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 : $10 \times 1 = 10$

   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 .

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 t ansfers ..... 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 ref renc ? 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 etween primary and secondary storage devices ? What is stack ? What is flag ? What is the disadvantag 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) Pag ng

    c) DMA controller

    d) Cache memory

    e) 4 in 1 multiplexer.