

國立臺北大學 103 學年度碩士班一般入學考試試題

系(所)組別：資訊管理研究所甲組

科 目：計算機概論

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可 不可使用計算機

一、 Multiple-choice questions — select one or more options. (45% , 3 points for each)

1. Which of the following statements is/are false?
 - a. Object-oriented programming is today's key programming methodology.
 - b. The Global Positioning System (GPS) uses a network of cellular communications towers to retrieve location-based information.
 - c. Software commands computer hardware to perform tasks.
 - d. In use today are more than a trillion general-purpose computers and trillions more cellphones, smartphones and other handheld devices.
2. Which of the following statements is/are false?
 - a. Moore's Law: Every year or two, the price of computers has approximately doubled.
 - b. Today's key programming methodology is object-oriented programming.
 - c. The vast majority of the microprocessors produced each year are used in general-purpose computers.
 - d. Computers process data under the control of sets of instructions called computer programs.
3. Which of the following statements is/are true?
 - a. The impressive functions performed by computers involve only the simplest manipulations of 1s and 2s.
 - b. ASCII is a popular subset of Unicode.
 - c. Fields are composed of characters or bytes.
 - d. On some operating systems, a file is viewed simply as a sequence of bytes.
4. Which of the following data items is/are arranged from the smallest to the largest in the data hierarchy?
 - a. records, characters, fields, bits, files.
 - b. bits, files, fields, records, characters.
 - c. fields, characters, bits, files, records.
 - d. bits, characters, fields, records, files.
5. Which of the following is/are not one of the six logical units of a computer?
 - a. Input unit.
 - b. Output unit.
 - c. Central processing unit.
 - d. Printer.
6. Which of the following statements is/are true?
 - a. A hash table uses a hash function to compute an index into an array of buckets or slots, from which the correct value can be found.
 - b. The main advantage of hash tables over other table data structures is storage.
 - c. Hash collisions -- different keys that are assigned by the hash function to the same bucket.
 - d. In a well-dimensioned hash table, the average cost (number of instructions) for each lookup is independent of the number of elements stored in the table.
7. Which of the following statements is/are true?
 - a. Big O specifically describes the worst-case scenario, and can be used to describe the execution time required or the space used (e.g. in memory or on disk) by an algorithm.
 - b. $O(1)$ describes an algorithm that will always execute in the same time (or space) regardless of the size of the input data set.
 - c. $O(N)$ describes an algorithm whose performance will grow linearly and in direct proportion to the size of the input data set.
 - d. Binary search is a technique used to search sorted data sets. This type of algorithm is described as $O(N)$.

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8. _____ models software in terms similar to those that people use to describe real-world objects.
- Object-oriented programming.
 - Object-oriented design.
 - Procedural programming.
 - None of the above.
9. Which of the following statements is/are false?
- SourceForge is one of a key organization in the open-source community.
 - iOS is an open source operating system.
 - The software that contains the core components of the operating system is called the kernel.
 - Linux source code is available to the public for examination and modification.
10. Which of the following statements is/are false?
- Classes are reusable software components.
 - A class is to an object as a blueprint is to a house.
 - A constructor can specify a return type.
 - A class is an instance of its object.
11. The linker links:
- The executable code with primary memory.
 - The object code with the external libraries.
 - The source code with the object code.
 - The primary memory with the CPU.
12. Today, virtually all new major operating systems are written in:
- Objective-C.
 - C or C++.
 - Visual C#.
 - Ada.
13. _____ helps Internet-based applications perform like desktop applications.
- RSS
 - Blogging
 - Ajax
 - Mashups
14. Which software product release category is "generally feature complete and supposedly bug free, and ready for use by the community?"
- Alpha.
 - Beta.
 - Release candidate.
 - Continuous beta.
15. What is the name of the values the method call passes to the method for the parameters?
- Objects.
 - References.
 - Arguments.
 - Values.

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二、 Multiple-choice questions -- select more options. (5%)

Which of the following statements are false?

- The compiler will implicitly create a default constructor if the class does not contain any data members.
- The compiler will implicitly create a default constructor if the programmer specifically requests that the compiler do so.
- The compiler will implicitly create a default constructor if the class does not define any constructors.
- When a client code programmer uses a class whose implementation is in a separate file from its interface, that implementation code is merged with the client's code during the compiling phase.
- The phases of systems development life-cycle (SDLC) in sequence is <Analysis, Planning, Design, Implementation, Training & transition, Operations & maintenance, Disposition>.
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- A multi-core processor implements several processors on a single integrated-circuit chip.
- Information in the memory unit is persistent—it is retained when the computer's power is turned off.

三、 Multiple choice questions: (10%)

- Which of the following service supports the most flexible configuration?
(A) SaaS (B) PaaS (C) IaaS (D) WaaS
- Which layer in the OSI (Open System Interconnection) reference model does HTTP belong to?
(A) layer 4 (B) layer 5 (C) layer 6 (D) layer 7.
- Which of the following description is true for relational database model?
(A) primary key is used to establish a relationship between two tables.
(B) foreign key is used to identify a row.
(C) a database is constructed by several tables.
(D) the SQL instruction SELECT-FROM-WHERE is used to add a new row to the database.
- Suppose A wants to send a message to B and the public key encryption scheme is used let B believe that the message is indeed sent by A. Which key(s) should be used to encrypt the message?
(A) A's public key (B) B's public key
(C) A's private key (D) A's public key and B's private key (E) B's public key and A's private key.
- Which of the following advantage is not belong to mobile computing?
(A) custom personal service (B) localization (C) portability (D) quality of connectivity

四、 What do the following term stand for? Give an application example for each term in our daily life. (12%)

- SoLoMo
- Big data
- NFC
- SaaS

五、 Please describe at least three differences between social networks, community, and blog. (8%)

六、 Please illustrate the differences between QR-Code, RFID, WiFi, and LTE from the viewpoints of the cost, transmission range, data storage, association time, access time, transmission rate and etc. (12%)

七、 Decompose the relation R(A, B, C, D, E, F, G, H, I, J, K, L, M, N) into 2NF, and then 3NF relations. The attributes {A, B, C} are the primary key. The attributes {M, N} forms a candidate key. The functional dependencies among the attributes of the relation are {A,B} → {G,I}; {M} → {F,H}; {J} → {K,L}; {H} → {D,E}. Please show the tables and the key of each table after the decompositions. (8%)