Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/BCA/SEM-2/BCA-201/2013

2013

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 altern tives for any *ten* of 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) Computer registers are designated by

a) capital letters

b) both capital and small letters

c) numerals

d) small letters.

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

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

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

vii) 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.

viii) Both Selective – complement and Clear operations are achieved by .... micro-operation.

a) OR b) AND

c) NOT d) XOR.

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

a) 0 b) 1

c) either 0 or 1 d) both 0 and 1.

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

a) hexadecimal b) decimal

c) binary d) octal.

xi) DMA stands for

a) Digital Memory Address

b) Direct Memory Access

c) Digital Memory Array

d) Dual Memory Arithmetic.

xii) 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. $3 \times 5 = 15$

2. Describe the working principle of binary incrementer.
3. What is virtual memory ? What is locality of reference ? 3 + 2
4. What are the uses of a System Bus and Data Bus ? How do they differ from an Address Bus ? 3 + 2
5. Explain direct and indirect addressing with the help of neat sketch.
6. Why is 'bootstrap loader' program stored in ROM and not in RAM ?

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) What is parallel processing ?
   b) What is arithmetic pipelining ?
   c) What is vect r processing ? Explain how matrix multiplic t on is performed using vector processing.
   d) Discuss Booth's algorithm for binary multiplication using the example of multiplication of two signed numbers +13 and –11. 3 + 3 + (1 + 3) + 5
8. a) What is interrupt ?
   b) Discuss different major types of interrupts.
   c) Point out the differences and similarities between external and internal interrupts. 3 + 8 + 4
9. What are the 16-bit registers available in 8085 microprocessor ? What are the types of CPU organization ? Discuss in brief with example. 5 + 10

10. Explain asynchronous mode of data transfer. Discuss priority interrupt. 10 + 5

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

    a) Stack organization

    b) Memory stack

    c) Addressing mode

    d) Cache memory

    e) First and Second Pass Assembler.

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