



PRINCE OF SULTAN UNIVERSITY
FACULTY OF ENGINEERING
Department of Computer Engineering

Final Examination: Semester 1

Academic Year: 2004-2005

Date: Sunday, 3rd October, 2004

Time: 9:00 – 11:00 (2 hours)

Subject Number: 240-571

Room: R 201

Subject Title: Introduction to J2ME Programming

Lecturer: Aj. Andrew Davison

Exam Duration: 2 hours

This paper has 3 pages.

Authorized Materials:

- Writing instruments (e.g. pens, pencils).
- Books (e.g. dictionaries) and calculators are **not** permitted.

Instructions to Students:

- *Answer questions in English.* Perfect English is **not** required.
- Attempt all questions.
- Write your answers in an answer book.
- Start your answer to each question on a new page
- Clearly number your answers.
- Any unreadable parts will be considered wrong.
- When writing programs, use good layout, and short comments; marks will not be deducted for minor syntax errors.
- The marks for each part of a question are given in brackets (...).

Question 1

(40 marks; 40 minutes)

- a) Modify the `SweepCanvas` class given below to use:
- double buffering; (10)
 - an accurate update/repaint/sleep cycle, with an adjustable sleep time. (10)
- b) Explain double buffering in words. (5)
- c) Explain in words why the update/repaint/sleep cycle that you coded in (a) is more accurate than the approach in the `SweepCanvas` class below. (15)

```
public class SweepCanvas extends Canvas implements Runnable
{
    private boolean gameOver;

    public SweepCanvas()
    {
        gameOver = false;
        Thread t = new Thread(this);
        t.start();
    }

    public void stop()
    {
        gameOver = true;
    }

    public void paint(Graphics g)
    {
        // draw things using g, e.g.
        g.setGrayScale(255); // white
        g.fillRect(...);
    } // end of paint()

    public void run()
    {
        while (!gameOver) {
            // update the game state
            repaint();
            try {
                Thread.sleep(50);
            }
            catch (InterruptedException ie) {}
        }
    } // end of run()
} // end of SweepCanvas class
```

Question 2

(20 marks; 20 minutes)

- a) Briefly describe *persistent storage* in MIDP. Do not include code examples. (5)
- b) Write a *single method* which opens a record store called "foo", and writes its IDs and values to standard output. Do *not* implement a complete MIDlet. (10)
- c) Explain a good coding style for using RMS for implementing high scores storage in games. Do not include code examples. (5)

Question 3

(30 marks; 30 minutes)

Write a `SplashScreen` class that displays a single image loaded from "`coe.png`" for 5 seconds or until the user presses a key.

Do not implement a complete MIDlet, only the `SplashScreen` class.

Document the complicated parts of the code.

Question 4

(30 marks; 30 minutes)

- a) Describe the *generic connection framework*. Do not include any code fragments in your answer. (10)
- b) Write a *single method* which downloads and stores the contents of a URL in a `TextBox` object. (20)

--- *End of Examination* ---