THE UNIVERSITY OF AUCKLAND

TEST 2002

COMPUTER SCIENCE

Introduction to Computing and Applications

(Time Allowed: ONE hour)

Surname
(Family name)

| MODEL ANSWERS |

First Name(s)
(Given names)

Student ID:

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
Java		40
General Computing		10
Total		50

Java (40 marks)

1. Below is a program segment and a Java Console window. Write the output of the program in the Java Console window. You must take care to be exact. Please represent a space by a ^ and any blank line by ~~~.

```
//   What is the output?

final int THIS_NUMBER = 4;

int counter, upTo;
counter = 3;
upTo = 7;

System.out.println("2 * " + counter + " = " + (2 * counter) );

counter = counter + 5;


System.out.println(counter + " * " + (counter + 1) + " = " +
                                    (counter * (counter +1)) );

counter = counter - 3;


System.out.println(upTo + " * " + counter + " = " + (upTo *
                                    counter));

System.out.println(upTo + " / " + THIS_NUMBER + " = " + (upTo /
                                    THIS_NUMBER));
```
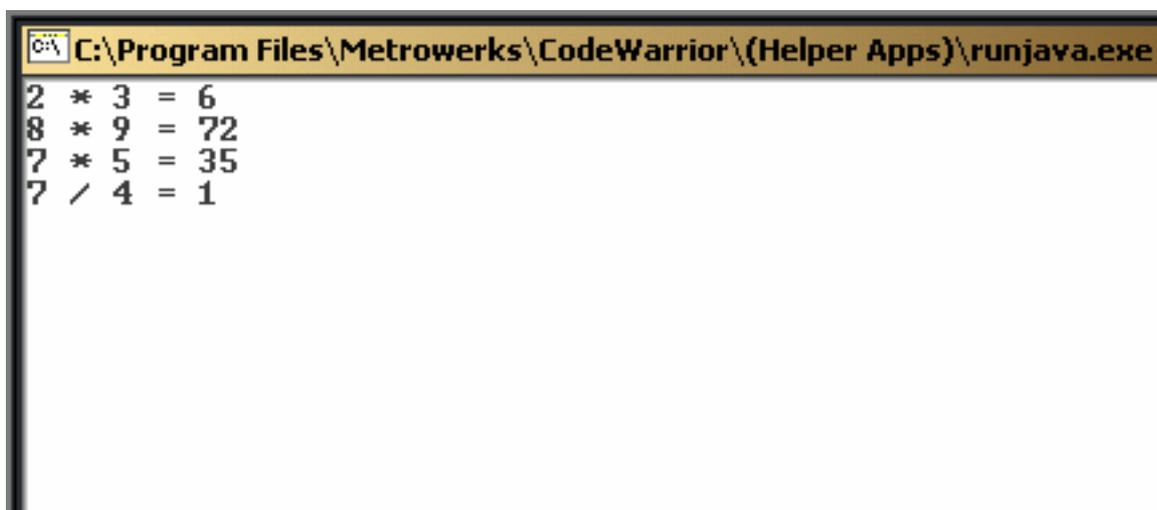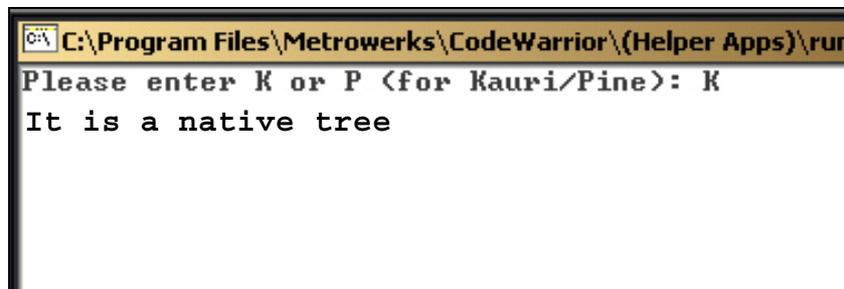
Write the output in the Java Console window below:

```
C:\Program Files\Metrowerks\CodeWarrior\(Helper Apps)\runjava.exe
2 * 3 = 6
8 * 9 = 72
7 * 5 = 35
7 / 4 = 1
```

(6 Marks)

2. Below is a program segment and two questions
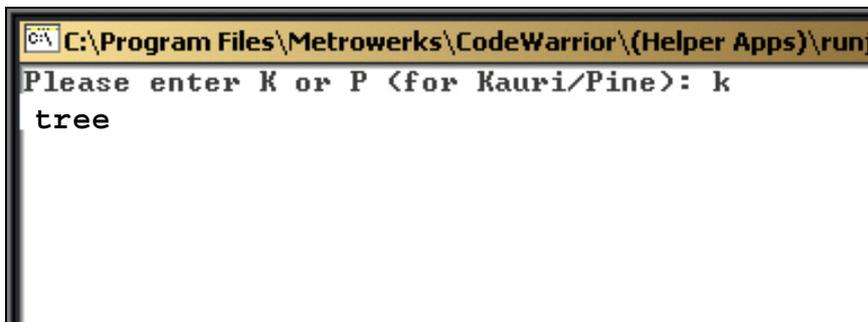
```
//    What is the output?
      char name;

      System.out.print("Please enter K or P (for Kauri/Pine): ");
      name = Keyboard.readChar();

      if (name == 'K')
            System.out.print("It is a native ");

      else if (name == 'P')
            System.out.print("It is not a native ");

      System.out.println("tree");
```

(a) What will be displayed in the Java Console window if the user enters the letter K from the keyboard and presses the Enter key?


```
C:\Program Files\Metrowerks\CodeWarrior\(Helper Apps)\run
Please enter K or P (for Kauri/Pine): K
It is a native tree
```

(b) What will be displayed in the Java Console window if the user enters the letter k from the keyboard and presses the Enter key?


```
C:\Program Files\Metrowerks\CodeWarrior\(Helper Apps)\run
Please enter K or P (for Kauri/Pine): k
 tree
```

(4 Marks)

3. Below is a program segment and a Java Console window. Write the output of the program in the Java Console window. You must take care to be exact. Please represent a space by a ^ and any blank line by ~~~.

```
//     What is the output?
       final int THIS_NUMBER =2;

       int counter;
       counter = 1;

       do {
             System.out.print(counter);
             counter = counter + 1;
       } while ( counter <= THIS_NUMBER);
       System.out.println("End of first loop");

       do {
             System.out.println(counter);
             counter = counter + 1;
       } while ( counter <= 3 * THIS_NUMBER);
       System.out.println("End of second loop");

       while ( counter > 0) {
             System.out.println("X-");
             counter = counter - 2;
       }
       System.out.println("End of third loop");
```

Write the output in the Java Console window below:

```
C:\Program Files\Metrowerks\CodeWarrior\(Helper Apps)\runj
12End of first loop
3
4
5
6
End of second loop
X^
X^
X^
X^
End of third loop
```

(8 Marks)

4. Below is a program segment to draw a pattern, with some boxes for you to fill in. Complete the program segment so that it produces the output shown in the Java Console window:

```
C:\Program Files\Metrowerks\CodeWarrior\(Helper Apps)\
12345
*^^^*
*^^^*
*^^^*
*^^^*
*^^^*
-----
```

```
final int MAX = 5;
        int i, j;

        i = 1;
        // Print a line of numbers from one to MAX
        // You must use a loop
        do {
                System.out.print(i);
                i = i + 1;
        } while (i <= MAX);
        System.out.println();

        i = 0;
        do {
                j = 1;
                System.out.print("*");

                // Print a line of (MAX - 2) carot marks (^s)
                // You must use a do while loop
                do {
                        System.out.print("^");
                        j = j + 1;
                } while (j <= MAX - 2);

                System.out.println("*");
                i = i + 1;
        } while (i!= MAX);

        // Print a line of MAX minus signs
        // You must use a while loop
        i = 1;
         while (i <= MAX) {
                System.out.print("-");
                i = i + 1;
        }
```
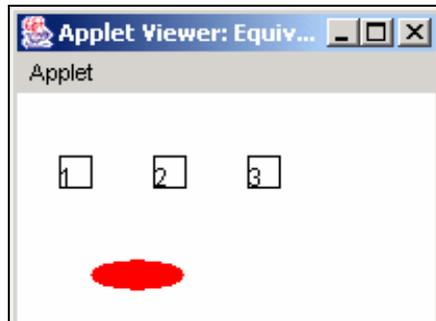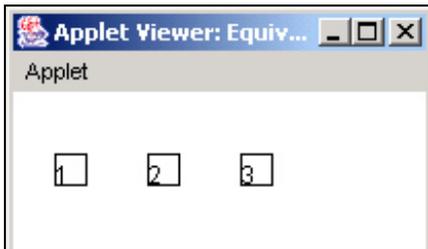
(10 Marks)

5. Below is a program segment with some spaces for you to fill in. Your program should initially display the three buttons as shown in the leftmost Applet window shown below.

- If the user clicks in button 1 a red circle of 1 unit in diameter is filled in.
- If the user clicks in button 2 a red oval of width 2 units and height 1 unit is filled in
- If the user clicks in button 3 a red oval of width 3 units and height 1 unit is filled in (see the rightmost Applet window).

NOTE:
- The   width and height of each button is one unit.
- The squares are separated by a distance of 3 units.
- The numbers are in the bottom left hand corner of each square.
- You must use the variables provided.
- You can use the integers 1, 2, 3, 4, 5, 6 & 7 in your program.

```
// program to draw oval whose size depends on the user's mouse click

        int left1; // The leftmost position of the first small square
        int top1;  // The top of the three small squares
        int left2; //The leftmost position of the oval
        int top2;  // The top of the oval

        int unit;   // The unit size

    // Declare your variables here
        int  x;
        int counter;
        int h, v;

    // initialize

        left1 = 20;
        left2 = 35;
        x = left1;
        top1 = 30;
        top2 = 80;
        unit = 15;

     // initialize your variable(s) here
        counter = 1;
```

```
// Use a singe loop to:
// Draw the three squares
// And place a number in each

   do {
      g.drawRect(x, top1, unit, unit);
      g.drawString("" + counter, x, top1 + unit);
      x = x + 3 * unit;
      counter = counter + 1;
   } while (counter < 4);


            // Get the mouse coordinates
                  h = Mouse.getX();
                  v = Mouse.getY();

            // Set the color red
                  g.setColor(Color.red);

            // Fill the corresponding oval
                  x = left1;
                  if (h > x &&  h < (x + unit) && v > top1 && v < (top1 + unit))

                        g.fillOval(left2, top2, unit, unit);

                  x = x + 3 * unit;

                  if (h > x  &&  h < (x + unit) && v > top1 && v < (top1 + unit))

                        g.fillOval(left2, top2, 2 * unit, unit);

                  x = x + 3 * unit;

                  if (h > x &&  h < (x + unit) && v > top1 && v < (top1 + unit))
                        g.fillOval(left2, top2, 3 * unit, unit);
```

12 Marks

General Computing (10 marks)

6. List 2 common symptoms of OOS.

Symptoms: Tingling in fingers, soreness in limbs, chronic pain, chronic fatigue, prolonged tiredness, loss of strength, muscle fatigue

(1 mark)

7. Give an example of a secondary storage device.

Hard Drive, Floppy Drive, Tape Drive, CD-ROM

(1 mark)

8. Give the names of the founders of Apple Computers

Steve Jobs, Steve Wozniak

(2 marks)

9. How many different numbers can be represented using 4 bits?

2 raised to power of 4 = 2x2x2x2 = 16

(1 mark)

10. Convert the following decimal number to binary: 17

16 + 1 = 1 0 0 0 1

(1 mark)

11. Give 4 examples of computer software companies (other than Microsoft) and give an example of a product that each company produces (e.g. Microsoft produces Windows XP).

Any 4 software companies and products accepted. Examples:
Nullsoft produce WinAmp
Metrowerks produce CodeWarrior
Adobe produce Photoshop, Acrobat, Illustrator
Corel produce WordPerfect, CorelDraw
Blizzard produce Diablo, Warcraft etc.

(4 marks)