

Code: CSCS1T3

I M.Tech-I Semester-Regular Examinations-February 2016

**COMPUTER ORGANIZATION AND ARCHITECTURE
(COMPUTER SCIENCE & ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

Answer any FIVE questions. All questions carry equal marks

- 1 a) What is the advantage of floating point representation? 4 M
- b) State and prove Demorgan's laws. 4 M
- c) Simplify the following and implement it using NAND gates. 6 M
- $$AB' + ABD + ABD' + A'C'D' + A'BD'$$
- 2 a) What is the difference between combinational and sequential circuits? 6 M
- b) Design a BCD counter using J-K Flip Flops. 8 M
- 3 a) Explain the operation of memory hierarchy in computer organization stating the importance of each level in the performance of computer. 4 M

- b) What is cache memory. Explain the following mapping procedures used in cache memory. 10 M
- i) Associative mapping
 - ii) Direct mapping
- 4 a) Compare and contrast isolated I/O and memory mapped I/O 4 M
- b) What is a priority interrupt. Explain the operation of parallel priority interrupt. 10 M
- 5 Explain the operation of addition and subtraction of numbers in signed magnitude representation, indicating how the overflow is detected. Draw the block diagram of the hardware required for the operation. 14 M
- 6 a) Explain the following addressing modes with examples 10 M
- i) Relative addressing
 - ii) Displacement addressing
 - iii) Stack addressing
 - iv) Base register addressing
- b) What are the advantages and disadvantages of using variable length instructions? 4 M

- 7 a) Briefly explain the two basic approaches used to minimize register memory operations on RISC machines. 7 M
- b) What is a delayed branch? Explain how the efficiency of the pipeline can be increased with delayed branch? 7 M
- 8 a) Explain in detail about symmetric multiprocessor organization and list the Potential Advantages of symmetric multiprocessor over a uni-processor. 10 M
- b) Briefly explain the desired characteristics of multiprocessor operating system. 4 M