# UNIVERSITY OF LONDON

# GOLDSMITHS COLLEGE

## B. Sc. Examination 2013

## Computing

## IS51008B Introduction To Programming

**Duration: 2 hour 15 minutes**

**Date and time:**

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*This paper is in two parts: part A and part B. There is one question in part A and 3 in part B. You should answer the one question from part A and two questions from part B. Your answers to part A and part B should be written in separate answer books.*

*Full marks will be awarded for complete answers to a total of three questions, one from part A and two from part B. The question in part A carries 20 marks. Each question in part B carries 10 marks. The marks for each part of a question are indicated at the end of the part in* [.] *brackets.*

*The first few sections of each question in part B are multiple choice. You should choose one and only one answer and write down the letter of your chosen answer*

*There are 40 marks available on this paper.*

*No calculators should be used.*

**THIS PAPER MUST NOT BE REMOVED**
**FROM THE EXAMINATION ROOM**

# PART A

**Question 1**

This question relates to the mini-project that you did in the second term.

(a) Briefly describe your project [2]

(b) Describe a part of your program in which you used either a for loop or an if statement. Explain what you were trying to achieve, why you used the construct and how you used it. [8]

4 marks will be awarded for the quality of description and 4 for the quality of the code described.

(c) Write brief documentation for each of the major classes in your project. For each class describe what it does and what other classes it interacts with. The documentation should be aimed at other programmers who need to work on your project. If you did not use classes document the major functions. [10]

5 marks will be awarded for the quality of description and 5 for the quality of the code described.

# PART B

**Question 2**

Parts (a) to (d) of this question are multiple choice. Please choose only *one* answer and write down the letter corresponding to that answer.

(a) What does the new keyword do? [1]

a) create a new object or array
b) create a new int or float
c) create a new loop
d) create a new processing window

(b) You have created a prototype of a game which includes a single enemy. You now want it to have many enemies. What would you use to achieve this? [1]

a) an array
b) an if statement
c) a class
d) the draw function

(c) Which of the following lines of code is correct? [1]

a) int i = "five";
b) int 3 = i;
c) int i = 3;
d) int [] i = 3;

(d) Which of the following for loops correctly iterates through all the elements of the array a? [1]

a) for (int i = 0; i <= a.length; i ++)
b) for (int i = 0; i => a.length; i ++)
c) for (int i = 0; i < a.length; i ++)
d) for (int i = 0; i = a.length; i ++)

(e) Playlists are a popular feature in music apps. Users can select a series of their favourite songs to be played in turn. Design a class to represent a playlist including member variables, functions and an outline description of how it might be implemented [6]

**Question 3**

Parts (a) to (d) of this question are multiple choice. Please choose only *one* answer and write down the letter corresponding to that answer.

(a) What is a for loop? [1]

a) a large block of memory containing binary data

b) a type of audio file

c) a way or repeating a piece of code a number of times

d) a way of passing information into a function

(b) You are writing a music player. Which of the following would you NOT represent as a class? [1]

a) a tune

b) the user interface buttons

c) a playlist

d) pausing the song

(c) The following code is supposed to animate a circle moving across the screen, but it does not work. How should it be fixed? [1]

```
1  int posX = 0;
2
3  void setup()
4  {
5          size(640, 480);
6  }
7
8  void draw()
9  {
10          background(255);
11          fill(0);
12          ellipse(posX, height/2, 20, 20);
13          posX += 0.1;
14 }
```

a) posX should be a float

b) posX should be a class

c) background should be called in setup

d) Line 7 should be called before line 6

(continued overleaf)

(d) What would you write in place of XXX to make the Processing screen turn blue when the mouse is in the bottom half of the screen? [1]

```
1           if(XXX)
2           {
3                   background(0, 0, 255);
4           }
5           else
6           {
7                   background(255, 0, 0);
8           }
```

a) mouseY >= height/2

b) mouseY <= height/2

c) mouseY = height/2

d) mouseY == height/2

(e) A fellow student has posted the following question on a forum. Answer the question as helpfully as you can. [6]

Hi, I am trying to make a game with many enemies, but it won't run. What is wrong? Any suggestions for improvement?

```
1  Enemy [] enemies;
2
3  void setup()
4  {
5           size(400, 600);
6           enemies = new Enemy[3];
7  }
8
9  void draw()
10 {
11          enemy[1].y += 1;
12          enemy[2].y += 2;
13          enemy[3].y += 3;
14
15          ellipse(enemy[1].x, enemy[1].y, 20, 20);
16          ellipse(enemy[2].x, enemy[2].y, 20, 20);
17          ellipse(enemy[3].x, enemy[3].y, 20, 20);
18 }
```

**Question 4**

Parts (a) to (d) of this question are multiple choice. Please choose only *one* answer and write down the letter corresponding to that answer.

(a) What does an int variable represent? [1]

a) a whole number

b) a fractional number

c) an image

d) a list of numbers

(b) You are writing a photo management app. Which of the following would be a member function of the album class? [1]

a) an array of photos

b) adding a photo

c) resizing a photo

d) the total number of albums

(c) What is wrong with the following code? [1]

```
1 float [] a = new array[10];
2 for(int i = 0; i <= a.length; i++)
3         a[i] = 10;
```

a) You cannot assign an integer to an element of a float array

b) The for loop carries on after the end of the array

c) There should be a semi-colon at the end of line 2

d) You can't call an array by a single letter name

(continued overleaf)

(d) If you had the class Ball defined below how would you create a new object of that class? [1]

```
1  class Ball{
2          float posX, posY;
3          float velX, velY;
4
5          Ball(int x, int y)
6          {
7                  posX = x;
8                  posY = y;
9                  velX = random(-2,2);
10                 velY = random(-2,2);
11         }
12 }
```

a) Ball ball = Ball.create();

b) Ball ball = new Ball();

c) Ball ball.posX = 3;

d) Ball ball = new Ball(100, 100);

(e) Swiping is a popular gesture on touchscreen devices for photo browsing. Moving your finger rapidly across the screen results in the photo viewer moving to the next image. How would you implement this type of interface in Processing (assuming that touch positions appear in the mouseX and mouseY variables)? Give examples of code (these do not have to be completely syntactically correct). [6]