**DUBLIN INSTITUTE OF TECHNOLOGY**

###### KEVIN STREET, DUBLIN 8.

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# SAMPLE PAPER

**Year 1**

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## Semester 1 Examination

## Winter 2011/2012

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##### Program Design

Mr. D. Gordon

Dr. D. Lillis

Date

Time

Time Allowed: 2 hours

Question 1 is **compulsory**

Answer question 1 **and** two of the other three questions

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| **1.** | **(a)** | Explain the importance of the following people to computers:  (i) Al-Jazari  (ii) John Napier  (iii) Wilhelm Schickard  (iv) Blaise Pascal  (v) Gottfried Leibniz  4 marks each.    **(4 \* 5 Marks)** |
|  | **(b)** | Explain the importance of the following ideas to computers:  (i) Ishango bones  (ii) Antikythera Mechanism  (iii) Schickard Clock  (iv) Stepped Reckoner  (v) Jacquard Loom  4 marks each.    **(4 \* 5 Marks)** |

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| **2.** | **(a)** | Explain the benefits of use pseudocode for designing programs.  **(5 Marks)** |
|  | **(b)** | Express the following scenarios as pseudocode:  **(i)** An algorithm to print out the biggest of five inputted numbers.  **(ii)** An algorithm to print out the smallest of three inputted numbers.  **(iii)** An algorithm to print out the smallest of four inputted numbers.  **(iv)** An algorithm print out the sum of the first 5 numbers.  **(v)** An algorithm to print out the difference of the smallest and biggest of three numbers inputted.  5 marks each.    **(5 \* 5 Marks)** |

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| **3.** | **(a)** | Explain what is meant by the Spiral Model Methodology, and comment on computer scientist Barry Boehm's view of this model.  **(5 Marks)** |
|  | **(b)** | Explain each of the following stages of the Spiral Model:  (i) Risk Analysis  (ii) Operational Prototype  (iii) Detailed Design  (iv) Requirements Validation  (v) Unit Test  5 marks each.    **(5 \* 5 Marks)** |

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| **4.** | **(a)** | Express the following Pseudocode as a Flowchart:  PROGRAM Print1to5:  A = 1;  WHILE (A != 6)  DO Print A;  A = A + 1;  ENDWHILE;  END.  **(15 Marks)** |
|  | **(b)** | Express the MergeSort algorithm in Pseudocode.    **(15 Marks)** |