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Final term Exam (Fall 2018)

Paper: CSE-304 Computer Organization and Architecture

Time: 2 Hours

Marks: 50

Note: Attempt all questions on answer sheet. Be precise and do your best!

Question No. 1 (Marks=10):

- i. What are the parts of an instruction? Briefly explain it with examples.
- ii. Implement the following equation using 0-Address format instructions (using mnemonics)?
 $16+20+24+28-32$

Question No. 2 (Marks=10)

- i. If the size of the program counter is 16 bits, what can be the maximum size of the memory in computer architecture provided the data width is 8 bits?
- ii. What flags represent in computer architecture? Explain at least four flags briefly with examples?
0, sign, parity, carry

Question No. 3 (Marks=10)

- i. How the carry bit act as an extension to the arithmetic and logic unit (ALU)? Explain briefly with examples?
- ii. What is the difference between displacement, relative, base-register and index addressing schemes? Explain briefly with examples?

Question No. 4 (Marks=10) (CLO-1; C2-Comprehension; PLO1-Engineering Knowledge)

You have to design an instructions set architecture (ISA), whose characteristics are;

- 16 different operations (ADD, SUB, OUT, HLT etc.)
- 12-bit address (program counter (PC), a memory address register (MAR) etc.)
- 16-bit data registers (accumulators, B, Temp etc.)
- 16-bit instruction register (IR)
- i. What will be the instruction size?
- ii. Opcode size?
- iii. Operand size?
- iv. A number of locations in memory?
- v. Memory data size?

Question No. 5 (Marks=10) (CLO-2; C2-Comprehension; PLO1-Engineering Knowledge)

- i. How scoreboard algorithm resolves the structural, data and control hazards? Explain it with the four cycles of the algorithm.
- ii. What is the difference between;
 - Read after write hazard
 - Write after write hazard
 - Write after read hazardExplain it with examples?