

THE UNIVERSITY OF AUCKLAND

TEST 2003

COMPUTER SCIENCE

Introduction to Computing and Applications
(Time Allowed: ONE hour)

Surname
 (Family name)

First Name(s)
 (Given names)

Student ID:

Lab Day/Time:

NOTE: Attempt **ALL** questions.
 Write your answers in the space provided.
 There is space at the back for answers that overflow the allotted space
 Calculators are **NOT** permitted

Section	Marks	Possible Marks
Hardware and Software		10
Representation of Information		10
Applications		20
2-D Graphics		10
Java		50
Total		100

Introduction to Hardware and Software [10 marks]

1. Which of the following are parts of the **operating system**? (3 marks)
(list all that apply)

- a) Flash memory
- b) Kernel
- c) File manager
- d) Keyboard
- e) I/O Controller

2. This is the same system board used in Lab02.

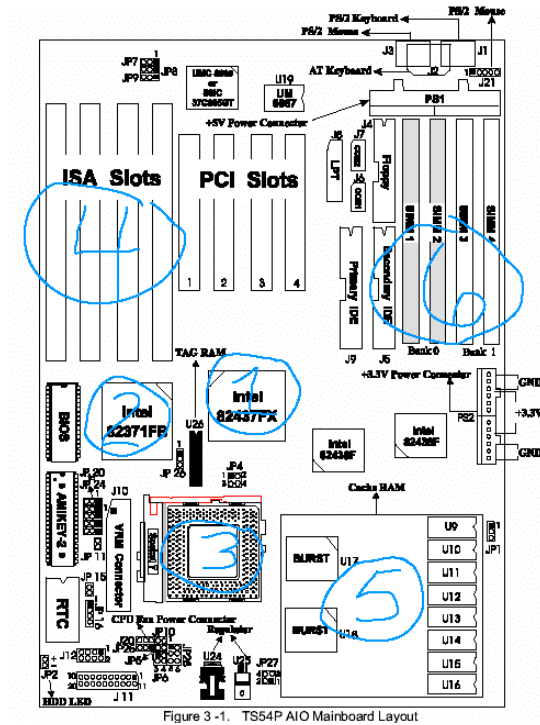


Figure 3-1. TS54P AIO Mainboard Layout

Which number corresponds to **RAM**? (2 marks)

3. Each hardware item in the left column of the table below has **ONE** correct statement written about it in the right column. Choose the **BEST** match for each. Place the matching number in the centre column. (5 marks)

Answers:

RAM		1. Volatile Memory
ROM		2. "Brain" of the Computer
Magnetic Tape		3. Sequential Access Secondary Storage
Magnetic Floppy Drive		4. Non Volatile Memory
CPU		5. Random Access Secondary Storage

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Representation of Information [10 marks]

4. Convert the following number from decimal to binary. **78** (4 marks)

Show your workings

5. Add the following 2 binary numbers. Give the answer as a binary number. (4 marks)

$$\begin{array}{r} 10110 \\ + 11011 \\ \hline \end{array}$$

6. If the ASCII code for “m” is **109**, what is the ASCII code for “p”? (2 marks)

Applications [20 Marks]

7. Given the following Boolean expressions, indicate if they evaluate to TRUE or FALSE:
 Circle the correct answer: (3 marks)

- a) $OR(SUM(1,2,3)=5, 3<7)$ True/ False
- b) $AND(5<6, NOT(2>3))$ True/ False
- c) $OR(2<1,2>4)$ True/ False

Use this spreadsheet to answer the next 3 questions found on the opposite page.
 This spreadsheet contains a table of return airfares on Singapore Airlines and lists purchases of Economy Class Tickets for 4 customers.

	A	B	C	D	E	F	G
1							
2	Return Fares by Destination				Tax Rate:	0.045	
3			Business	First			
4		Economy	Class	Class			
5	Singapore	\$1,500	\$3,200	\$4,500			
6	London	\$2,500	\$4,100	\$6,100			
7	Frankfurt	\$3,000	\$5,400	\$6,800			
8	Tokyo	\$2,500	\$4,800	\$5,500			
9							
10							
11		Economy					
12	Person	Tickets	Destination	Cost	Taxes	Total Cost	
13	Mark	2	London	\$5,000	\$225	\$5,225	
14	Sally	1	Singapore	\$1,500	\$68	\$1,568	
15	Jarvis	4	Tokyo	\$10,000	\$450	\$10,450	
16	Arthur	2	Singapore	\$3,000	\$135	\$3,135	
17	Li	3	Frankfurt	\$9,000	\$405	\$9,405	
18					Total Sales:	\$29,783	
19							
20							

Answer Sheet

Name: _____

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8. Column D contains the total ticket costs before taxes, for each person. All tickets are Economy Fare tickets. Use the VLOOKUP function and **write a formula for cell D13**. Remember to adjust the value based on the number of tickets purchased (column B). This formula **must work** when filled down to cell D14. (6 marks)

9. Column E, labelled “Taxes”, contains the taxes for the total ticket cost (column D). It uses the tax rate found in cell F2. **Write a formula for cell E13** that will calculate the taxes. This formula **must work** when it is filled down. (4 marks)

10. If I put the following formula in cell F13

$$=D13+SE\$13$$

and fill this formula down to cell F14, what values appear in F13 and F14? **If either of the values differ** from the value shown in the spreadsheet above **explain** why. (3 marks)

Value in F13: _____

Value in F14: _____

CONTINUED

Microsoft Word

11. State two reasons why style sheets in Word are beneficial. (2 marks)

12. Assume I have my formatting marks turned on. What does the following character mean in your word document? (2 marks)

¶

2D Graphics [10 Marks]

13. Name one image compression algorithm discussed in class and state whether it works better for photographs or for vector graphics? (4 marks)

14. How many **bits**, and how many **Bytes**, are required to store a 16 colour bitmap image that is 100 pixels high and 10 pixels wide? (6 marks)
(Show workings for partial credit)

bits: _____

Bytes: _____

JAVA [50 marks]

General Questions (10 marks)

15. What is the difference between the Java applet window and the Java console window?

16. Give an example of how to declare constants.

17. Why is it good programming practice to use constants?

Answer Sheet

Name: _____

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18. Why should you enclose your expressions in round brackets when following a string? Give an example.

19. List two good programming practices that should be followed to ensure your program is easy to read and understand.

Expressions (10 marks)

20. What is the output from the following code extract?

```
final int M = 2;  
final int C = 10;
```

x

```
int x = 7, y = 2;
```

y

```
x = y + x / y;
```

```
y = M + 2 * x;
```

```
y = y + 1;
```

```
System.out.println("x = " + x + ", y = " + y);
```

Answer:

CONTINUED

Debugging (10 marks)

21. Carefully examine the following code fragment. Identify and correct **10** of the errors. Circle the errors and make the appropriate changes.

```
/* Declare and init variables
final int AREA=2;

int height=0; length=0, width;

volume=0;

System.out.println("Please enter the height in metres: ");

height=Keyboard.readDouble();

System.out.print("Please enter the length in metres: ")

length=Keyboard.readInt();

System.out.println("Height is: " + height + "width is " + width +
length is + length);

System.out.prntln("Please enter a depth: ");

depth=Keyboard.readInt();

AREA=width*length;

System.out.println("area: " + area + sqm);
```

Output (10 marks)

22. Consider the following program:

```
int balance=0, deposit=0;
int bonus=100;

System.out.println("Your balance is: $" + balance);
System.out.print("Enter the amount you would like to deposit: $");
deposit=Keyboard.readInt();

balance = deposit + balance;

System.out.print("Enter another deposit: $");
deposit=Keyboard.readInt();
balance = deposit + balance;

if(balance > bonus){
    System.out.println("Congratulations! Bonus reached!");
    balance=balance+bonus;
}
else {
    System.out.println("Updated your balance...");
}

System.out.println("Your balance is now: $" + balance);
```

Complete the output (**add any additional lines** of output that occur) if the user types in:

(a) 50 and 59

```
Your balance is: $_____
Enter the amount you would like to deposit: $_____
Enter another deposit: $ _____
```

(b) 20 and 40

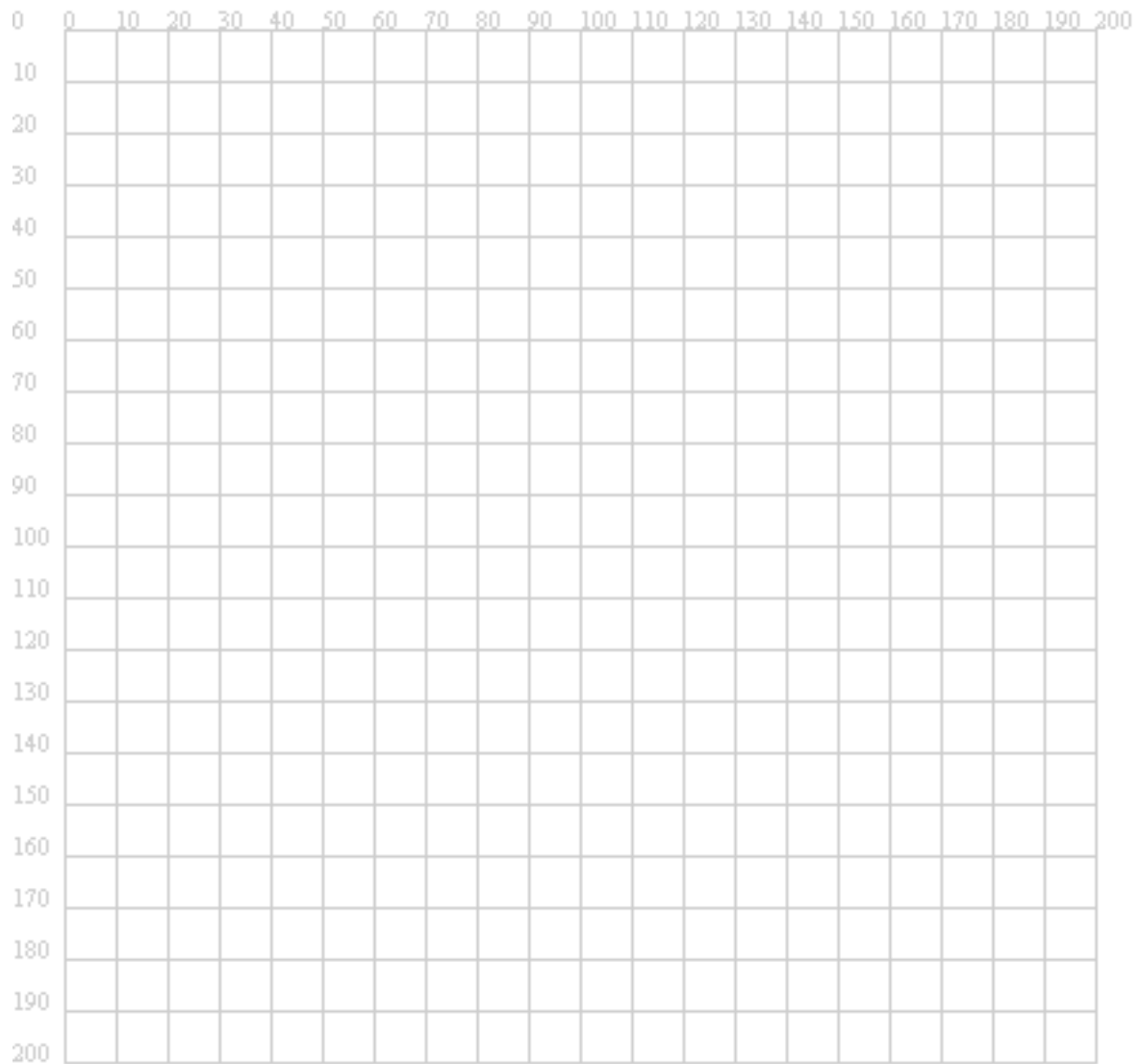
```
Your balance is: $_____
Enter the amount you would like to deposit: $_____
Enter another deposit: $ _____
```

The Applet Window (10 marks)

23. Look at the following code fragment carefully:

```
g.drawLine(20,100,140,50);  
g.drawLine(140,50,160,100);  
  
g.drawRect(20,100,140,100);  
g.fillRect(100,140,40,60);  
  
g.drawString("Home",20,30);  
g.drawLine(10,35,70,35);
```

Draw the output in the grid provided.



Answer Sheet

Name: _____

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Overflow Sheet 1

Write the question number next to your answer.

You must **ALSO** indicate in the allotted space that you have used the overflow sheet.

CONTINUED

Answer Sheet

Name: _____

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Rough Working

This sheet will **NOT** be marked

Answer Sheet

Name: _____

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Rough Working

COMPSCI 111S2C

This sheet will **NOT** be marked