RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B.Sc. (Information and Communication Technology) Degree
Second Year - Semester II Examination – October/November 2017

ICT 2408 – COMPUTER ORGANIZATION AND ARCHITECTURE

Time: Three (3) hours

Answer All questions

1. (a) What are the main differences between First and Second generations of computers? [4 Marks]
   (b) Write a short note on "stored program concept". [4 Marks]
   (c) Explain how the Numbers and Instructions are stored in the IAS computer. [6 Marks]
   (d) On the IAS computer, describe the process that the CPU must undertake to read a value from memory in terms of what is put into the MAR, MBR, Address Bus, Data Bus and Control Bus. [6 Marks]

2. (a) Describe the advantages of software programming over hardwired programming. [4 marks]
   (b) What is an interrupt? Explain the use of interrupts. [4 marks]
   (c) How does the processor handle an interrupt request? Draw the basic instruction cycle with interrupts. [6 marks]
   (d) Explain how multiple interrupts occur and how to handle them. [6 marks]

3. (a) What are CPU registers? How are they useful in instruction execution? [6 marks]
   (b) Explain two design issues related to general purpose registers of CPU. [4 marks]
   (c) What is the use of Condition Code register? [4 marks]
   (d) Briefly explain the functions of any two "Control and Status Registers" of CPU that are essential to instruction execution. [6 marks]

4. (a) What do you mean by instruction format? What is instruction length? [5 marks]

(b) Discuss the advantages and disadvantages of instructions having more addresses. [4 marks]

(c) In most cases, there is no explicit reference to the next instruction in instruction formats. Explain why? [5 marks]

(d) Design an 8-bit instruction format that allows 4 two-operand instructions for a machine with 8 registers. [6 marks]

5. (a) Briefly explain the following memory access methods and give examples for each.
   i. Direct Access.
   ii. Random Access. [6 marks]

(b) What is the major design objective of any memory system? Briefly explain how this objective is achieved. [5 marks]

(c) What is cache memory? Explain its purpose. [4 marks]

(d) Explain RAID2 with its advantages and disadvantages. [5 marks]

END