KIBABII UNIVERSITY COLLEGE

JANUARY – APRIL SEMESTER EXAMINATIONS - 2014

CSC 321 COMPUTER ARCHITECTURE

MAIN PAPER

Instructions:

Answer Question 1 and two questions from section B. Time: 2 Hours

SECTION A (Compulsory – 30 Marks)

QUESTION 1

a) Explain each of the following terms as used in computer architecture:

(i) Handshaking (2 Marks)

(ii) Buffering (2 Marks)

(iii) Port (2 Marks)

b) Work out each of the following number base conversions:

(i) 2365.756_{10} to binary (3 Marks)

(ii) $3DEF_{16}$ to decimal (3 Marks)

(iii) 1110100011.1101_2 to decimal. (4 Marks)

c) Suppose thirty people live in an apartment building. These are the following ages:

58 30 37 36 34 49 35 40 47 47
39 54 47 48 54 50 35 40 38 47
48 34 40 46 49 47 35 48 47 46
Make a line plot of the ages. (5 Marks)

d) Explain the three types of computer buses. (9 Marks)

SECTION B (Attempt any TWO Questions from this section – 40 Marks)

QUESTION 2

Explain each of the following RAID Levels:

a) RAID Level 2 (5 Marks)
b) RAID Level 3 (5 Marks)
c) RAID Level 4 (5 Marks)
d) RAID Level 6 (5 Marks)

QUESTION 3

a) Explain the concept of interleaved memory, giving an example. (8 Marks)

b) Explain, with the help of a diagram, the main memory addressing considering a 96-bit memory with 8-bit, 12-bit and 16-bit word lengths. (12 Marks)

QUESTION 4

a) Consider a task that adds two numbers, held in memory locations designated by B and C and stores the result in memory location designated by A.

A = B + C

Write down the assembly instruction for the task of adding two numbers. (8 Marks)

b) An assembly instruction is divided into a number of instruction fields that encode a different piece of information for the CPU. Explain diagrammatically each of the fields. (12 Marks)

QUESTION 5

a) (i) Explain with the help of a diagram, interrupt processing. (4 Marks)

(ii) Explain four interrupt types. (8 Marks)

b) Discuss the concept of interleaving in terms of computer memory management. (8 Marks)