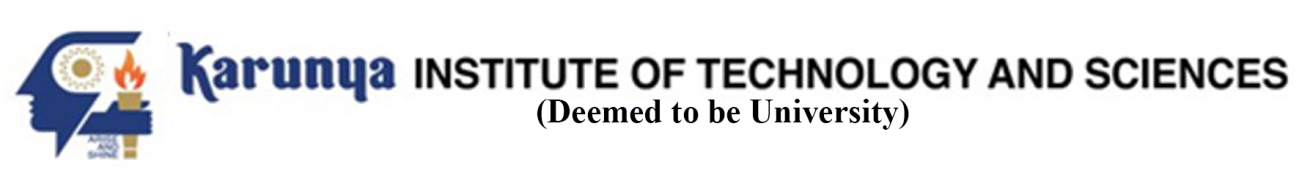
Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov/Dec – 2018**

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| **Code :** | **17CA2003** | **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. | Define effective address with an example. | CO1 | 2 |
| b. | Demonstrate with example direct and indirect addressing. State the number of memory references needed for each type of instruction to bring an operand into the processor register. | CO1 | 10 |
| c. | Identify and state the use of the following register reference instructions with their symbolic representations.  i) CLA ii) CLE iii) CMA iv) CME  v) CIR vi) CIL vii) INC viii) HLT | CO1 | 8 |
| (OR) | | | | | |
| 2. | | a. | State the steps that are followed in an instruction cycle. | CO3 | 4 |
| b. | Explain the microoperations that take place in the fetch and decode phase in an instruction cycle. | CO3 | 6 |
| c. | Prepare a flowchart to determine the type of instruction that is going to be executed. | CO3 | 10 |
|  | | | | | |
| 3. | | a. | Explain the General register organization in the central processing unit with a neat sketch. | CO3 | 10 |
| b. | State the need and use of the control word in CPU with an example | CO3 | 4 |
| c. | Specify the control word to implement the following microoperations.  i) R1 **←** R2 + R3 ii)R1 ← R2 - R3  (operation code for addition is 00010 and subtraction is 00101) | CO4 | 6 |
| (OR) | | | | | |
| 4. | | a. | Anaylse the need and use of stack with reference to  i) Register stack ii) Memory stack. | CO3 | 4 |
| b. | Explain the microoperations involved in  i) Push operation in stack ii) Pop operation in stack. | CO3 | 6 |
| c. | Evaluate the expression (3+4) x [10 x (2+6)+8] with the help of the stack. | CO3 | 10 |
|  | | | | | |
| 5. | a. | | Explain the set of instructions in the following categories of computer instructions with their pneumonic. |  |  |
|  | | i.Data transfer instructions | CO3 | 4 |
|  | | ii.Program control instructions | CO3 | 4 |
| b. | | Explain the following Data manipulation instructions |  |  |
|  | | i.Arithmetic instructions | CO3 | 4 |
|  | | ii.Logical and bit manipulation instructions | CO3 | 4 |
|  | | iii.Shift instruction | CO3 | 4 |
| (OR) | | | | | |
| 6. | | a. | Assume A = 1010 and B = 1101 |  |  |
|  | i.Show that adding B to the operation A+ +1 results in A . | CO2 | 8 |
|  | ii.Analyse if the carry bit is 1 and what can be done with the carry bit that results in the above addition | CO2 | 2 |
| b. | Show the step by step Booth’s algorithm for multiplication when the following numbers are multiplied  (+10) x (+5) | CO2 | 10 |
|  | |  |  |  |  |
| 7. | | a. | List four peripheral devices that produce an acceptable output for a person to understand | CO4 | 4 |
| b. | Discuss the need for ASCII Characters in input and output communication | CO4 | 4 |
| c. | Differentiate between isolated I/O and memory-mapped I/O. State the advantages and disadvantages of each | CO4 | 12 |
| (OR) | | | | | |
| 8. | | a. | State the three possible modes of data transfer. | CO6 | 2 |
| b. | Explain the Programmed I/O method with an example . | CO6 | 8 |
| c. | Discuss the need for interrupt initiated I/O and the software considerations that need to be followed to interface I/O devices to a computer system. | CO6 | 10 |
|  | | |  |  |  |
|  | | | **Compulsory** |  |  |
| 9. | | a. | Explain in detail about the prominent types semiconductor memory technology used in computer systems. | CO5 | 10 |
| b. | Discuss how paging is used in virtual memory. | CO5 | 10 |