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 :

                                        $10 \times 1 = 10$

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 .

2004   [Turn over

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.

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