

。採用電腦卡答題。

第 1 題 到 第 32 題 每題 3 分， 第 33 題 4 分

單選題

參考用

1. Which of the following bit patterns can represent "-20" using 8 bits in 2's complement format?  
 (a) 11101011 (b) 01101100 (c) 11101100 (d) 11101101 (e) none of the above

2. Given a binary number (101.11)<sub>2</sub>, please calculate its corresponding decimal value.  
 (a) 9.75 (b) 6.25 (c) 5.75 (d) 5.22 (e) None of the above.

3. Convert the decimal number 0.4 to its corresponding octal (八進位) value. Notice that all the following choices show four digits, which means you only need to calculate the solution for the first four digits.

- (a) 0.0500 (b) 0.2324..... (c) 0.3146.....  
 (d) 0.3450..... (e) 0.2314.....

4. What is the IEEE single precision floating point representation of (11.0101)<sub>2</sub>? (notice that Sign=1 bit, Exponent=8 bits in Excess\_127, and Mantissa=23 bits)

- (a) 1 10000000 10101000000000000000000  
 (b) 1 00000001 11010100000000000000000  
 (c) 0 00000001 10101000000000000000000  
 (d) 0 10000000 11010100000000000000000  
 (e) None of the above.

5. Assume that a computer use 2's complement to represent a negative integer. Let X and Y are two 8-bit signed integers in the computer, where

$$X = 1111\ 0010$$

$$Y = 0001\ 1011$$

Then  $X - Y = ?$

- (a) 1101 0111 (b) 1110 1011 (c) 1011 0111 (d) 0000 1101  
 (e) None of the above

6. X and Y are two real numbers in IEEE single-precision floating-point format:

$$X = 0\ 00000010\ 010000000000000000000000,$$

$$Y = 0\ 00000011\ 000111000000000000000000$$

Calculate and show the result of X+Y.

- (a) 0 00000100 110111100000000000000000  
 (b) 0 00000100 101111000000000000000000  
 (c) 0 00000011 101111000000000000000000  
 (d) 0 00000101 010111000000000000000000  
 (e) None of the above

7. A computer has 2048 MB (1MB=1024KB, 1KB=1024Bytes, 1Byte=8Bits) of memory, and each word (the smallest unit for memory access) is 4 bytes. Then at least \_\_\_ bits are required to address every single word in memory.

- (a) 19 (b) 25 (c) 28 (d) 29 (e) None of the above

8. Let's consider an 8-bit hexadecimal integer  $X = (B2)_{hex}$

Then  $X XOR (FF)_{hex} XOR (0)_{hex} XOR (FF)_{hex} = ?$

- (a) (4D)<sub>hex</sub> (b) (42)<sub>hex</sub> (c) (FF)<sub>hex</sub> (d) (0)<sub>hex</sub> (e) (B2)<sub>hex</sub>

9. Which of the following is true about computer architectures?

- (a) CISC stands for complete instruction set computer, which has a large set of instructions.  
 (b) RISC stands for recursive instruction set computer.  
 (c) SIMD stands for single instruction-stream, multiple data-streams.  
 (d) Pipelining is a method to initiate data transfer between the CPU and an I/O device.  
 (e) SCSI is an computer architecture in which several instructions belonging to several instructions streams simultaneously operate on several data streams.

注意：背面有試題

參考用

10. What of the following I/O mechanisms uses busy waiting?  
(a) Programmed I/O (b) interrupt I/O (c) DMA (d) divided I/O (e) encoded I/O
11. What of the following is a standard stage of a machine cycle?  
(a) fetch (b) decode (c) execute (d) all of the above (e) none of the above
12. Which of the following software is responsible to assemble all necessary parts of object code from system library and programmers' sources?  
(a) linker (b) loader (c) preprocessor (d) assembler (e) profiler
13. When a program is being executed, part of the program is in memory and part is on disk (usually demand paging or demand segmentation mechanism is applied). Both part of memory is managed by OS and work together as an entity, this is called:  
(a) virtual memory (b) cache memory (c) merged memory (d) memory hierarchy (e) registers
14. which of the following memory is usually the fastest in a computer system?  
(a) ROM (b) tapes (c) RAM (d) registers (e) RAID
15. Which of the following **is not correct**?  
(a) A CD-RW can be written many times.  
(b) SRAM uses traditional flip-flop gates..  
(c) There is no addressing mechanism to access each block in a magnetic tape.  
(d) DRAM memory cells need to be refreshed periodically.  
(e) SRAM is read-only memory.
16. The idea of a universal computational device was first described in around 1937 by  
(a) Alan Turing. (b) John von Neumann. (c) Paul McCartney.  
(d) Albert Einstein. (e) Alonzo Church.
17. Which of the following languages is an example of declarative programming language ?  
(a) COBOL (b) Pascal (c) Fortran (d) Prolog (e) C++
18. Which of the following is logical extension in which CPU switches jobs so frequently that users can interact with each job while it is running, creating interactive computing?  
(a) Caching. (b) Kernel mode. (c) Clustering (d) Rendering  
(e) Timesharing
19. A network uses a star topology. Then it must belong to:  
(a) the TCP/IP connection (b) the point-to-point connection  
(c) the multipoint connection (d) the SMTP connection  
(e) None of the above
20. Which of the following is a MAC (media access control) address?  
(a) 00-1B-FC-58-0A-35 (b) http://www.csie.ncu.edu.tw  
(c) 140.115.52.108 (d) Jimmie.Foxx@gmail.com  
(e) None of the above
21. To implement a polymorphism, what kind of member function is needed to be designed in the base class for dynamic binding to take effect?  
(a) utility function (b) boolean function (c) default constructor  
(d)access function (e) virtual function
22. What of the following is not a container from C++ STL library?  
(a) vector (b) list (c) string (d) multi-map (e) deque

注意:背面有試題

參考用

23. What kinds of constructor will be invoked when an object served as a "pass by value" parameter?

- (a) default constructor (b) conversion constructor (c) virtual constructor  
(d) copy constructor. (e) derived constructor

24. What principal or direction is usually the underlying reason when we declare "const" variables or pointers in C language?

- (a) least privilege (b) fast software development (c) concept generalization  
(d) better performance. (e) programmability

25. Consider the piece of code on the right side. Assume "Pass-by-value" is used for function calls. What will be printed on the standard output?

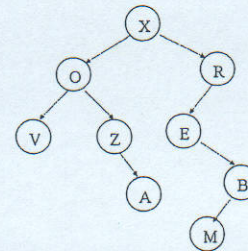
- (a) a is 1 and b is 1  
(b) a is 2 and b is 1  
(c) a is 2 and b is 2  
(d) a is 1 and b is 2  
(e) None of the above

```
void swap (int x, int y) {
    int t = y; x = y; y = t;
}

int main(void)
{
    int a = 1; int b = 2;
    swap( a, b );
    printf("a is %d and b is %d\n", a, b);
}
```

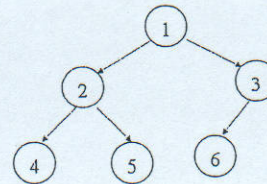
26. Consider the figure on the right side. Which of the following **is true** using the tree terminology?

- (a) Z and E are siblings.  
(b) Both R and O are ancestors of A.  
(c) The tree is not a binary tree.  
(d) Z is a leaf node.  
(e) None of the above.



27. Given the following figure, which of the following choices is a correct in-order traversal?

- (a) 4 2 5 1 6 3  
(b) 4 5 2 6 3 1  
(c) 1 2 4 5 3 6  
(d) 2 4 5 1 6 3  
(e) None of the above



28. What is a Turing test?

- (a) A test to compare the complexity of algorithms  
(b) A test to determine whether or not a computer has intelligence.  
(c) A technique to prove that the halting problem is unsolvable.  
(d) A theoretic machine to execute parallel algorithms.  
(e) An algorithm to test if a computer is secure or not.

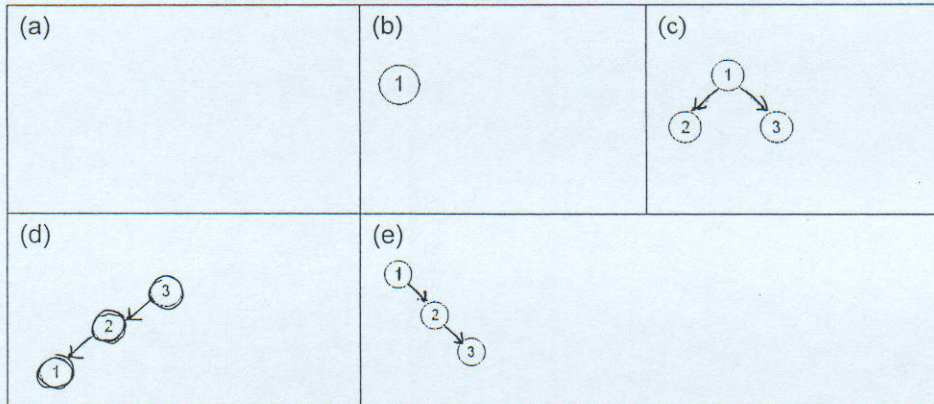
29. Which of the following **is valid**?

- (a)  $\{X \vee Y, X\} \vdash Y$ .  
(b)  $\{X \wedge Y, X \rightarrow Z\} \vdash Z$   
(c)  $\{X \rightarrow Y, Y\} \vdash X$ .  
(d)  $\{X \rightarrow Y, Y \rightarrow Z\} \vdash Z \rightarrow X$   
(e)  $\{X \vee Y, Y \wedge Z\} \vdash X$

注意: 背面有試題

參考用

30. Which of the following is **not** a binary search tree?



31. Consider the C++ code on the right side. What value will be printed on the screen after execution of the above code?

- (a) 0                      (b) 1                      (c) 2                      (d) 3  
(e) None of the above

```
int x=2, y=1, z=0;

if ((x=y) == 3)
    if ((x=z) == 3)
        z=1;
    else
        z=2;

std::cout << z << std::endl;
```

32. Consider the C++ code on the right side. Assume that the size of an int variable is 8 and the size of a pointer is 4. What value will be printed on the screen after the program finishes?

- (a) 4                      (b) 8  
(c) 20                      (d) 40  
(e) None of the above

```
int main() {
    int a[5];
    int *b=a;
    std::cout << sizeof(b) << std::endl;
    return 0;
}
```

33. Consider the C++ code on the right side. What value will be printed on the screen after main() finishes?

- (a) 2    (b) 1    (c) 0  
(d) a value which is greater than 2.  
(e) None of the above

```
int x =2;

int main() {
    int x=1,y=0;
    for (int x=0; x<2 ;x++) {
        int y=x+1 ;
    }
    std::cout << y << std::endl;
    return 0;
}
```