



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 – 2018

HNDIT 1104-Data representation and organization

Instructions:

All Questions carry equal Marks

Answer any four Questions

No. of questions: 05

No. of pages : 03

Time : Two hours

Q1)

- I. Compare and contrast analog and digital signal. (02 marks)
- II. Convert following decimal numbers into binary number system. (06 marks)
 - a. 39
 - b. 146
 - c. 0.25
- III. Convert following decimal numbers into octal number system. (06 marks)
 - a. 78
 - b. 275
 - c. 0.0625
- IV. Convert following decimal numbers into hexadecimal number system. (06 marks)
 - a. 55
 - b. 200
 - c. 0.45
- V. Convert following data units into bits. (**Hint:** Answers would be given as multiples of numbers. Fully simplified answers are not required.) (05 marks)
 - a. 512 bytes
 - b. 50KB(kilobytes)
 - c. 650MB(Megabytes)
 - d. 2.5GB(Gigabytes)
 - e. 0.5 TB(Terabytes)

(Total 25 marks)

Q2)

- I. Give two examples for non-positional number system. (02 marks)
- II. Draw the truth tables for following logic gates. (06 marks)
 - a. AND
 - b. OR
 - c. XOR
- III. Write the following numbers as polynomial evaluation. (06 marks)
 - a. 125.45_{10}
 - b. 462.125_8
 - c. $AB5.6F_{16}$
- IV. Convert following binary numbers into octal and hexadecimal numbers. (06 marks)
 - a. 110111
 - b. 1111000110
 - c. 101111.0011
- V. Convert following numbers into decimal number system (05 marks)
 - a. 10111.11_2
 - b. $AB.1C_{16}$

(Total 25 marks)

Q3)

- I. Name two disadvantages in 8-bits sign magnitude representation. (02 marks)
- II. Convert following numbers into 8 bits sign magnitude form. (06 marks)
 - a. 43
 - b. -29
 - c. -124
- III. Perform the following binary calculations. (08 marks)
 - a. $11101+1010$
 - b. $10001-100$
 - c. $1011*11$
 - d. $11001/101$
- IV. Perform the following calculations. (09 marks)
 - a. 75_8+45_8
 - b. $CD_{16}+BE_{16}$
 - c. $AB_{16}-6F_{16}$

(Total 25 marks)

Q4)

- I. Convert following numbers into 8 bits one's complements. (04 marks)
 - a. 23
 - b. -89
- II. Convert following numbers into two's complements form. (04 marks)
 - a. 63
 - b. -110
- III. Convert following two's complement binary number into decimal format. (04 marks)
 - a. 11101100_2
 - b. 11110111_2
- IV. Perform following arithmetic calculation with 8-bits sign magnitude. (08 marks)
 - a. $(-65)+(-33)$
 - b. $(-76)+56$
- V. Perform following calculation with two's complement. (05 marks)
 $-39+92$

(Total 25 marks)

Q5)

- I. Name two data types used in the computer. (02 marks)
- II. The following numbers in 4 bits BCD code. Identify the equivalent decimal value. (06 marks)
 - a. 101010110
 - b. 10000110111
 - c. 10010110011000
- III. Express the word "ATI" using ASCII format.(hint ASCII values of **E** is **69**) (06 marks)
- IV. Display 79.625 using IEEE single-precision floating point format. (06 marks)
- V. Convert following IEEE single precision format into decimal value. (05 marks)

1	01111100	110000000000000000000000
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(Total 25 marks)