**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

2004     3     [ Turn over

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.