Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – April/May– 2017**

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| **Code :** | **16CA2003** | **Duration :** | **3Hrs** |
| **Sub. Name :** | **COMPUTER ORGANIZATION AND ARCHITECTURE** | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| Q. No. | Sub Div. | Questions | Course  Outcome | Marks |
| 1. | a. | \_\_\_\_\_\_\_\_\_\_ is a sequence of machine instructions. | CO1 | 1 |
| b. | Which is identified as single general purpose register? | CO1 | 1 |
| c. | List any two registers that holds 12 bits of information. | CO1 | 2 |
| d. | Discuss how the address field of an instruction is represented. | CO1 | 2 |
| e. | A processor has many registers to hold instructions, address, data, etc., - Justify the work of different basic computer registers. | CO1 | 14 |
| (OR) | | | | |
| 2. | a. | EA stands for \_\_\_\_\_\_\_\_\_\_\_\_\_. | CO1 | 1 |
| b. | The registers in the basic computer are connected using a \_\_\_\_\_. | CO1 | 1 |
| c. | List the different parts of a computer instruction. | CO1 | 2 |
| d. | Highlight the significance of a general purpose register. | CO1 | 2 |
| e. | Discuss the common bus systems that connects various registers in detail through suitable diagrams. | CO1 | 14 |
| 3. | a. | \_\_\_\_\_\_\_ of a processor translates from machine instructions to the control signals for the micro-operations that implement them. | CO1 | 1 |
|  | b. | An eight bit opcode can specify \_\_\_\_\_\_ unique instructions. | CO1 | 1 |
|  | c. | D’7I’T3 represents \_\_\_\_\_\_\_\_\_\_\_. | CO1 | 2 |
|  | d. | List the steps involved in executing a machine instruction. | CO1 | 2 |
|  | e. | Discuss in detail the following instructions with suitable examples. |  |  |
|  | i | Functional Instructions | CO1 | 4 |
|  | ii | Transfer Instructions | CO1 | 4 |
|  | iii | Control Instructions | CO1 | 3 |
|  | iv | Input / output Instructions | CO1 | 3 |
| (OR) | | | | |
| 4. | a. | The number of instructions supported by a microprocessor depends on the size of the \_\_\_\_\_\_\_\_\_\_\_ field. | CO1 | 1 |
|  | b. | D7I’T3 represents \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | CO1 | 1 |
|  | c. | Discuss the operations performed by memory reference instructions: AND to AC. | CO1 | 2 |
|  | d. | Draw the control unit of a basic computer. | CO1 | 2 |
|  | e. | Distinguish between hardwired control and micro-programmed control. | CO1 | 6 |
|  | f. | Write the ‘operations performed’ by the central processing unit for the following instructions: |  |  |
|  |  | i. AND reg1, reg2 | CO1 | 2 |
|  |  | ii. CLR reg | CO1 | 2 |
|  |  | iii. ADD reg1, reg2 | CO1 | 2 |
|  |  | iv. INCR reg | CO1 | 2 |
| 5. | a. | INCA stands for \_\_\_\_\_\_\_\_\_\_\_. | CO1 | 1 |
|  | b. | R1 🡨M[A] means \_\_\_\_\_\_\_\_\_\_. | CO1 | 1 |
|  | c. | List the possible operations for Stack. | CO3 | 2 |
|  | d. | Evaluate the following expression using three-address instructions:  X = (A + B) × (C + D). | CO2 | 2 |
|  | e. | Briefly discuss the operations of Control Unit. | CO3 | 8 |
|  | f. | Solve the arithmetic expression using reverse polish notation:  (3 × 4) + (7 × 8) | CO2 | 6 |
| (OR) | | | | |
| 6. | a. | MUX stands for \_\_\_\_\_\_\_\_\_. | CO1 | 1 |
|  | b. | List any two data transfer instructions. | CO3 | 1 |
|  | c. | Write the control word for the micro-operation R1🡨 R2 – R3. | CO1 | 2 |
|  | d. | Bring out the difference between Register Stack organization and Memory Stack Organization. | CO3 | 2 |
|  | e. | List and explain the most common CPU organizations with suitable example. | CO3 | 7 |
|  | f. | Discuss the functionality of Register Stack organization. | CO3 | 7 |
| 7. | a. | An arithmetic processor is the part of a processor unit that executes \_\_\_\_\_\_\_ operations. | CO2 | 1 |
|  | b. | \_\_\_\_\_\_\_\_ of two fixed-point binary numbers in signed-magnitude representation is done by a process of successive shift and add operations. | CO2 | 1 |
|  | c. | Describe the need for control command. | CO3 | 2 |
|  | d. | List any three input devices. | CO3 | 2 |
|  | e. | Perform addition and subtraction with signed 2’s complement data for all possible combinations. | CO2 | 14 |
| (OR) | | | | |
| 8. | a. | The \_\_\_\_\_ most bit of a binary number represents the sign bit. | CO2 | 1 |
|  | b. | \_\_\_\_\_\_\_\_\_\_\_\_ devices attached to the computer are also called as peripherals. | CO3 | 1 |
|  | c. | List any two basic arithmetic operations performed by digital computers. | CO2 | 2 |
|  | d. | Justify the need for ASCII characters. | CO3 | 2 |
|  | e. | Discuss in detail the Booth algorithm for multiplication through suitable examples. | CO2 | 14 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Divices that provide backup storage are called \_\_\_\_\_\_\_\_\_\_\_\_\_. | CO3 | 1 |
|  | b. | ROM stands for \_\_\_\_\_\_\_\_\_\_\_\_. | CO3 | 1 |
|  | c. | Define the concept of Multiprogramming. | CO3 | 2 |
|  | d. | List and explain the possible operating modes of a RAM. | CO3 | 2 |
|  | e. | Write short notes on |  |  |
|  |  | 1. Auxillary Memory. | CO3 | 7 |
|  |  | 1. Cache Memory. | CO3 | 7 |

ALL THE BEST