

SPRINGFIELD SECONDARY SCHOOL Preliminary Examination 2022 Secondary 4 Express/ 5 Normal Academic

STUDENT NAME	
CLASS	REGISTER

COMPUTING

Paper 1 Written

7155/01 12 September 2022 2 hours

NUMBER

Candidates answer on the Question Paper. No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your class, index 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.

Approved calculators are allowed.

Answer all questions.

The number of marks is given in brackets [] at the end of each question or part question. You should show all your working.

The total number of marks for this paper is 80.

For Examiner's Use					
Total	/80				

Do not turn over this question paper until you are told to do so.

- 1 An administrator of a finance company uses a spreadsheet to record the loans it has given out to car buyers. It records:
 - loan amount taken
 - loan period in terms of number of years
 - interest rate charged per annum
 - monthly instalment payable
 - loan amount that is above \$50000 or have a loan period of more than 5 years

	Α	В	С	D	E	F
	No	Loan amount	Loan period /	Interest rate	Monthly instalment	Loans is above \$50000 or loan
1	NO.	Luan annound	year	(per annum)	wontiny instantient	period is more than 5 years
2	1	\$28,000.00	3	2.80%	\$843.11	
3	2	\$52,000.00	4	2.80%	\$1,204.67	Yes
4	3	\$30,000.00	2	2.50%	\$1,312.50	
5	4	\$45,000.00	5	3.00%	\$862.50	
6	5	\$80,000.00	7	3.00%	\$1,152.38	Yes
7	6	\$56,000.00	6	3.00%	\$917.78	Yes
8						
9						
10					Total loan amount:	
					Number of loans that is above	
					\$50000 or have a loan period	
11					of more than 5 years:	

(a) Identify the **most appropriate** data type for the data in the following cell references:

Cell	Data type
A2	
В3	
D7	

[3]

(b) The cell **F10** will calculate the total loan amount given out.

Identify the function that will need to be entered into F10.

......[1]

(c) The cell **F11** will calculate the number of loans that is more than \$50000 or has a loan period of more than 5 years.

Identify the function that will need to be entered into F11.

......[1]

(d) The cell **F7** will indicate "Yes" when the loan that is more than \$50000 or has a loan period of more than 5 years, The cell should be blank if otherwise.

Describe the formula that will need to be entered in cell F7.

[3]

2 (a) Complete the following statements on computer architecture.

Most computer parts can be organised into the following roles:

The processor consists of the that processes data by performing basic mathematical logical operations, and the follows instructions and decides when data should be stored, received, or transmitted.

The stores data that can be volatile or involatile.

The transport data from one part of the computer to another.

The and

allow users to enter data and instructions, and to display processed data respectively. [6]

(b) The table contains descriptions about types of external storage mediums.

Tick (\checkmark) one or more boxes in each row to indicate if the description is about optical, magnetic, or solid-state memory.

Statement	Optical	Magnetic	Solid-state
Data stored as very small pits			
Fastest in reading and writing			
Relatively large storage capacity (at least 1TB)			
Vulnerable to drops, mechanical shock, scratches and fingerprint			
		•	[5]

- 3 (a) Convert the binary number 1001 1101 into a positive whole denary number.
 -[1]
 - (b) Convert the positive whole number **314** into hexadecimal. Show your working clearly.

- (c) State two advantages of using hexadecimal notation to represent binary values.

 4 (a) An algorithm is designed for a sales record system in a fast food restaurant. The system will record a daily list of the quantity and cost of every item sold in the restaurant. At the end of each day, the system will inform the user on the most popular item sold that day as well as the total earnings for the day.

State the **inputs**, **outputs** and the **processes** required for the algorithm.

- **5** Technology brings about social and economic impacts on various areas of life, as well as related ethical issues.
 - (a) State one positive and one negative social impacts of technology in healthcare.

(b)	b) State one positive and one negative social impacts of technology in financ								
	Posi	tive impact							
	Neg	ative impact							
		[2]							
(c)	State	e one ethical issue related to the impact of technology in entertainment.							
		[1]							
(d)	Johr as a	nson finds a picture from the Internet very attractive and decides to use it logo for his school project straight away.							
	(i)	What is the possible infringement he has made by doing so and how can he avoid committing this infringement?							
		[2]							
	(ii)	Johnson has also been warned by the teacher against making another type of infringement of intellectual property while doing the writeup for his project. Name and describe this type of infringement.							
		[2]							

6 (a) Draw the logic circuit to represent the following Boolean statement. Do not simplify the statement.



 $\mathbf{X} = (\mathbf{A} \text{ NOR } \mathbf{B}) \text{ OR } (\text{NOT } \mathbf{C} \text{ AND } \mathbf{B})$

(b) Complete the truth table for the Boolean statement:

$\mathbf{X} = (\mathbf{A} \text{ NOR } \mathbf{B}) \text{ OR } (\text{NOT } \mathbf{C} \text{ AND } \mathbf{B})$

			Working space	
Α	В	С		X
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

7 (a) Draw one line to link each network term to its correct description.

Network term	Description
Local area network	A component that enables the transfer of data between a device and a network
[]	
Router	Network of computing devices connected within the same building such as a school or office
Network interface controller	A device that converts digital data into a suitable form for transmission
Modem	Network of computing devices connected typically across multiple geographical locations
Wide area network	A device that receives and forwards data packets using IP addressing

[5]

(b) State and explain **two** factors that should be considered when deciding between a wired or wireless network.

actor 1
xplanation
actor 2
xplanation
[4]

8 The diagram below shows five bytes received over a network where parity check is used.

1110111	00111000	10011001	11001101	01011001
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9 The following algorithm generates a participant's bib number for a school sports festival. At the start, the algorithm will request the user to provide the number of participants in a team.

Each team should have no more than 8 participants and the algorithm will prompt the user to re-enter the number again if the number entered is invalid.

The user will be asked to key in their class and index number. The algorithm will join the class and index number of the participant to form a participant's bib number.

The algorithm will print the list of participants' bib number for the team at the end.

```
01 OUTPUT "Enter the number of participants in the team: "
02 INPUT num
03
04 WHILE num is not an integer or num < 0 and num > 8
05
      OUTPUT "Number entered is invalid, please re-enter: "
06
      INPUT num
07 ENDWHILE
80
10
11 FOR x = 0 to num
12
      OUTPUT "Enter your class: "
13
      INPUT class
14
      OUTPUT "Enter your index number: "
15
      INPUT index
16
      bib = class + index
17
      bib list -= [bib]
18 NEXT
19
20 OUTPUT "The bib numbers for the team are: "
21
22 FOR i = 1 to length (bib list)
23
      OUTPUT bib list[i-1]
24 NEXT
```

There are **five** errors in this pseudo-code.

State the line number of each error and write the correct pseudo-code.

Error 1	
Correction	
Error 2	
Correction	
Error 3	
Correction	
Error 4	
Correction	
Error 5	
Correction	
	[10]

10 A program is used to tabulate the results of a competition between two javelin throwing competitors.

The two competitors will take turns to throw the javelin for three rounds. When the three rounds are completed, the competitor who has thrown the furthest distance will be declared as the winner. If the furthest distances for both competitors are the same, the competitors with the highest average distance from the three rounds will be declared the winner.

The program needs to:

- take the distance of the throw for competitor 1 and competitor 2 in each round of the competition as input,
- determine the furthest and average distances thrown by each of the competitors after the three rounds of competition,
- compare the furthest distances thrown by the two competitors and output the winner of the competition and the furthest distance thrown.
- if the furthest distances for the two competitors are the same, compare their average distance, output the winner and the average distance thrown.

Write an algorithm, using pseudo-code or a flowchart, to input the distance for the three rounds of competition, and output the required results. You do **not** need to validate the input.

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