

國立嘉義大學 99 學年度

資訊工程學系碩士班 (甲組) 招生考試試題

科目：計算機概論

- 一、What is the maximum number of entries that must be interrogated when applying the binary search to a list of 200 entries? What about a list of 100000 entries? (10%)
- 二、Express the following values in binary notation: (10%)
- (a) $4\frac{1}{2}$ (b) 2 (c) $1\frac{1}{8}$ (d) $5\frac{1}{16}$ (e) $5\frac{5}{8}$
- 三、What is the result of performing a one-bit left circular shift on the following bytes represented in hexadecimal notation? Give your answer in hexadecimal form. (10%)
- (a) AB (b) 5C (c) B7 (d) 35
- 四、Suppose that the hard disk on your personal computer rotates at 3000 revolutions a minute, that each track contains 16 sectors, and that each sector contains 1024 bytes. Approximately what communication rate is required between the disk drive and the disk controller if the controller is going to receive bits from the disk drive as they are read from the spinning disk? (10%)
- 五、Suppose a password consisted of a string of nine characters from the English alphabet (26 characters). If each possible password could be tested in a millisecond, how long would it take to test all possible passwords? (10%)
- 六、Describe how the CSMA/CD protocol controls the **deadlock** in a network based on the bus topology. (10%)
- 七、Suppose that we have designed a hash function that arbitrarily distributes records among 10 buckets in a database. The database is empty and we are going to insert a new record. If a new record is inserted to a non-empty bucket, it called a **collision**. Compute the probability that, all the first four records will be placed in empty buckets, that is, no collision will occur. (10%)
- 八、What sequence of numbers would be printed if the procedure named xxx as described below were executed with the value of N being 2? (10%)

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| <pre> procedure xxx (N) print the value of N; if (N < 3) then (apply procedure yyy to the value 4); print the value of N; </pre> | <pre> procedure yyy (N) print the value of N; apply the procedure xxx to the value 5; print the value of N; </pre> |
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- 九、The process of converting a program from one language to another is called translation. The translation process consists of three activities – **lexical analysis**, **parsing**, and **code generation**. Briefly describe the functions of the three activities. (10%)

- 十、Write a sequence of SQL instructions to answer the following questions about parts and their manufacturers in terms of the following database:

(a) Obtain a list of the parts made by Company X along with each part's cost. (5%)

(b) Which companies make a part with weight 1? (5%)

PART relation

| PartName | Weight |
|----------|--------|
| Bolt 2X | 1 |
| Bolt 2Z | 1.5 |
| Nut V5 | 0.5 |

MANUFACTURER relation

| CompanyName | PartName | Cost |
|-------------|----------|------|
| Company X | Bolt 2Z | 0.03 |
| Company X | Nut V5 | 0.01 |
| Company Y | Bolt 2X | 0.02 |
| Company Y | Nut V5 | 0.01 |
| Company Y | Bolt 2Z | 0.04 |
| Company Z | Nut V5 | 0.01 |