

W211/103C, W228/103C, W282/103C



DUBLIN INSTITUTE OF TECHNOLOGY

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**DT211 BSc. (Honours) Degree in Computing**  
**DT228 BSc. (Honours) Degree in Computer Science**  
**DT282 BSc. (Honours) Degree in Computer Science**  
**(International)**

**Year 1**

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**WINTER EXAMINATIONS 2014/2015**

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**PROGRAM DESIGN [CMPU1024]**

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TUESDAY 6<sup>TH</sup> JANUARY

4.00 P.M. – 6.00 P.M.

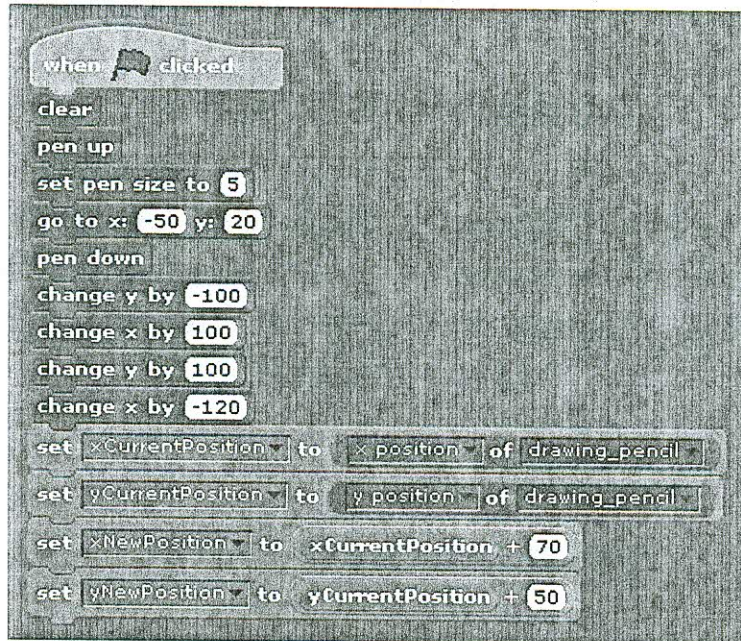
TWO HOURS

QUESTION 1 IS **COMPULSORY**.  
ANSWER QUESTION 1 **AND** TWO OF THE OTHER THREE QUESTIONS.

1. (a) What are the five stages in a program design process?

(5 Marks)

(b) For the following given code written in Scratch, when the green flag is clicked, what would be drawn on the stage of the programming editor?



(5 Marks)

(c) What are the eight categories of programming institutions in SCRATCH?

(5 Marks)

(d) What are the five basic symbols used in flowcharts? For each symbol, give its name and the corresponding function.

(5 Marks)

(e) What is universal design?

(5 Marks)

(f) What are test cases? What types of test cases would you generally expect to see in a test plan?

(5 Marks)

(g) Express the algorithm "Read in two numbers, call them A and B. If A is bigger than B, print out A, otherwise print out B." using a flowchart.

(5 Marks)

(h) Express the algorithm "Prompt the terminal operator for the maximum and minimum temperature readings on a particular day, accept those readings as integers, calculate and display to the screen the average temperature." using Pseudocode.

(5 Marks)

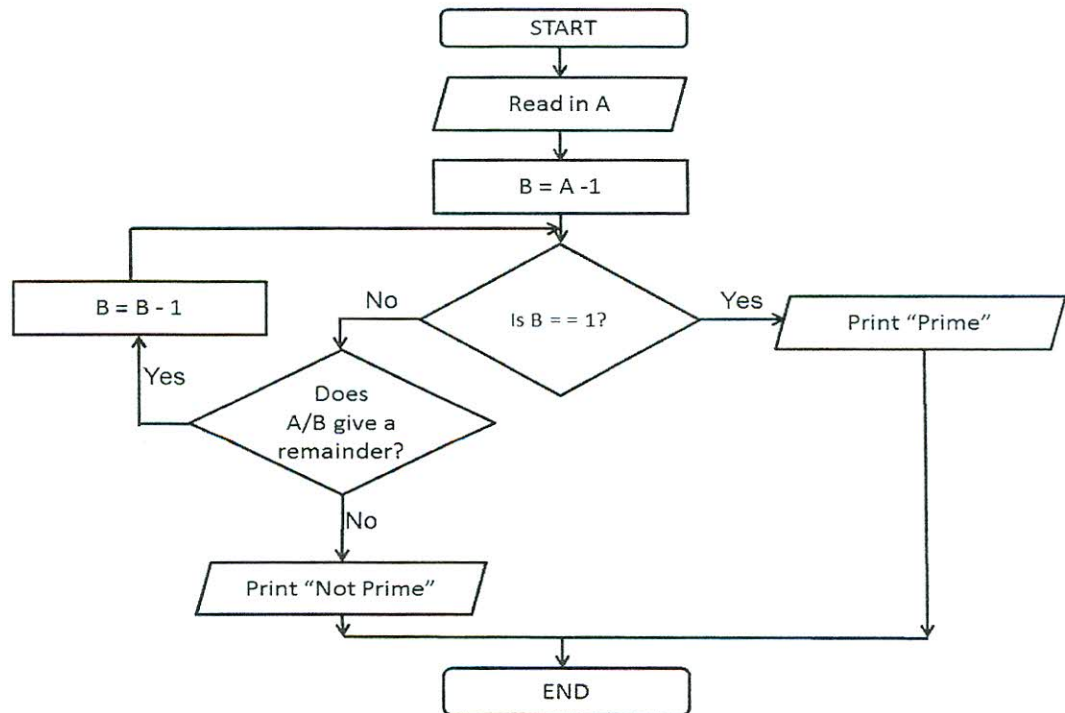
2. (a) Express the following as a flowchart:  
Calculate  $2^4$  using a loop approach.

(15 Marks)

- (b) Express the following as a flowchart:  
Generate a random number between 1 and 10, ask the user to guess the number or enter 0 to exit. Make sure error handling and user interactions are included in the flowchart.

(15 Marks)

3. (a) Express the following flowchart as Pseudocode:



(15 Marks)

- (b) Express the following using Pseudocode:

A program is required to read a customer's name, a purchase amount and a tax code. The tax code has been validated and will be one of the following:

- 0 tax exempt (0%)
- 1 sales tax (17%)
- 2 special sales tax (20%)

The program must then compute the sales tax and the total amount due, and print the customer's name, purchase amount, sales tax and total amount due.

(15 Marks)

4. (a) Create a Use Case Diagram for the following scenario:

Non-registered users of facebook can view publically available profiles, and they can register for facebook. Registered users of facebook can also view publically available profiles, can log in, and then look at friends' updates, and update their own profiles, and post on walls, and add an App, and finally log out.

**(16 Marks)**

- (b) Explain the Seven Principles of Universal Design.

**(14 Marks)**