

## Exam # 1

### ICE 3003: Computer Architecture

(Fall 2012)

Q1. (30pts., but if you got every question right, +5pts.)

(A)  $P = \text{Capacitive load} \times V^2 \times F$ ,

$$P = \text{Constant} \times V^2 \times F,$$

$$P \propto V^2 \times F,$$

$$P \propto V^2, \text{ and } P \propto F$$

(B) Response time, Execution time / Throughput

(C) 8 registers

(D) if (rs<rt) rd=1; else rd=0;

(E) PC-relative

Q2. (10pts.)

1100 1100<sub>(2)</sub>, CC<sub>(16)</sub>

Q3. (30pts.)

(A) A=1.1, B=1.25

(B) B is 15/11 times faster than A

(C) New is 5/3 times (or 0.44s) faster than A and

New is 25/11 times (or 0.84s) faster than B

(D) P1=4GHz=4000MIPS=40억개/초 and P2=3GHz=3000MIPS=30억개/초

(E) 1.5배, P2 is 1.5 times faster than P1

(F) 6GHz

Q4. (30pts.)

(A) 2

(B)  $0 < X \leq 7FFFFFFF_{(16)}$

$$0 < X \leq 2^{31} - 1$$

$$5FBE4000_{(16)} < X \leq 7FFFFFFF_{(16)}$$

$$5FBE4001_{(16)} \leq X \leq 7FFFFFFF_{(16)}$$

$$010111111011111001000000000000_{(2)} < X \leq 01111111111111111111111111111111_{(2)}$$

$$0101111110111110010000000000001_{(2)} \leq X \leq 01111111111111111111111111111111_{(2)}$$

(C) No, No (10pts.),

Yes, No or No, Yes (5pts.)