

**Uva Wellassa University, Sri Lanka**  
**Faculty of Science and Technology**  
**Department of Computer Science & Technology**  
**First Semester Examination March/April 2013**  
**CST111-2 Introduction to Computer Science & Technology**

Time Allowed: Two (2) Hours.  
 Answer all questions.  
 Each question carries 25 mark.

1.
  - a. Define the following terminology.
    - i. Data
    - ii. Information
    - iii. Software
    - iv. Hardware
  - b. What are the basic parts of any computer system?
  - c. Why is the RAM considered as a "Volatile Memory"?
  - d. What are the types of peripheral devices? Specify the purpose of each.
  - e. Explain three types of secondary storage devices that are widely used.
  
2.
  - a. Specify the use of following components.
    - i. PS/2 Adapter
    - ii. Rj45 Connector
    - iii. Parallel-Port connector
    - iv. Serial Port connector
  - b. Explain the Von Neumann Architecture by using a block diagram.
  - c. What is a Computer Network?
  - d. What are the advantages of Computer Networks?
  - e. How can you classify networks based on the Geographical Area? Briefly explain each network structure.

3.

a. Add following binary numbers.

i.  $11001011_2 + 10100_2$

ii.  $10100111_2 + 1001011_2$

iii.  $1001_2 + 1011_2$

iv.  $1101101_2 + 10101_2$

b. Convert following binary values to octal.

i.  $11000100_2$

ii.  $11100101_2$

c. Represent following values in binary form using signed magnitude system. (use 8 bit numbers)

i. -103

ii. -77

iii. +45

iv. +108

d. Represent following numbers in 8 bit 2's complement form.

i. -88

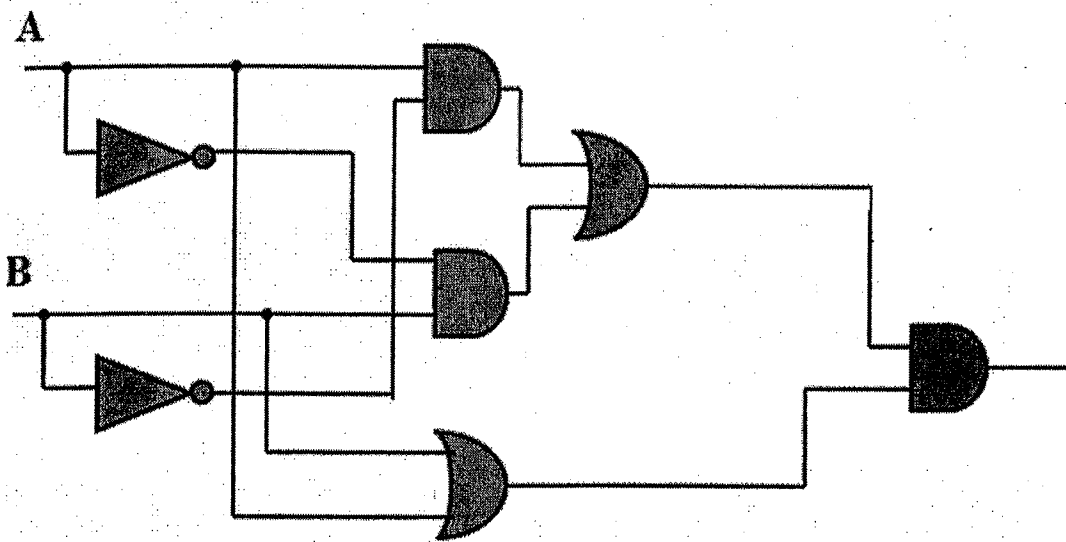
ii. -32

e. Represent the word "Hello World" using 8 bit binary ASCII code. ASCII values of the alphabet are given below.

Symbol	Hexa decimal	Symbol	Hexa decimal	Symbol	Hexa decimal	Symbol	Hexa decimal
A	41	N	4E	a	61	n	6E
B	42	O	4F	b	62	o	6F
C	43	P	50	c	63	p	70
D	44	Q	51	d	64	q	71
E	45	R	52	e	65	r	72
F	46	S	53	f	66	s	73
G	47	T	54	g	67	t	74
H	48	U	55	h	68	u	75
I	49	V	56	i	69	v	76
J	4A	W	57	j	6A	w	77
K	4B	X	58	k	6B	x	78
L	4C	Y	59	l	6C	y	79
M	4D	Z	5A	m	6D	z	7A

4.

- a. Write down the expressions for AND, OR and NOT gates and construct the truth tables for each.
- b. State the De Morgan's theorem in Boolean algebra.
- c. Write the Boolean expression for the following circuit and construct the truth table for the derived expression.



- d. Prove the following expressions using basic laws and axioms in Boolean algebra.
  - i.  $AB + A(B+C) + B(B+C) = B + BC$
  - ii.  $A(A+B) = A$
- e. Draw logic circuits for the following Boolean expressions.
  - i.  $F = \overline{AB} + A(B+C) + B(\overline{B+C})$
  - ii.  $F = AB(A+B)(B+\overline{B})$

