參考用
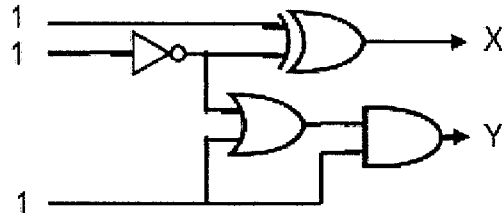
單選題 (1~15)，每題 3 分，不倒扣

1. Given a decimal number $(0.625)_{10}$, please calculate its corresponding **binary value**.
(A) 0.0111101 (B) 0.101　　　(C) 0.1101　　　(D) 0.0101　　　(E) None of the above.

2. Let X and Y be two **8-bit signed integers**, where X= 1111 0010, Y= 1001 1011
　　The result of X+Y should be
(A) 1100 0110　(B) 1100 0101　　　(C) 1000 1101　　　(D) 1000 1100　　　(E) None of the above

3. The values of X and Y on the right figure are
(A) X=1, Y=1　　(B) X=1, Y=0　　(C) X=0, Y=1
(D) X=0, Y=0　　(E) None of the above

4. An audio signal is sampled 10000 times per second, and each sample is represented by 65536 different levels. How many bits per second are needed to represent this signal?
(A) 6.5536　　　　　(B) 65536　　　(C) 75536　　　(D) 655360000　　　(E) None of the above.

5. X and Y are two real numbers in IEEE single-precision floating-point format:
　　　　　X= 0 00000010 01000000000000000000000,
　　　　　Y= 0 00000001 11000000000000000000000
　　Calculate and show the result of X+Y.
(A) 0 00000011 00000000000000000000000　(B) 0 00000100 00000000000000000000000
(C) 0 00000010 10000000000000000000000　(D) 0 00000011 10001000000000000000000
(E) None of the above

6. Which of the following **is true** about the VLIW (very long instruction word) architecture?
(A)　It is a bit-level-parallelism technology
(B)　It is a type of SIMD parallelism
(C)　It requires more compiler support than the RISC architecture
(D)　It uses several processes to execute multiple instructions at the same time
(E)　All of the above

7. Which of the following is **the I/O synchronization method** where the I/O device informs the CPU when it is ready for data transfer?
(A) programmed I/O　(B) interrupt-driven I/O　(C) DMA　(D) isolated I/O　(E) memory I/O

8. How many instructions can be **fetched simultaneously** in a uni-core processor with 4 stages of pipelining?
(A) 1　(B) 2　(C) 3　(D) 4　　(E) all of the above

9. Which of the following is true regarding **USB** (Universal Serial Bus)?
(A) Devices are hot-swappable in USB
(B) USB is a serial controller that connects both low and high speed devices
(C) When a packet is sent to one of the USB devices, all the USB devices receive the packet but only the target devices should accept the packet.
(D) All of the above
(E) None of the above

10. HTTP is a protocol defined in the _____ layer of the TCP/IP protocol suit?
(A) data link　(B) network　(C) transport　(D) application　(E) none of the above

11. What is the output of the recursive function on the right figure when called with an argument of 5?
(A) 3
(B) 5
(C) 7
(D) 8
(E) None of the above.

```
int rec( int i){
    if ( i < 8 ){
        return (rec(++i) + rec(++i));
    } else {
        return 1;
    }
}
```

12. Which of the following **is correct** regarding C++ programming?
(A) A friend function of a class can be declared as a member function of that class.
(B) We can create new operators while using operator overloading.
(C) We can overload Operator ?: in C++.
(D) You cannot initialize a *const* data member in the body of the constructor.
(E) all of the above.

13. Which of the following **is not correct** regarding C++ virtual functions?
(A) If a class contains one or more virtual functions, it is called an abstract class.
(B) Once declared virtual, a function remains virtual all the way down the hierarchy
(C) Classes used to instantiate objects are concrete classes.
(D) We can use the abstract base class to declare pointers and references.
(E) Attempting to instantiate an object of an abstract class causes a compilation error

14. Consider the C++ code piece on the right side. Which of the following **is correct** regarding the computing result?
(A) *p1 is 0 and *p2 is 1
(B) *p1 is 3 and *p2 is 1
(C) *p1 is unknown and *p2 is 3
(D) *p1 is 0 and *p2 is unknown
(E) None of the above

```
int *p1;
int *p2;
p1 = new int;    p2 = new int;
*p1 = 0; p2 = 0; p2 = p1;
*p2 = 1; *p1 = 3 ;p1 = 0;
```

15. Consider the C++ code piece on the right side. Which of the following **is correct** after executing the code piece?
(A) m[0][0] = 0　　(B) m[1][1] = 4
(C) m[2][0] = 4　　(D) m[2][1] = 8
(E) m[3][0] = 3

```
int m [4][4];
int i=0, j=0, k = 0;
for(i=0; i < 3; i++) m[i][j] = ++k;
for(j=0; j < 3; j++) m[i][j] = k++;
```
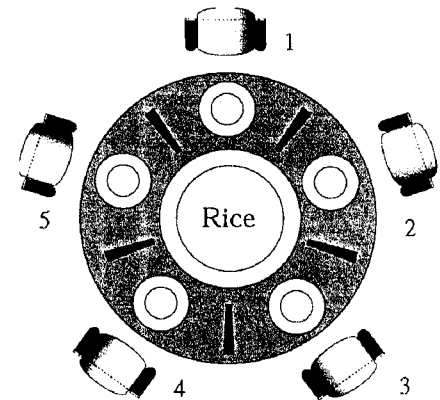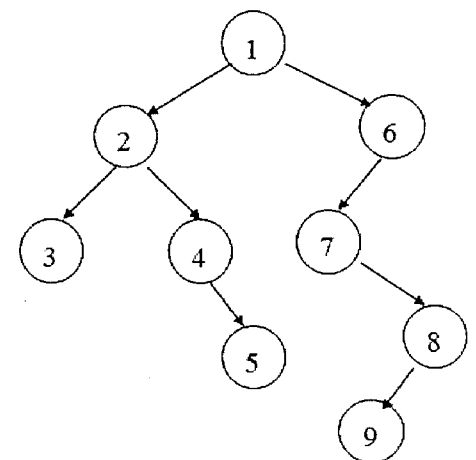
注意：背面有試題

16. A multi-programming OS uses paging. The available physical memory is 80MB, and each memory frame is 4MB. Three programs are loadded into the memory. Program X needs 17MB, Program Y needs 13MB, and Program Z needs 22MB.
(A) The number of unused frames is 7
(B) The wasted memory space caused by internal fragmentation is 8 MB
(C) Let the required memory space of the Program X grow from 17MB to 19MB. Then the first program should ask for one more memory frame.
(D) We can set a smaller memory frame szie (i.e. from 4MB to 2MB), to reduce the wasted memory space caused by external fragmentation.
(E) With demand paging, it is possible to load another program of 69MB into the memory when the three programs X, Y, Z, are in the memory.

17. Consider the 5-dining-philosophers problem, shown on the right figure. A philosopher can eat if he/she acquires his/her left and right chopsticks at the same time.
(A) The system can create a starvation situation.
(B) If every philosopher must pick his left chopstick first, then the system will not enter a deadlock state.
(C) If Philosopher 1 can always get his/her left and right chopsticks at any time, the system will not enter a deadlock state.
(D) If Philosopher 1 can always get his/her left and right chopsticks at any time, the system will not create a starvation situation.
(E) If the number of chopsticks doubles such that every philosopher has two chopsticks on his/her left side, the system will not enter a deadlock state.

18. Consider the figure on the right side.
(A) The order of the nodes using in-order traversal is 3 2 4 5 1 7 9 8 6.
(B) The order of the nodes using pre-order traversal is 1 2 6 3 4 7 5 8 9.
(C) The tree is a binary search tree.
(D) 5 and 8 are siblings.
(E) 5 is a leaf nodel while 8 is an internal node.

19. Choose the following items that **are correct** regarding computer security.
(A) RSA is a symmetric crytographic method
(B) Watermarking is one of the crytographic techniques.
(C) Denail of service (DoS) is a type of attack that threatens availability.
(D) Repudiation is a type of attack that threatens confidentiality.
(E) Steganography is the technique of concealing a message, image, or file within another message, image, or file.

20. Choose the following items that are correct regarding testing.
(A) Random testing is a type of white-box testing.
(B) Data flow testing is a type of white-box testing.
(C) Boundry testing is a type of white-box testing.
(D) Branch testing is a type of black-box testing.
(E) Control flow testing is a type of black-box testing.

注意：背面有試題

21. Which of the following C++ function declarations with default arguments **are correct**?
(A) void f(int length, int width, int height = 1);
(B) int f(int length=1, int width, int height);
(C) float f(int length, int width=1, int height = 1);
(D) double f(int length=1, int width=1, int height);
(E) char f(int length=1, int width=1, int height=1);

22. Which of the following items **are correct** in C++ and Java
(A) A reference is an alias for another variable in C++.
(B) C++ supports both pointers and references, while Java only supports references
(C) A reference to an integer is declared as " int* ref; " in C++.
(D) Assume refa and refb are two object references In Java. Then "refa = refb" has the effect of copying the object content of refb to the object content of refa.
(E) References cannot be null in C++

23. Which of the following statements **are correct** regarding Turing machine?
(A) A computing machine invented by John von Neumann
(B) A machine with the superscalar CPU architecture.
(C) A supercomputer owned by IBM in 1950s.
(D) A hypothetical device that manipulates symbols on a strip of tape according to a table of rules.
(E) A theoretic machine that solves the halting problem.

24. In C++ and Java, a derived class inherits all the members of the base class. Which of these remarks about inheritance **are true**?
(A) Inherited members are not initialized at the creation of a derived class object in C++ and Java.
(B) Inherited private members are not accessible to the derived class functions in C++
(C) Inherited protected members are not accessible to the derived class functions in C++
(D) Java only supports single inheritance
(E) C++ supports multiple inheritance.

25. Which of the following statements are correct regarding cloud computing?
(A) "Pay-as-you-go" is one of the main features of the private cloud.
(B) Google Gmail is a cloud software service.
(C) Amazon Elastic Compute Cloud (EC2) delivers cloud infrastructure as a service.
(D) Microsoft Windows Azure provides a cloud platform as a service.
(E) In private cloud environments, compute, network and storage resources must be managed across multiple domains.

26. Which of the following are correct regarding C++ templates?
(A) Function templates are used to perform identical operations on different types of data.
(B) A template cannot accept an integer parameter.
(C) Type parameters of a class template can have default arguments.
(D) Each class-template specialization has its own copy of each static data member.
(E) Each template parameter is preceded by keyword class or keyword typename.

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