NALANDA COLLEGE – COLOMBO 10
G.C.E. (A/L) EXAMINATION – 2020

Unit Test
Unit 3

**Information & Communication Technology**

Index Number/ Name : ……..……



## Part - 1

**A - Select the most suitable answer for the following questions**

1) Which of the following numbers is equivalent to $1AF_{16}$ ?
   (i). $110101111_2$ (iii). $657_8$ (v). None of the above
   (ii). $431_{10}$ (iv). All of the above

2) $101110_2 + 10_{10} =$
   (i). $72_8$ (iii). $38_{10}$ (v). None of the above
   (ii). $1110000_2$ (iv). All of the above

3) The most significant digit (MSD) and the least significant digit (LSD) of the number 0.25730 are respectively.
   (i). 0 and 0 (iii). 3 and 2 (v). 3 and 7
   (ii). 2and 3 (iv). 2 and 5

4) 10310 and 25010 are equivalent respectively to
   (i). 1478 and FA16 (iii). 14716 andFB16 (iv). 11316 and 3728
   (ii). 4238 and 3718 (v). 4218 and FA16

5) Consider the following three numbers in decimal, octal and hexadecimal notations respectively.

   A= $1011_2$
   B = $14_{10}$
   C= $1100_8$

Which of the above is / are equivalent to C in Hexadecimal notation?

(vi). A and B only
(vii). A only
(viii). B only
(ix). C only
(x). B and C only

6) What is the decimal equivalent to binary $00.00001_2$?

(i). $0.09_{16}$
(ii). $0.03125_{10}$
(iii). $0.03152_{10}$
(iv). $0.010_{16}$
(v). $0.03_8$

7) What is the two's complement representation of 67, if an integer is represented by 8 bits?

(i). $111100_2$
(ii). $111101_2$
(iii). $00111100_2$
(iv). $00111101_2$
(v). $00000011_2$

8) "In ASCII encoding ..... bits are used for storing a character."

Select the correct answer to complete the above sentence.

(i). 6 bits
(ii). 1 bit
(iii). 16 bits
(iv). 1 byte
(v). bits

9) Which of the following numbers is equivalent to binary number $10111010_2$?

(vi). $186_{10}$
(vii). $156_{10}$
(viii). $AB_{16}$
(ix). $271_8$
(x). $273_8$

10) Which of the following numbers is equivalent to decimal number 125?

(i). $01011101_2$
(ii). $01111101_2$
(iii). $174_8$
(iv). $7B_{16}$
(v). $6C_{16}$

11) What is the binary representation of $8.25_{10}$ ?

(i). $8.25_{16}$
(ii). $1000.01_2$
(iii). $1000.11_2$
(iv). $10.3_8$
(v). $9.4_8$

12) Consider the following statements regarding character representation:

(i). ASCII (American Standard Codes for Information Interchange) normally uses 8 bits to store each character.
(ii). UNICODE normally uses 16 bits to store each character.
(iii). BCD is a 8 bit code used for coding numeric values.

Which of the above statements can be considered true?

(i). A only
(ii). B only
(iii). C only

(iv). A & B only (v). B & C only

13) NOT operation of the value $111001_2$ will be:

(i). $111010_2$ (iii). $000110_2$ (v). $101010_2$
(ii). $010101_2$ (iv). $1111010_2$

$AB_{16} + 53_8 =$ (.....)$_8$

(i). 326 (iii). 247 (v). 337
(ii). 427 (iv). 47

14) What is the decimal value equivalent to 0001 $101.01_2$?

(i). 13.5 (iii). 13.05 (v). 13.25
(ii). 12.15 (iv). 12.25

15) $101_2 + 101_8 + 1011_6 =$

(i). $303_{10}$ (iii). $303_8$ (v). $327_8$
(ii). $303_{16}$ (iv). $327_{10}$

**B- Provide suitable answers for the following questions.**

1) Give 4 methods of character representation
   (i). .....
   (ii). .....
   (iii). .....
   (iv). .....

2) Give 2 advantages and disadvantages of Binary Coded Decimals

   .....
   .....
   .....
   .....
   .....

3) State an advantage of using Two's complement representation of data in computer's tasks.

   .....
   .....
   .....
   .....

4) Convert the following numbers to BCD and hence give the decimal value derived from the BCD value:

   (i). $1000111_2$

   .....
   .....

   (ii). $1111000_2$

   .....
   .....

5) Give an advantage and an disadvantage of the following:

   (i). Fixed point data representation scheme

   .....
   .....

(ii).Floating point data representation scheme

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## Part 2

1.

1) State how to identify whether a 8 bit binary value is a negative value or a positive value.
2) Show the 2's complement of (-42).
3) Calculate 57 - 42 in 2's complement method.

2.

1) Write down the Two's Complement representation of $12_8$ using 8 bits.
2) Write down the Two's Complement representation of $-15_{10}$ using 8 bits.
3) Compute $-15_{10} + 12_8$ using the above representations of 3. , 4

3.

1) Assume that a program represents integers in 8 bit two's complement form. However the results of the computations will be printed in decimal form.
    i. Give the representation of $100_{10}$ in the above program.
    ii. Give the representation of $-20_{10}$ in the above program
    iii. Explain how the computation of $100_{10} - 20_{10}$ done by the device using your representations given in section (i) and (ii) above.
    iv. List the steps necessary to transform the results obtained in section (iii) above into decimal form in order to print the answer.