Name : ....

Roll No. : ....

Invigilator's Signature : ....

CS/BCA/SEM-2/BCA-201/2012

2012
COMPUTER ARCHITECTURE AND SYSTEM SOFTWARE

Time Allotted : 3 Hours   *Full Marks :* 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following :

                                            10 × 1 = 10

   i)   Gray code for decimal 12 is

        a)   1100   b)   1011

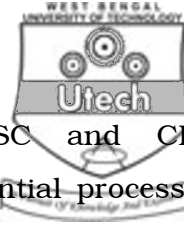   c)   1010   d)   0100.

   ii) 9's complement of 46 is

        a)   54   b)   64

        c)   63   d)   53 .

   iii) BCD numbers express each decimal digit as

        a)   Byte   b)   Nibble

        c)   Bit   d)   ASCII .

iv) A microprocessor has memory locations from 0000 to 7FFF. Each location stores 1 byte. The memory capacity is

    a)   8 k byte   b)   16 k byte

    c)   24 k byte   d)   32 k byte.

v) The transfer operation $P : R_2 \leftarrow R_1$ will be executed only when

    a) $P = 0$ b) $P = 1$

    c) $P > 0$ d) $P < 1$.

vi) The number of multiplexers required to construct a common bus for 8 registers with 4 bits each is

    a)   16   b)   8

    c)   4   d)   2 .

vii) A logical shift is one that transfers .... through the serial input.

    a)   0   b)   1

    c)   either 0 or 1   d)   both (a) and (b).

viii) A computer instruction is a .... code.

    a)   Hexadecimal   b)   Decimal

    c)   Binary   d)   Octal .

ix) DMA stands for

    a)   Digital Memory Address

    b)   Direct Memory Access

    c)   Digital Memory Array

    d)   Dual Memory Arithmetic.

x) The basic computer consists of .... types of
    registers.

    a) 6   b) 8

    c) 9   d) 18 .

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following.   3 × 5 = 15

2. Describe the working principle of binary incrementer.

3. What is meant by random access and sequential access of
    memory devices ? Explain.

4. Briefly describe an instruction execution cycle with proper
    timing diagram.

5. What is locality of reference ? What is biased exponent ?

                                                    2 + 3

6. What are the uses of a System Bus and Data Bus ? How do
    they differ from an Address Bus ?   3 + 2

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following.   3 × 15 = 45

7. What is virtual memory ? What could be the maximum size
    of virtual memory ? Justify. Briefly describe an instruction
    execution cycle with proper timing diagram. Explain the
    Booth's algorithm. Illustrate with example. Briefly discuss
    different types of ROM. Differentiate between Static RAM and
    Dynamic RAM.   3 + 3 + 3 + 3 + 3

8. What are the differences between RISC and CISC processors ? Explain the concepts of sequential processing pipelining and parallel processing with example. What are the elements of a machine instruction ? What is meant by memory access time ? 4 + 6 + 3 + 2

9. What are 16-bit registers available in 8085 microprocessor ? Write about them. What is 'bootstrap loader' program stored in ROM and not in RAM ? What are the elements of machine instruction ? 2 + 3 + 5 + 5

10. What is interrupt ? What is the difference between primary and secondary storage devices ? What is stack ? What is flag ? What is the disadvantage of microprocessor ? What is the difference between microprocessor and the microcontroller ? 2 + 4 + 2 + 2 + 2 + 3

11. Write short notes on any *three* of the following : 3 × 5

   a) Vector Processing

   b) Paging

   c) DMA controller

   d) Cache memory

   e) 4 in 1 multiplexer.