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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT  
TEST-1 EXAMINATION- FEBRUARY -2020  
B.Tech VI Semester

COURSE CODE: 10B11CI613

MAX. MARKS: 15

COURSE NAME: Computer Organization & Architecture

COURSE CREDITS: 04

MAX. TIME: 1 HRS

*Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

[CO2+CO1] 1. Derive the mathematical expression for speed up that can be achieved using n processor system instead of a uniprocessor system. What is law of diminishing returns in multi core systems? How interrupts can improve the performance of computer system? Give suitable example to illustrate your answer.

[3+2]

[CO1] 2. Answer the following questions with suitable examples, diagram and mathematical formulas wherever required:

- Instruction set of a computer is a computer architectural issue or organizational issue? Justify your answer.
- Memory capacity of a computer is signified by data bus or address bus? Justify your answer.
- How frequency of the underlying processor signifies the speed of computer. Justify your answer.
- Scale out approach for processor design is better than scale up approach. Justify your answer.
- Computer architecture is logical or physical aspect of a computer? Justify your answer.

[1+1+1+1+1]

[CO2] 3. Let us assume that the processor is going to execute ADD B,A instruction of 16 bit which stores the sum of the contents of memory locations B and A into memory location A. Partial list of opcodes is 0001: Load AC from memory, 0010:Store AC to memory, 0101: Add to AC from memory. PC content is initialized to 300. Memory snapshot is shown as

Memory Locations	Instructions (Integer Format)
300	1 9 4 0
301	5 9 4 1
302	2 9 4 1
.....	.....
940	0 0 0 3
941	0 0 0 2

Show step by step execution of the above said instruction using IR, PC, AC and memory locations.

[5]