

## Sixth Form Entrance Examination

## COMPUTER SCIENCE SPECIMEN

Time allowed: 1 hour

Name: _			
Name.			

#### INSTRUCTIONS TO CANDIDATES

- Write your name above.
- $\bullet\,$  Do not open the paper until instructed to do so.
- $\bullet$  A calculator is not allowed for this paper.
- $\bullet$  Write clearly and fully where the questions request it.
- $\bullet$  There are three sections in this paper. You must answer all questions in each section.
- $\bullet\,$  The maximum mark for this paper is [55 marks]

November 2019

# Section A - Hardware and Software

1.	Describe the difference between <b>primary</b> and <b>secondary</b> storage in a computer. Provide one example for each.  [4]
	Primary is volatile e.g. RAM/Cache
	Transfer of the state of the st
	Secondary is not volatile , e.g. HOD/SSD/OPTICAL
2.	Give three examples of the roles of an operating system. [3]
	Manage resources, Manage memory, provide UI,
	provine services for Software etc.
	(1) each, max of 3.
3.	(a) Match the following type of media to their corresponding average capacity. [3]
	• BluRay Disk • 512 GB - 6 TB (1) for 2 correct
	• Hard Disk • 4.7 GB - 8.5 GB
	• DVD
	• Solid State Drive - • 4GB - 2 TB (3) for all correct
	• CD-ROM • 700 MB
	(b) State what the abbreviation ROM stands for in "CD-ROM". [1]
	Read Only Me mory
	(c) Arrange the following storage types from slowest to fastest access speed: magnetic, optical and solid state. [2]
	Optical -> Magnetic -> Solid (1 mark per corred comparison
	(d) Explain why you would expect a BluRay disk to have a higher access speed than a CD-ROM. [2]
	1 second of Blufay video transfers more data
	than I second of CD-ROM Music. (accept any good reasoning)
4.	Extra information stored with an image is called metadata. Give two examples of image metadata. [2]
	E.g. resolution dimensions, colour depth, date etc
	(1) each, max 2)

5. (a) Define what a CPU is in a computer.	[1]
Central Processing Unit	
(b) Briefly explain the steps involved in the Fetch-Decode-Execute cycle.	[4]
- Instruction fetched from memory /	
- Decoded by CP4	
-> and executed /	
-> Next Instruction fetched (and repeat)	
6. Ryan brags that he uses his new headphones to only listen to "FLAC, because it is a lossles format". Explain what Ryan means by lossless file format.	s file [3]
Music is compressed when stored.	
Lossless compression reduces the size of file, without losing	
audibe Information	

Turn over for next section

### Section B - Programming

- 7. Given that a=7 and b=6, state what appears on the screen when each of the following snippets of code is executed.
  - $\begin{array}{ll} \text{(a)} & \text{if } a>7 \text{ or } b=1 \text{ then} \\ & \text{print} & \text{Yellow} \\ & \text{else} \\ & \text{print} & \text{Blue} \\ & \text{end if} \end{array}$

[1]

### Blue

(b) if NOT(a>b) or  $(b\le 7)$  then print Red else if NOT(a>b) or  $(b\ge 7)$  then print Blue else print Green end if

[1]

#### Red

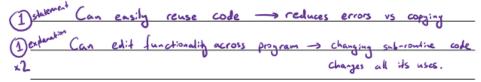
- The following pseudocode is intended to find and display the largest number in an array of ten positive integers.
  - $1: \; \max = numbers[0]$
  - 2: for n = 0 to 9 do
  - 3: if  $\max > numbers[n]$  then
  - 4: max = numbers[n]
  - 5: end if
  - 6: end for
  - 7: print max

The pseudocode contains an error and does not work as intended. State the line of code that contains the error and suggest a correction. [2]

## 3: max < numbers [n]

9. Describe and explain two advantages of writing code using sub-routines.

[4]



Improves readability -> replaces lengthy code with short command.

10. An estate agent keeps details of all the properties they have available for rent.

PropertyID	Туре	MonthlyRent	Beds	Furnished	<b>DistanceToStation</b>
1	Apartment	£800.00	2	Υ	0.3
2	Semi	£475.00	2	N	1.5
3	Apartment	£1150.00	3	N	0.5
4	House	£1500.00	4	Υ	0.2
5	Apartment	£900.00	2	Υ	0.3
6	Apartment	£1250.00	3	Υ	0.2
7	Semi	£550.00	3	Υ	2.4
8	House	£600.00	3	N	0.6

[4] List the Property IDs of the properties that will be found by the following SQL queries. (a) SELECT \* FROM tblRental WHERE MonthlyRent ≤ 550.00 OR Furnished = 'Y' (1) for 2 (b) SELECT \* FROM tblRental WHERE Type = "Apartment" AND DistanceToStation < 0.3 (2) for 6 only 11. Jimmy produces the following algorithm. 1: limit = input("Please enter an upper limit")2: x = 03: while x < limit do4: **print** x 5: x = x + 26: end while (a) Write down the outputs for the algorithm for an input of 9. [2]other numbers present: (b) Jimmy intended this algorithm to print the first 9 non-negative even numbers in this case. Explain what this algorithm does instead. [2](i) (c) Suggest how line 4 and line 5 can be changed to make the algorithm work as intended without changing any other part of it. [3]4: print 2x (1) 5! X=X+1 No other changes 1

oum = input()	Input and shoring (1)
if num 70 and num 210:	il_O
print Blue	correct else it's 1
else if num 7,10 and num <20!	correct else (1)
print Red	correct comparisons (1)
else if num 7/20 and num <30:	correct out puts 1)
print Green	

12. Write pseudocode that will perform the following:

If the number is between 0 and 10, output the word  ${f blue}.$  If the number is between 10 and 20, output the word  ${f red}.$ 

Ask a user to enter a number.

Turn over for next section

# Section C - Implications of Computer Use

to provide advice on medical, financial and other matters.	
(a) Provide an example of how AI is used in everyday life, or at a te	hnical level. [1]
Angthing sensible	
(b) Discuss the potential ethical and cultural issues associated with Marks will be awarded for clarity of argument and knowledge of	he application you have stated.
1 for Style	
(3) for relevance.	

13. Artificial Intelligence is increasingly used in everyday life of people, but also at more technical levels

End of paper