DUBLIN INSTITUTE OF TECHNOLOGY
KEVIN STREET, DUBLIN 8.

BSc. (Honours) Degree in Computing

Year 1

Semester 1 Examination
Winter 2013/2014

PROGRAM DESIGN

DT211-1

Dr. Q. Wang
Dr. D. Lillis

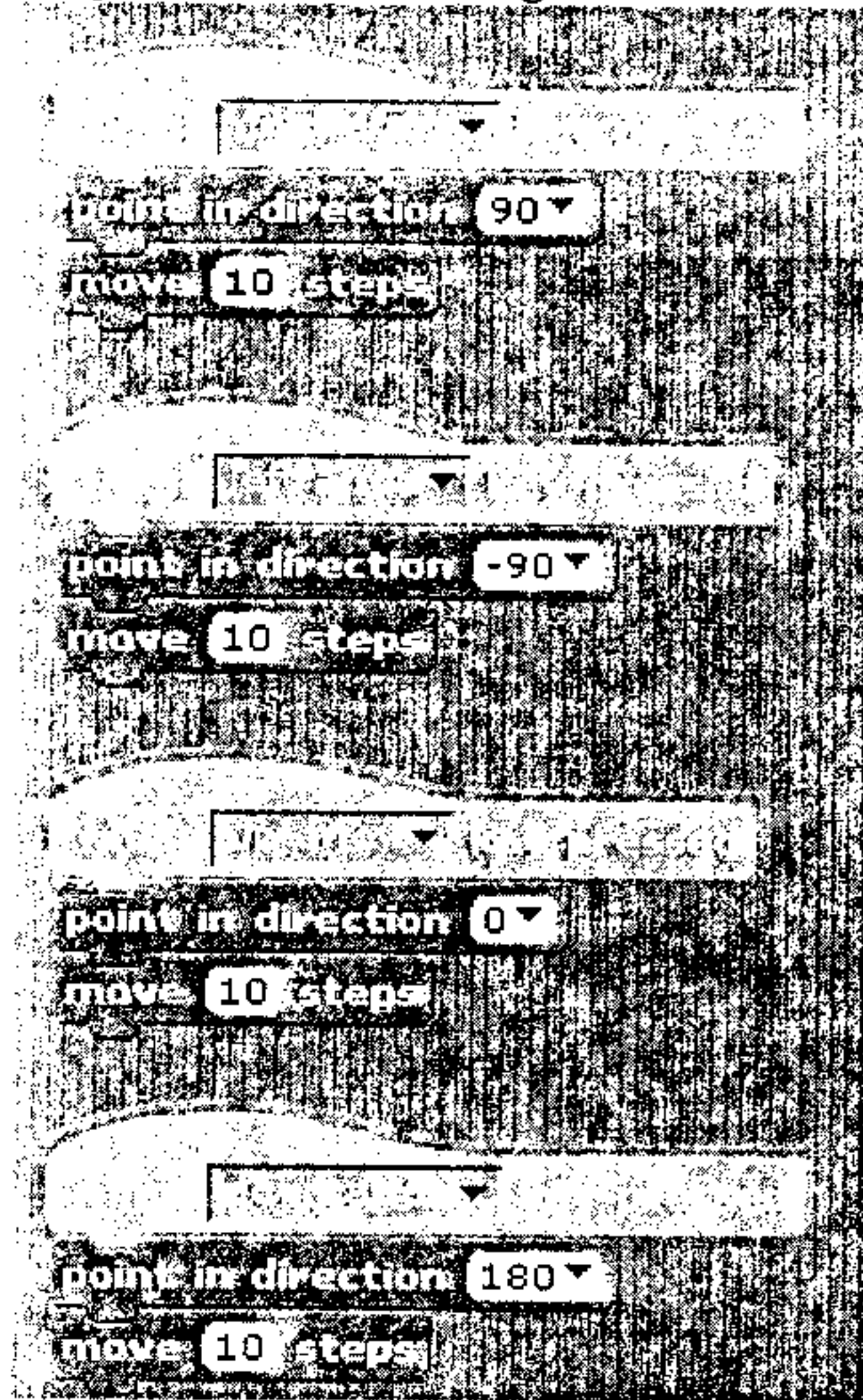Tuesday 14th of January 2014

4.00 p.m. – 6.00 p.m.

Time Allowed: 2 hours

Question 1 is **compulsory**
Answer question 1 **and** two of the other three questions

1. (a) Describe with a diagram the most basic program design.

(5 Marks)

(b) Explain the following code written in SCRATCH Programming Language.

(5 Marks)

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

(5 Marks)

(d) What are the advantages and disadvantages of flowcharts?

(5 Marks)

(e) What is the premise behind 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 "Print out the numbers 1 to 50" using flowcharts.

(5 Marks)

(h) Express the algorithm "Print the average of 3 numbers" using Pseudocode.

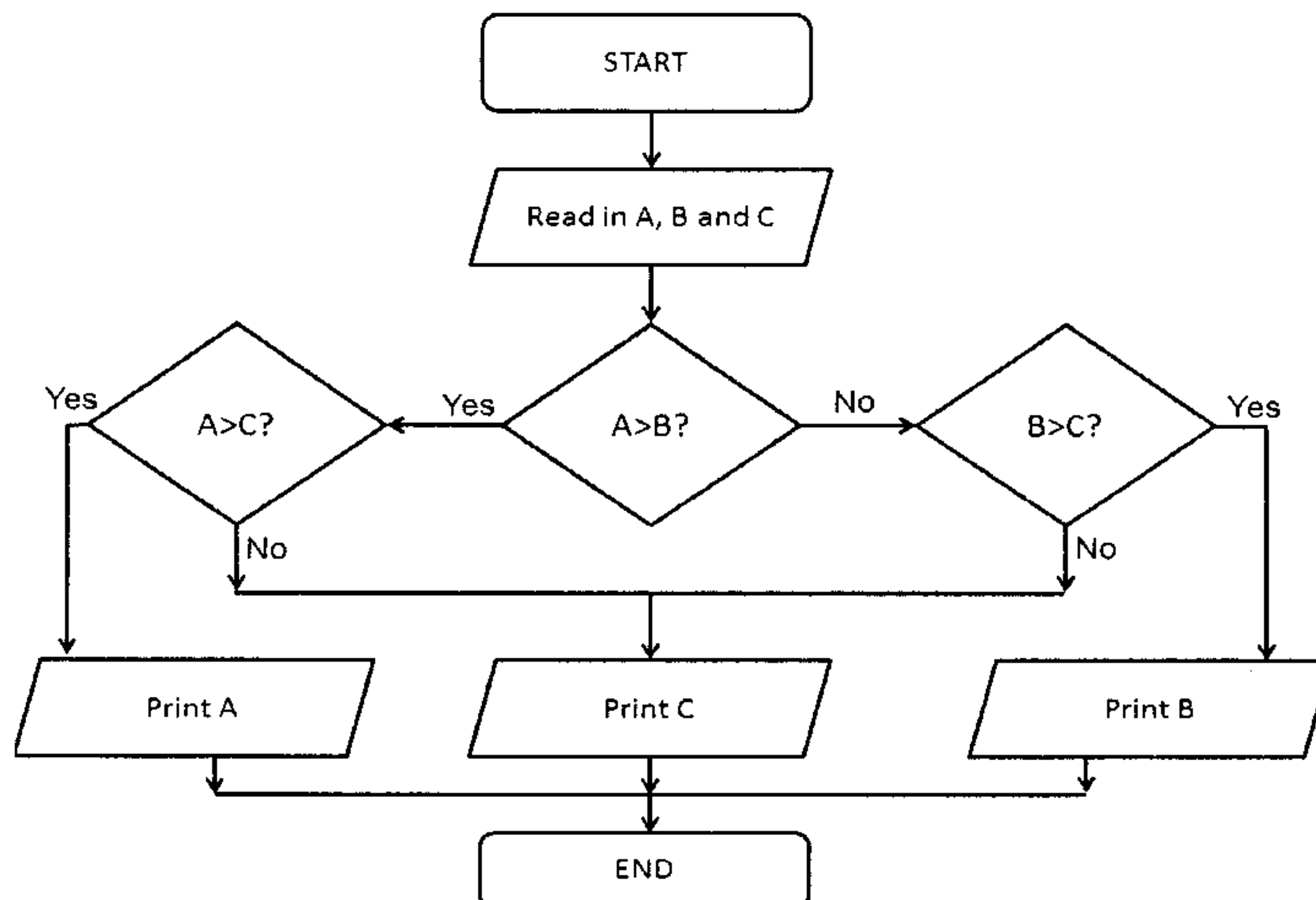**(5 Marks)**

2. (a) Express the following as a flowcharts:
Number of hours worked over 40 are considered as overtime, and these hours are paid at 1.5*hourly rate. Calculate pay with overtime.

(15 Marks)

(b) Express the following as a flowcharts:
Read in a number and check if it's a prime number.

(15 Marks)

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

(15 Marks)

(b) Express an algorithm to get two numbers from the user (dividend and divisor), testing to make sure that the divisor number is not zero, and displaying their quotient using Pseudocode.

(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)