|   |                            |                             |   |   | (              | <u>United</u>    | san )             |  |
|---|----------------------------|-----------------------------|---|---|----------------|------------------|-------------------|--|
| Name:   | •••••                      | •••••                       | • |   |                | E                | 3/                |  |
| Roll No.  | :                          |                             |   |   |                | Phones of Knowle | Ge 2nd Explaint   |  |
| Invigila  | tor's S                    | ignature :                  |   | • |                |                  |                   |  |
| CS/BCA/SEM-2/BCA-201/2013   |                            |                             |   |   |                |                  |                   |  |
| 2013  |                            |                             |   |   |                |                  |                   |  |
| COMPUTER ARCHITECTURE AND SYSTEM SOFTWARE                               |                            |                             |   |   |                |                  |                   |  |
| Time Allotted: 3 Hours  |                            |                             |   |   | Full Marks: 70 |                  |                   |  |
|   | Th                         | ne figures in               | n the marg                              | jin indica                              | ite full ma    | rks.             |                   |  |
| Candidates are required to give their answers in their own words        |                            |                             |   |   |                |                  |                   |  |
| as far as practicable.  |                            |                             |   |   |                |                  |                   |  |
| CROUD A   |                            |                             |   |   |                |                  |                   |  |
| GROUP – A<br>( Multiple Choice Type Questions )                         |                            |                             |   |   |                |                  |                   |  |
| 1. Choose the correct alternatives for any <i>ten</i> of the following: |                            |                             |   |   |                |                  |                   |  |
|   | 10000                      | 210 0011000                 | 0.1001110.011                           | 00 101 01.                              | 19 00.001 01   |                  | $0 \times 1 = 10$ |  |
| i)  | Gra                        | Gray code for decimal 12 is |   |   |                |                  |                   |  |
|   | a)                         | 1100                        |   | b)                                      | 1011           |                  |                   |  |
|   | c)                         | 1010                        |   | d)                                      | 0100.          |                  |                   |  |
| ii)   | i) 9's complement of 46 is |                             |   |   |                |                  |                   |  |
|   | a)                         | 54                          |   | b)                                      | 64             |                  |                   |  |
|   | c)                         | 63                          |   | d)                                      | 53.            |                  |                   |  |
| iii) BCD numbers express each decimal d                                 |                            |                             |   |   |                | as               |                   |  |
|   | a)                         | Byte                        |   | b)                                      | Nibble         |                  |                   |  |
|   | c)                         | Bit                         |   | d)                                      | ASCII.         |                  |                   |  |
| iv)   | A n                        | nicroproces                 | ssor has                                | memory                                  | locations      | from             | 0000 to           |  |
| 7FFF. Each location stores 1 byte. The mer                              |                            |                             |   |   |                |                  | memory            |  |
|   | capacity is                |                             |   |   |                |                  |                   |  |
|   | a)                         | 8 k byte                    |   | b)                                      | 16 k byt       | e                |                   |  |
|   | c)                         | 24 k byte                   | <u>:</u>                                | d)                                      | 32 k byt       | e.               |                   |  |

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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) 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 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. 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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- 10. Explain asynchronous mode of data transfer. Discuss priority interrupt.
- 11. Write short notes on any *three* of the following:  $3 \times 5$ 
  - a) Stack organization
  - b) Memory stack
  - c) Addressing mode
  - d) Cache memory
  - e) First and Second Pass Assembler.

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