

**Midterm Exam**

رقم التسجيل:

رقم التسلسل:

الاسم:

**Instructions:** Time **50** minutes. Open book and notes exam. No electronics. Please answer all problems in the space provided and limit your answer to the space provided. **No questions are allowed.**

<Good Luck>

**Q1.** For the three-port register file studied in the computer organization class, list two of each of the following:

<6 marks>

1) Services

**Read Register from Port 1, Read Register form Port 2, Write into a register**

2) Performance metrics

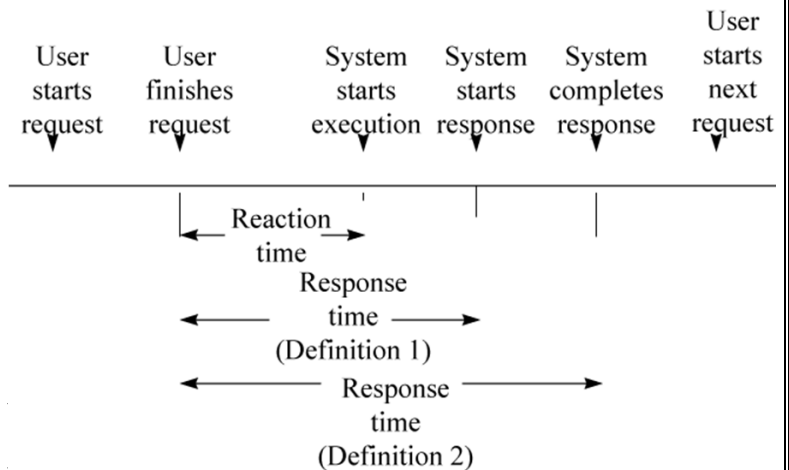
**Read time, Write time**

3) Workload parameters

**Port 1 register number, Port 2 register number, Write register number, register write signal**

**Q2.** Consider the following figure that illustrates definitions of the response time. What is the time you would use to estimate the system throughput of your employees when using a certain server?

<3 marks>



**The total time from one user request to the next user request.**

**Q3.** What is the best benchmark?

<3 marks>

**Your real workload**

**Q4.** How TPC-C price-performance ratio is measured?

<3 marks>

**The price is the total ownership cost over a period of time. The performance is the maximum number of transactions per minute that the system can serve without exceeding some target response time.**

**Q5.** Assume that you are interested in monitoring the number of disk reads and the aggregate disk read time of the C code shown below. Rewrite this code segment in the right box to collect the needed data.

<6 marks>

```
...
main () {
    int x, y;
    while(get_parameter(&x)) {
        y = read_disk(x);
        printf("%d\n", calc(y));
    }
}
```

```
main () {
    int x, y;
    while(get_parameter(&x)) {
        printf("Before read, x=%d,
            time=%f\n", x, current_time());
        y = read_disk(x);
        printf("After read, time=%f\n",
            current_time());
        printf("%d\n", calc(y));
    }
}
```

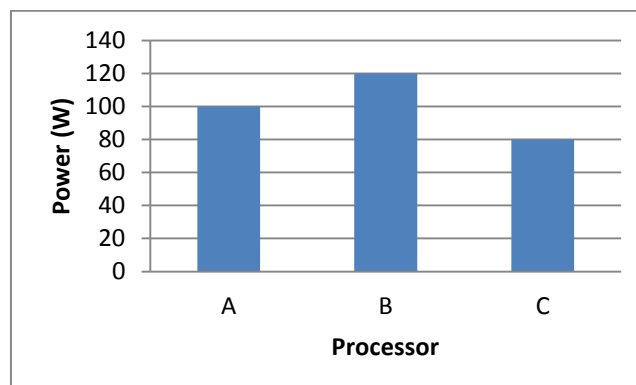
Or

```
main () {
    int x, y;
    int Reads = 0;
    float ts, Times = 0.0;
    while(get_parameter(&x)) {
        Reads++;
        t = current_time();
        y = read_disk(x);
        Times += (current_time - ts);
        printf("%d\n", calc(y));
    }
    printf("Reads = %d\n", Reads);
    printf("Total read time = %f\n",
        Times);
}
```

**Q6.** Present the following data graphically.

<3 marks>

	Processor A	Processor B	Processor C
Power (W)	100	120	80



**Q7.** If you are the maker of Computer A, what is the average value you are likely to report for the following benchmark results?

<6 marks>

	Benchmark I	Benchmark II	Average
Computer A	200 sec	100 sec	150 sec
Computer B	100 sec	150 sec	125 sec

**Since time is a lower-is-better metric, using A as a reference machine, gives best relative result for Computer A.**

	Benchmark I	Benchmark II	Average
Computer A	1	1	1.0
Computer B	0.5	1.5	1.0

**The average of the two systems is 1.0 and they appear equivalent, although the average of the raw data shows that Computer A takes longer time.**