DUBLIN INSTITUTE OF TECHNOLOGY

DT211C BSc. (Honours) Degree in Computer Science (Infrastructure)

DT228 BSc. (Honours) Degree in Computer Science

DT282 BSc. (Honours) Degree in Computer Science (International)

Year 1

WINTER EXAMINATIONS 2017/2018

PROGRAM DESIGN [CMPU1024]

Dr. Seán O'Leary
Dr. Deirdre Lillis

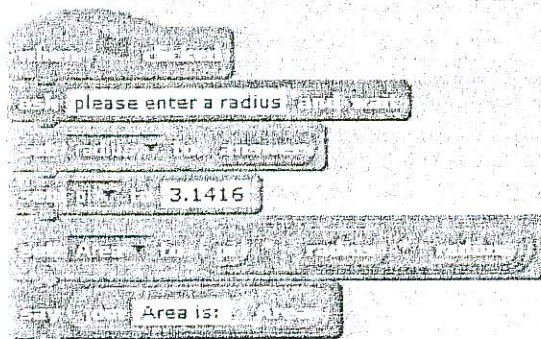Monday 8ᵀᴴ January   9.30 a.m. – 11.30 a.m.

Two Hours

Instructions to candidates
Question 1 is compulsory
Answer Question 1 and two of the other three questions

1. (a) What are some benefits of using pseudocode for designing programs?

(5 Marks)

(b) Express an algorithm in pseudocode that reads in 3 numbers and prints their mean (average) value.

(5 Marks)

(c) What are test cases and what is their purpose? What test cases could be used for the program in part (b) above?

(5 Marks)

(d) Draw a flowchart that reads in the age of a user and prints 'over 18' if the age entered is over 18 and 'under18' if it is less than 18.

(5 Marks)

(e) Briefly explain how the Agile Software Development Methodology involves the customer in the development process.

(5 Marks)

(f) 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 pseudocode.

(5 Marks)

(g) Express the algorithm "Ask a user to input the highest and lowest temperature readings on a particular day, assign the two reading to variables and output the difference between the highest and lowest readings." using a flowchart.

(5 Marks)

(h) Explain the following code written in Scratch.

(5 Marks)

2. (a) Given an Array of 20 random numbers (A[20] type integer) draw a flow chart that uses a loop to calculate the mean value of the array elements.

(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. Initialise the random number only once at the beginning of the game and give the user 3 guesses before ending the game. Include user interaction and error handling in the flowchart.

3. (a) Express the following in pseudocode.
Given an Array of 20 integers (A[20] type integer) sorted in ascending order find the two integers closest in value and print out these two integers (if there are more than one pair of integers with the same difference in value chose the first instance in the array).

(20 Marks)

(b) Construct a program in pseudocode that will compute the sum of the integers 101 to 1000 and print the result.

(10 Marks)

4. (a) Create a use case diagram for an ATM system with the following specifications:
Using the ATM a bank customer can check their balance, pay a fee, withdraw money and they have the option of receiving a receipt for the last two options. A technician can perform maintenance and repair, and a bank clerk can replenish cash in the ATM.

(15 Marks)

(b) Give 3 advantages and 3 drawbacks of the use of persona in software design.

(15 Marks)

COLLEGE EXAMINATIONS

AMENDMENTS TO EXAMINATION QUESTION PAPER

COURSE REF: _24C-228-282-1_   VENUE: _A/57._

SUBJECT: PROG DESIGN.

DATE: 8/1/18

TIME: . 10:20

SIGNED: _Dan Carroll._

INSTRUCTIONS:

SKIP Q 1(d) and THIS WILL BE ALLOWED
FOR WHEN MARKING.