

ZHONGHUA SECONDARY SCHOOL PRELIMINARY EXAMINATION 2020 SECONDARY 4 EXPRESS

Candidate's Name	Class	Register Number

COMPUTING

7155/01

Paper 1

18 September 2020 2 hours

Additional Materials: NIL

READ THESE INSTRUCTIONS FIRST

Write your index number and name on all the work you hand in. Write in dark blue or black pen on both sides of the paper. You may use a pencil for any diagrams or graphs. Do not use staples, paper clips, glue or correction fluid.

Answer all the questions.

Write your answers in this question booklet.

Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place in the case of angles in degrees, unless a different level of accuracy is specified in the question. The use of a scientific calculator is expected, where appropriate. You are reminded of the need for clear presentation in your answers.

At the end of the presentation, fasten all your work securely together. The number of marks is given in brackets [] at the end of each question or part question.

The total number of marks for this paper is 80.

For Examiner's Use:	

Setter: Mr. Calvin Heng Vetter: Mr. Low Kee Ley

This question paper consists of 14 printed pages including this cover page.

(b) Convert 64 Terabytes into KB.

2 Draw a line to match the terms to its correct description.

(a) Convert 8 bits into GB.

1

<u>Terms</u> DoS attack	•	Description
Cookie	•	 A small piece of data used by websites to store personal information on a user's web browser.
Encryption	•	 Hidden program that secretly collects personal information.
Phishing	•	 Flooding network with useless traffic, making the network slow or inaccessible.
Software piracy	•	 Sending fake or spoof emails.
Spyware	•	

[4]

Fill in the blanks with the helping words.

	ALU	APPLICATION	RAM	
	CPU	ROM	UTILITY	
(a)		is high speed, v	olatile memory.	
(b)	The accumulat	or stores intermediate resu	Its of calculations in the	
(c)	Antivirus softw	are is an example of a	software.	
(d)		tells the CPU ho	ow to Boot Up.	[4]
Fiona softw hexa	a is a graphic des /are that she us decimal code.	signer for a publishing comp ses represents each uniqu	oany. The image editing e colour as a six digit	
(a)	As a power of fuse? (workings	16, how many possible uniq s must be shown clearly)	ue colours could Fiona	
				[2]
(b)	Explain one the contract of	penefit to programmers o lifferent colours.	f using hex codes to	
				[2]

5 The use of technology has impacted our lives in many areas. Describe **two** advantages and **two** disadvantages of the impact of technology on healthcare.

Advantage 1 _____ _____ _____ Advantage 2 _____ Disadvantage 1 _____ _____ _____ Disadvantage 2 _____ _____ _____ [4]

area of major development is in user authentication.									
(a)	Describe what is authentication and how it works?								
		[2]							
(b)	One way to conduct authentication is to use two-factor authentication. Explain how two-factor authentication works using a one-time-password (OTP) on the users' mobile phone.	[2]							
(c)	Suggest another way to implement two-factor authentication.	[2]							
		[2]							

6 Access to a computer system is becoming more sophisticated. One area of major development is in user authentication.

7 Besides optical technology storage devices, name **two** other types of external storage technologies found in a computer system. List their corresponding example **and** describe each of them in terms of their advantage and disadvantage.

Туре 1 :	-	
Example:	-	
Description		
		[3]
Туре 2 :	-	
Example:	-	
Description:		
		[3]

8 Study the Boolean statement:

Q = (NOT **A** AND **B**) OR (NOT **B** and C)

(a) Complete the truth table for the Boolean statement above.

В	С	Working Space	Q
0	0		
0	1		
1	0		
1	1		
0	0		
0	1		
1	0		
1	1		
	B 0 1 1 0 0 1 1 1 1 1	B C 0 0 0 1 1 0 1 1 0 0 0 1 1 0 1 1	B C Working Space 0 0 1 1 1 0 1 1 0 0 1 1 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1

(b) Draw a logic circuit for the Boolean statement above.





[2]

- **9** Dr Heng records a patient's temperature once an hour for six hours. Any time the temperature is > 37C, an incidence of fever is recorded. The average of all temperatures taken is calculated at the end.
 - (a) Before you complete the trace table, calculate the average temperature (to one decimal place) using the following test data:

36, 36, 38.5, 37, 38, 36

Expected result = _____

(b)) (Com	plete	the	trace	table	using	the	tem	perati	ures	above.
		-										

Line	Pseu	<u>Pseudocode</u>							
010	temp	temp ← 0							
020	fever	· ← 0							
030	total	← 0							
040	hour	←1							
050	WHIL	E hou	ır < 7						
060		OUTPUT "Enter Temp: "							
070		temp ← USERINPUT							
080		IF temp > 37 THEN							
090		fever ← fever + 1							
100		END	IF						
110		total	= total + temp						
120		hour	= hour + 1						
130	ENDWHILE								
140	average ROUND(total/hour, 1) # round to 1 decimal place								
150	OUT	PUT "/	Average Temp: ", average						
160	OUT	PUT "I	ever Incidents: ", fever						

temp	fever	total	hour	average	OUTPUT

[5]

(c) Is the algorithm correct? If not, write your change to the pseudocode below so that it gives the correct results.

[1]

Ine	spr	eadsnee	t below show	s the inform	mation of	a snoppin	g list.				
		А	В	С	D	E	F				
	1		GIGI PH	IARMACY SER	VICES PTE	LTD					
	2										
	3	S/No	Item	Unit Price	Quantity	Qty Disc	Total				
	4	01	Face Mask	\$20.50	50	10	\$922.50				
	5	02	Tooth Paste	\$8.30	2	0	\$16.60				
	6	03	Mouth Wash	\$3.90	3	0	\$11.70				
	7	7 04 Dental Floss \$4.50 4 5 \$17.10									
	8	05	Liquid Soap	\$11.30	20	10	\$203.40				
	9	06	Hand Sanitizer	\$18.40	3	0	\$55.20				
	10					Sub-total	########				
	11					GST	\$85.86				
	12					Grand Total					
	13										
	14	Quantity	Discount Table								
	15	Quantity	Discount %								
	16	2	0								
	17	4	5								
	18	8	10								
(b) (c)	The most likely function used in cell E7 is: A formula =(C4*D4)*(1-E4/100) is entered into cell F4 to calculate the total price for 4 packs of Dental Floss. The formula is copied to complete column F. Write down the formula in cell F7:										
(d)	GST is charged at 7% of the Sub-Total. Write down the formula in cell F11:										
(e)	Why does the cell F10 show "#######"?										
(f)	C a th	ustomers lucky dra e custon	s who spend a aw. Write dov ner qualifies o	a sub-total vn the fund r "-" otherv	of \$1,00 ction in c vise.	0 and abov ell B12 to	re qualify display "	[1 ' for *" if			
								[1			

10 The spreadsheet below shows the information of a shopping list.

- 11 In a computer game, a character's status depends on three variables: hunger, hydration and comfort. If any of the three conditions are met then the character dies, otherwise they are alive. Conditions:

 - Any of the variables are equal to 0.Any two of the variables are less than 20.
 - All three of the variables are less than 40.

There are three errors in the Python code. Locate the errors and state the correct code.

	LineCode100alive == True110If hunger == 0 or hydration == 0 or comfort == 0:120alive = False130elif (hunger < 20 and hydration < 20) or (hunger < 20 and140comfort < 20) and (hydration < 20 or comfort < 20):150alive = False160elif hunger < 40 or hydration < 40 or comfort < 40:170alive = False180else:190alive = True	
	Note: Line 140 continues from Line 130	
(a)	Error 1:	
	Correction 1:	
(b)	Error 2:	
	Correction 2:	
(c)	Error 3:	
	Correction 3:	[6]
(d)	The variable alive is of type	[1]
(e)	State another Boolean operator besides the two used in this program:	•
		[1]

10

12	(a)	Convert the hexadecimal number 87 into a denary number. Working must be shown.	
	(b)	Convert the denary number 79 into an 8-bit binary number. Working must be shown.	[2]
	(c)	Convert the hexadecimal number 8C into a binary number. Working must be shown.	[2]
	(d)	The function denary() converts one hexadecimal character to denary. (e.g. denary(F) = 15). Calculate the value of denary(A) + denary(C).	[2]
			[2]

13 When registering on a website, a user's password should be more than 6 characters long and it must be different from their username.

Write an algorithm using pseudocode to check if the password is valid. If it is invalid, it should say why.

Complete the following table of variables to be used:

Variables used	<u>Remarks</u>	
		[4]

Write your pseudocode here:

[6]

14 A robot moves on the 4 x 4 square grid shown below.



A user defined function, SqMove, is part of a flow chart that tells the robot how to move.



Draw a flow chart to show how the robot moves. The flow chart should:

- Ask the user to enter which square the robot starts on.
- Run the user defined function SqMove on a loop.
- Stop when the robot reaches the top or the right of the grid. This is when x = 4 or y = 4.

In your flow chart, you may summarize the portion taken by SqMove as:



Draw your flow chart here:



