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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST-1 EXAMINATION- February -2019
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.*

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? What is the significance and relationship between word length of processor and word length of operating system as far as computer system speed is concerned? Give examples to illustrate your answer.

[3+2]

2. Justify the following statements with suitable examples, diagram and mathematical formulas wherever required:

a. Computer architecture is different from computer organization.

b. R-C delay decreases the performance of contemporary computers.

c. Data flow analysis increases the speed of processors while execution of programs.

d. Scale out approach for processor design is better than scale up approach.

e. Pipelined systems are faster than non pipelined systems.

[1+1+1+1+1]

3. (a) Computer A executes the MIPS ISA and has a 2.5 GHz clock frequency. Computer B executes the x86 and has a 3 GHz clock frequency. On average, programs execute 1.5 times as many MIPS instructions than x86 instructions.

For Program P1, Computer A has a CPI of 2 and Computer B has a CPI of 3. Which computer is faster for P1? What is the speedup?

[2.5]

(b) What are different methods for performance balance between processors and memory? Explain any two methods with examples.

[1+1.5]