moving parts, such as a readhead in magnetic storage.			
(b) Compare external hard disks and and speed.Durability	d flash memory st	icks in terms of du	urability, portability [3]
Portability			
Speed			

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A secondary school is considering purchasing new computer systems for its staff and pupils.They are considering the following specification.



- Desktop
- Processor:
 - o Dual-core
 - o 2.8 GHz / 3.0 GHz (Turbo Core)
 - o 1 MB cache
- 4 GB DDR4 RAM (2400 MHz)
- 1 TB HDD, 7200 rpm
- Motherboard
- 116dB Gaming Sound Card
- 1080 DVI/DP/HDMI PCI Graphics Card

Terabytes: TB

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- · Wireless-AC
- Gigabit Ethernet port (10/100/1000)

- Bluetooth 4.0
- USB 3.0 × 2
- USB 2.0 × 4
- HDMI × 1
- VGA × 1
- · USB keyboard
- USB mouse
- 3.5 mm jack
- DVD/RW
- 90 W AC power adapter
- 90 × 344 × 297 mm (H × W × D)
- 4.3 kg
- 1 year guarantee

(a)		g the components from the spec outer system being considered b	ification, complete the following sentences about by the secondary school.	the
	(i)	The	is the main circuit board of the computer.	[1]
	(ii)	The	will convert analogue input signals into digital o	lata
		and reverse this process for ou	utput.	[1]
	(iii)	The	will be used for the temporary storage of curre	ntly
		running programs and data.		[1]
	(iv)	The	memory is used for the temporary storage of	
		frequently accessed data and i	instructions.	[1]
(b)	Calc	computer has a certain amount ulate the amount of main memonytes (TB).	of main memory. ory this specification has in Megabytes (MB) and	d in [2]
	Meg	abytes:	MB	

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(c)	Suggest two specific upgrades to the specification and state the impact of each upgrade.	[4]
	Upgrade 1:	
•••••		•••••••••••••••••••••••••••••••••••••••
••••••	Upgrade 2:	
•••••		
		······································
		······································
•••••		······································
(d)	Describe the difference between an integrated GPU and a dedicated GPU.	[4]
•••••		······································
••••		
		•••••••••••••••••••••••••••••••••••••••
•••••		

4.	(a)	Draw truth tables for the NOT and XOR logical operators.	Examiner only
			[2]
		(ii) XOR	[2]
	(b)	Construct a truth table which uses one AND logical operator and one OR logical operator in a Boolean expression of your choice.	5]

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5.	(a)	(i)	Conver	t 011010)1101011	.101 ₂ into	o hexade	ecimal.			[2]
		(ii)	Conver	t BE ₁₆ in	to denar	y.					[2]
	(b)	State	e the effe s where	ect of pe appropr	rforming iate.	arithme	tic shifts	on the	following 0	8 bit reg	gister, identifying
		(i)	Two ari	thmetic	shifts rig	ht.					[2]
											[2]
									•••••		

Examiner only

[2]

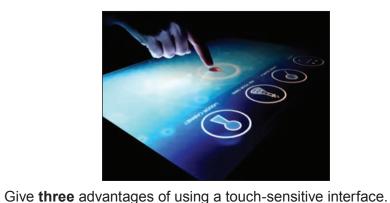
- **6.** Human-computer interaction (HCI) is the term used to describe the communication between people and computer systems.
 - (a) Name the types of HCI shown below.

Cut
Copy path
Paste
Paste Paste shortcut Search...

▼ Search... Favorites image.01 image.02 image.03 image.04 image.05 HCI: Desktop Downloads Google Drive Recent places image.06 image.07 Documents Sky Drive image.08 image.09 image.10 image.11 Sky Drive C:\Users\M Thomas>ping www.wjec.co.uk Pinging www.ujec.co.uk [195.18.213.128] with 32 bytes of data:
Reply from 195.18.213.128: bytes=32 time=47ns TTL=55
Reply from 195.18.213.128: bytes=32 time=48ns TTL=55
Reply from 195.18.213.128: bytes=32 time=49ns TTL=55
Reply from 195.18.213.128: bytes=32 time=47ns TTL=55 Ping statistics for 195.10.213.120:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 47ms, Maximum = 49ms, Average = 47ms HCI: :\Users\M Thomas>

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(i)	Give three advantages of using a touch-sensitive interface.	[3]
•••••		
•••••		
(ii)	Give two disadvantages of using a touch-sensitive interface.	[2]
•••••		

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Clearly showing each	step, simplify the follow	wing Boolean expre	ession using Boolean	identities
iria rules.	$P(0+R)+\bar{R}$	P.R		[၁]

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Explain how Domain Name System (DNS) servers and Internet Protocol (IP) addresses work. [6] DOMAIN SPACE HIERARCHICAL STRUCTURE "." - Root Level Top-Level Domain Space .gov .net .org .com .uk .microsoft .google .ac Second-Level **Domain Space** .port files_server. ftp. www. print_server

Examiner only

[5]

9. (a) Tick (/) the boxes to show if the statements about compilation are True or False.

Statement	True	False
Compilers convert each line of source code into machine code, and execute it as each line of code is run.		
At the lexical analysis stage of compilation, comments and unneeded spaces are removed.		
Tokens are checked to see if they match the spelling and grammar expected, using standard language definitions during the code generation stage of compilation.		
At semantic analysis stage of compilation, variables are checked to ensure that they have been properly declared and used.		
Compilers translate a program written in one language into an equivalent program written in a different language.		
(b) Describe the purpose of an assembler.		[3]

(c)	Describe and give an example of one syntax and one logical programming error. [4]	Examiner only
	Syntax	
•••••	Logical	

Turn over.

Com	puter systems that are used to store data require good data management.	Exami only
(a)	Explain the need for file backups and generations of files.	[4]
•••••		
•••••		
(b)	Explain the need for archiving files.	[2]

1.	Describe the characteristics and purpose of high-level and low-level languages, identifying situations that require the use of each. [6]	Examiner only
	High Level	
	Low Level	

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12.	Describe three ways in which the operating system manages its resources. [6]	Examiner only

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0	nl	y	

13. Computer systems on an organisation's network are experiencing issues.

Despite having a contemporary high-specification, the computer systems have become slow when loading programs and files. The problems appeared to begin when one of the organisation's employees opened an email attachment from an unknown source.

They have employed you to identify and fix what the problem may be.

Describe how you will approach this, giving your initial thoughts of what the problem may be from the description above. Consider how the organisation may have been proactive in preventing this issue.

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END OF PAPER

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