

國立彰化師範大學 97 學年度碩士班招生考試試題

系所：資訊管理學系碩士班

科目：計算機概論

☆☆請在答案紙上作答☆☆

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一. 單選題(70%)

1. () `int x=3; return x++ + 1;` In C, C++ or Java, what is the returned value? (a) 2 (b) 3 (c) 4 (d) 5 (e) none of the above.
2. () Which one of the followings is not one of the server-side programming languages? (a) PHP (b) ASP (c) JSP (d) VB (e) none of the above.
3. () Which one of the following statements about List is wrong? (a) it is an ordered collection (b) it can contain duplicate elements (c) its performance is better than Array if most of List elements are fixed. (d) it requires dynamic memory management. (e) none of the above.
4. () A mailbox is a message ____ that may be used by multiple senders and receivers. (a) array (b) list (c) stack (d) queue (e) none of the above.
5. () `int c = 8; c++; ++c; c %= 5;` In C, C++ or Java, what is the value of *c*? (a) 4 (b) 1 (c) 3 (d) 2 (e) none of the above.
6. () Which one of the followings is the collection of standards and specifications for web-based e-learning? (a) SCORM (b) Web 2.0 (c) XML (d) COM (e) none of the above.
7. () For realistic photo image preproduction, ____ format is the best choice. (a) vector (b) bitmap (c) jpeg (d) mpeg (e) none of the above.
8. () Which one of the following languages is used for representing 3D objects on the World Wide Web? (a) VRML (b) CSS (c) RSS (d) HTML (e) none of the above.
9. () If -124 is stored in an 8-bit memory and is represented as one's complement, its representation is _____. (a) 01111100 (b) 10000011 (c) overflow (d) underflow (e) none of the above.
10. () `int x = 5; int y = x++; if (y = 6) return 6 else return 5;` In Java, the returned value of the code fragment is (a) 4 (b) 5 (c) 6 (d) 7 (e) none of the above.
11. () Which one of the followings is true? (a) The order of the rows and columns is important to the Relational DBMS. (b) The optimistic approach to concurrency control requires either locking or time stamping techniques. (c) Relational models can achieve only data independence but not structural independence. (d) The scheduler establishes the order in which the operations within concurrent transactions are executed. (e) none of the above.
12. () The transaction ____ property requires that a transaction must be either entirely completed or aborted. (a) monotonicity (b) serializability (c) reliability (d) atomicity (e) none of the above.
13. () A ____ is a website combining text, images, and links to other media related to its topic. The ability for readers to leave comments in an interactive format is an important part of it. (a) RSS (b) video streaming site (c) homepage (d) blog (e) none of the above.
14. () There are two main parsers for XML file. Which one requires less memory? (a) DOM parser (b) SOAP parser (c) XSLT parser (d) SAX parser (e) none of the above.
15. () The IP address of `www.iwant.de` resides in _____. (a) USA (b) China (c) Taiwan (d) Japan (e) none of the above.
16. () ____ is a telecommunications technology aimed at providing wireless data over long distances in a variety of ways, from point-to-point links to full mobile cellular type access. (a) WiMAX (b) HiMAX (c) VDSL (d) ADSL (e) none of the above.
17. () The 8-bit ____ mask can be used to set the 5 leftmost bits of a 8-bit pattern. (a) 00000111 (b) 11111000 (c) 00011111 (d) 11100000 (e) none of the above.

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18. () _____ is a subject-oriented, integrated, time-variant, and non-volatile collection of data in support of management's decision-making process. (a) data mart (b) data cube (c) data warehouse (d) data dictionary (e) none of the above.
19. () The _____ manager has to guarantee the atomicity and durability properties of transactions in the presence of failure. (a) file (b) transaction (c) concurrency (d) recovery (e) none of the above.
20. () _____ is a protocol for mail service. (a) SMTP (b) FTP (c) HTTP (d) TELNET (e) none of the above.
21. () Which network topology needs cable termination? (a) bus (b) ring (c) star (d) all of the above (e) none of the above.
22. () Nowadays, many smart phones equip _____ which helps user navigate the area of interest with ease. (a) GPS receiver (b) wireless card (c) SIM card (d) 3G receiver (e) none of the above.
23. () _____ is a general term in wireless telecommunications that refers to the extending of connectivity service in a location that is different from the home location where the service was registered. (a) Roaming (b) Registering (c) ADSL (d) Agent (e) none of the above.
24. () The _____ defines a standardized packet format for delivering audio and video over the Internet. (a) RTP (b) TCP (c) UDP (d) PPP (e) none of the above.
25. () Most 3G telecommunication networks in Asia, Europe, Canada, and the USA use _____ technology. (a) W-CDMA (b) WiMAX (c) TDMA (d) DECT (e) none of the above.
26. () In the _____ I/O method, the CPU treats each register in the input/output controller as a word in memory. (a) isolated (b) memory-mapped (c) direct (d) indirect (e) none of the above.
27. () To create a digest of a document, you can use _____. (a) a prime number (b) a digital signature (c) DES (d) RSA (e) none of the above.
28. () Which one of the followings is not one of the three constructs of an algorithm? (a) decision (b) flowchart (c) sequence (d) repetition (e) none of the above.
29. () The worst Big O performance of Quicksort sorting algorithm is _____. (a) $O(N \cdot \log N)$ (b) $O(N)$ (c) $O(N^2)$ (d) $O(N^{3/2})$ (e) none of the above.
30. () When you create a reference to a link in a linked list, it (a) must refer to the first link. (b) must refer to the link pointed to by current. (c) must refer to the link pointed to by next. (d) can refer to any link you want. (e) none of the above.
31. () The average worst case search time of Binary tree is _____. (a) $O(1)$ (b) $O(N)$ (c) $O(N \cdot \log N)$ (d) $O(N^2)$ (e) none of the above.
32. () For a graph with N vertices, its minimum spanning tree has _____ edges. (a) $N-2$ (b) $N-1$ (c) N (d) $N+1$ (e) $N+2$
33. () The associative storage is based on the _____ property of an OS. (a) distributed (b) locality (c) centralized (d) performance (e) none of the above.
34. () _____-coupled multiprocessing involves connecting two or more independent computer systems, having their own operating system and storage, via communication link. (a) tightly (b) lightly (c) heavily (d) loosely (e) none of the above.
35. () The _____ is the UNIX systems' mechanism for interfacing between users and the system. (a) pipe (b) C language (c) vi editor (d) shell (e) none of the above.

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二. 解釋名詞，寫出英文全名或其定義(每題 2 分，共 10%)

1. Augmented reality

Definition:

2. Polymorphism (in object-oriented programming language)

Definition:

3. LED (in display technology)

Full-name: _____

4. XML (in web technology)

Full-name: _____

5. RPG (in computer game technology)

Full-name: _____

三. 簡答題(20%)

1. (5%) The following table contrasts the Java with C++. Put "X" on the blanks under the column-name of Java and C++ which you think the description is right.

	Java	C++
--	------	-----

1. It uses both interpreter and compiler technologies.
2. Its primitive data type size is unchanged across machines.
3. It is suitable for system-level programming.
4. Not every function in it is a virtual function.
5. It has a better GUI architecture.

2. (15%) One of the applications using the stack data structure is the calculator. In this scheme, the infix expression (e.g., $2+3*5$) is first converted to postfix (e.g., $235*+$), which is then evaluated using stack. Finish the following eval() function, capable of handling the basic +, -, *, / mathematic operators only, in Java which takes input arguments of the postfix string and a stack object.

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```
double eval(String postfix, Stack valStack) {
    char ch; // a character
    double right_operand, left_operand;

    for (int i = 0; i < postfix_ary.length; i++) {
        ch = postfix_ary[i].charAt(0); // see if it is a decimal or an operator.
        if (ch >= '0' && ch <= '9') { // a decimal
            valStack.push(postfix_ary[i]); // push into stack
        } else { // an operator
            right_operand = Double.parseDouble((String)valStack.pop());
            left_operand = Double.parseDouble((String)valStack.pop());

            // Start writing your codes here

        }
    }
    return Double.parseDouble((String)valStack.pop()); // return the calculated value.
}
```