SLIATE

SRI LANKA INSTITUTE OF ADVANCED TECHNOLOGICAL EDUCATION

(Established in the Ministry of Higher Education, vide in Act No. 29 of 1995)

Higher National Diploma in Information Technology

First Year, First Semester Examination – 2016

HNDIT1104-Data Representation and Organization

Instructions for Candidates:	No. of questions : 05
Answer Only Four questions	No. of pages : 03
All questions carry equal marks.	Time : **Two hours**

Q1

i. Compare the terms **Data** and **Information** (04 Marks)

ii. Name four basic data types available in Computer (04 Marks)

iii. Express the following units in bits. (04 Marks)

a. Nibble

b. Word

iv. Positional Number Systems also name as Weighted Number System. Give two examples for it. (04 Marks)

v. Write the following numbers as sum of product using appropriate weights. (04 Marks)

a. 245.56_{10}

b. $BA0_{16}$

vi. Convert the following numbers into the given number system (05 Marks)

a. Convert 79.5_{10} to Binary

b. Convert 110.1_8 to Decimal

(Total 25 marks)

Q2

i. Convert the following numbers into given number system? (12 Marks)

a. $(4768)_{10}$ into hexadecimal

b. $(F4C)_{16}$ into decimal

c. $(426)_{10}$ into an octal

d. 362.35_8 into a decimal

e. 0.10111_2 into an octal

f. 0.100110101_2 into a hexadecimal

ii. Convert the following hexadecimal numbers into equivalent octal numbers. (04 Marks)

a. $A72E_{16}$
b. $4.BF85_{16}$

iii. Convert the following octal numbers into equivalent hexadecimal numbers. (04 Marks)

a. $(247)_8$
b. $(36.532)_8$

iv. Convert the following numbers into Binary Numbers (05 Marks)

a. $79.EA_{16}$
b. $7A.F8_{16}$
c. 0.56_8

(Total 25 Marks)

Q3

i. Perform following binary adding operations (04 Marks)
   a. 01011010 + 00111101
   b. 00110011 + 01111110

ii. Perform following binary subtraction operations (04 Marks)
   a. 10110110 - 10101001
   b. 11101101- 10100101

iii. Perform following binary multiplication operations (04 Marks)
   a. 00010110*111
   b. 00011101*1010

iv. Perform following binary division operations (04 Marks)
   a. 111011/11
   b. 101010/101

v. Convert to Binary and then perform the binary operations of the following. (09 Marks)
   a. $123_{10} + 47_{10}$
   b. $137_8 + 231_8$
   c. $CD_{16} - 1F_{16}$

(Total 25 Marks)

Q4.

(i) Represent the following decimal numbers in 8-bit sign magnitude format.
   a) +37
   b) -37 (06 marks)

(ii) What are the drawbacks of sign magnitude representation? (02 marks)

(iii) Add decimal 17 to decimal -8 using 8-bit one's complement addition. Verify your answer. (05 marks)

(iv) Find the 8-bit Two's complement representation of -6 (04 marks)

(v) Evaluate the following expressions by using binary two's complement method
   a) Add -9 to 5
   b) Add -9 to -5 (08 marks)

(Total 25 Marks)

Q5.

i. Express $\mathbf{9730_{10}}$ number in BCD format (08 Marks)

ii. Express word "**dro**" using ASCII format.(hint ASCII value of **d** is 100) (09 Marks)

iii. Display 10.375 using IEEE single-precision binary floating-point format: binary32 (08 Marks)

(Total 25 Marks)