

## 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 <br> ( Multiple Choice Type Questions )

1. Choose the correct alternatives 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 7 FFF . 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.

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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) $\quad P<1$.
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) $O R$
b) AND
c) NOT
d) XOR.
ix) A logical shift is one that transfers $\qquad$ through the serial input.
a) 0
b) 1
c) either 0 or 1
d) both 0 and 1 .
x) A computer instruction is a $\qquad$ 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.
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xii) The basic computer consists of ..............Atypes of
registers.

| a) 6 | b) 8 |
| :--- | :--- |
| c) 9 | d) 18. |

(ShoUP - B
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. $\quad 3 \times 15=45$
7. a) What is parallel processing ?
b) What is arithmetic pipelining ?
c) What is vector processing ? Explain how matrix multiplication is performed using vector processing.
d) Discuss Booth's algorithm for binary multiplication using the example of multiplication of two signed numbers +13 and $-11 . \quad 3+3+(1+3)+5$
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. $5+10$

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11. Write short notes on any three of the following :
a) Stack organization
b) Memory stack
c) Addressing mode
d) Cache memory
e) First and Second Pass Assembler.

