Code No.: MCA 107 **L T C**
Paper: Computer Organization **3 1 4**

INSTRUCTIONS TO PAPER SETTERS:

1. Question No. 1 should be compulsory and cover the entire syllabus. There should be 10 questions of short answer type of 2 marks each, having at least 2 questions from each unit.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions to evaluate analytical/technical skills of candidate. However, student may be asked to attempt only 1 question from each unit. Each question should be 10 marks including subparts, if any.

OBJECTIVE: *The main objective of the syllabus is to make students understand the relevance Computer Organization in the software oriented course. It aims at introducing basic digital concepts and then use them to explain details of computer organization.*

PRE-REQUISITE:

- Basics of Digital Electronics
- Internal Components of the CPU

UNIT – I

Introduction and overview: Multiplexes, Demultiplexers, Decoders, Adders, Flip-flops : S-R, J-K, D, T, Master Slave and Edge triggered, Registers, shift registers, Bi-direction shift registers.
Register Transfer and Microoperation: Register transfer language, register transfer, bus and memory transfer, arithmetic microoperations, logic microoperations, shift microoperations.
[No. of Hrs: 12]

UNIT – II

Basic Computer Organization and Design: Instruction codes, computer registers, computer instructions, timing & control, instruction cycle, memory reference instructions, input-output and interrupts, design of basic computer, design of accumulator logic.
Microprogrammed Control Unit: Control memory, address sequencing.
Central Processing Unit: Introduction, general register organization, stack organization, instruction formats, addressing modes. **[No. of Hrs: 11]**

UNIT – III

Pipeline and Vector processing: Parallel Processing, pipelining, arithmetic pipeline, RISC Pipeline, Vector Processing, Array Processors.
Input-Output Organization: Peripheral devices, input-output interface, asynchronous data transfer, modes of data transfer, priority interrupt, direct memory access, input-output processor.
[No. of Hrs: 10]

UNIT – IV

Memory organization: Memory hierarchy, main memory, auxiliary memory, associative memory, cache memory, virtual memory, memory management hardware.
Multiprocessors: Characteristics of multiprocessor, Interconnection Structure, Interprocessor Communication & Synchronization. **[No. of Hrs: 09]**

TEXT BOOKS:

1. Mano M, "Computer System and Architecture", Pearson, 3rd Ed., 2009
2. Stallings W, "Computer Organization & Architecture", PHI, 8th Ed., 2010.

REFERENCES:

1. Malvino, "Digital Computer Electronics: An Introduction to Microcomputers", McGraw Hill, 1993.

2. Hayes, J. P. "Computer Architecture and Organization", McGraw Hill, 1998.
3. Andrew S. Tanenbaum, "Structured Computer Organization", PHI, 5th Ed., 2006.
4. P. V. S Rao, "Computer System Architecture", PHI, 5th Ed., 2009.
5. Anthony J. Dos Reis, "Assembly Language and Computer Architecture using C++ and Java", Cengage Learning, 2004.