

國立高雄大學九十四學年度轉學招生考試試題

系所組別：資訊工程學系

科目：計算機概論

考試時間：90 分鐘

本科原始成績滿分 100 分

單選題：(30 分)

1. Which of the following uses presence or absence of an electrical charge as on or off states? (a) Fiber optic (b) DVD (c) Disk (d) RAM
2. Which of the following is of the slowest data transfer rate? (a) USB (b) SCSI (c) RS 232 (d) 1394
3. Which of the following is volatile? (a) Cache memory (b) PROM (c) Mini USB drive (d) Zip disk
4. The capacity of a data communications channel is measured by: (a) MB (b) Bytes per second (c) Bits per second (d) Mhz
5. The Bluetooth range is: (a) 30 feet (b) 3000 feet (c) 3 miles (d) 30 miles
6. The first operational electronic computer is: (a) ENIAC (b) UNIVAC I (c) IBM 650 (d) IBM 360
7. Which of the following is the fastest in accessing data by CPU? (a) Register (b) Cache memory (c) DRAM (d) Hard disk
8. Which of the following is of sequential data access? (a) Hard disk (b) Magnetic tape (c) DRAM (d) DVD
9. Which of the following is not an input device? (a) OCR scanner (b) Light pen (c) Keyboard (d) Plotter
10. The device to convert digital signal to analog signal and vice versa is: (a) Modem (b) Bus (c) Cache memory (d) Decoder
11. Which of these is not a component of a typical PC? (a) Printer (b) Hard disk (c) Wand scanner (d) Keyboard
12. The operating system for Apple iMac is: (a) Linux (b) Mac OS X (c) DOS (d) Windows 2000
13. Web pages can be tied together by: (a) Cybertext links (b) Hydratext links (c) Hydrolinks (d) Hyperlinks
14. Which of these would not be associated with a wireless local area network: (a) Access points (b) Wi-Fi (c) IEEE 802.11b (d) DSL
15. Internet-based capabilities that help you find information on the Internet are: (a) Seek ports (b) Search engines (c) Search motors (d) Find files

簡答題：(30 分)

16. What is the maximum data transfer rate of a 40X CD-ROM?
17. Convert decimal -25 to 8-bit 2's complement.
18. Convert 8-bit 2's complement integer C3h to decimal.
19. What is cache memory?
20. If an IP address is 140.127.1.1, which class (A, B, C, D, or E) is this IP address and why?

21. What is DNS?
22. What is a proxy server?
23. What is VoIP?
24. What is BIOS?
25. What is CSMA/CD protocol?

C 程式語言:

26. The following program asks the user to enter two integers, and compares these two integers. Find and correct the errors in the program. (10 分)

```
#include <stdio.h>

int main()
{
    printf("Enter the first number: "); /* prompt user */
    scanf("%d", value1); /* read values from keyboard */
    printf("Enter the second number: "); /* prompt user */
    scanf("%d", value2); /* read values from keyboard */

    if (value1 > value2)
        printf("%d is larger.\n", value1);
    if (value1 < value2)
        printf("%d is larger.\n", value2);
    if (value1 = value2)
        printf("These two numbers are equal.\n");

    return 0; /* indicate successful termination */

} /* end main */
```

27. Write a program that reads a number of seconds, and prints the equivalent numbers of hours, minutes, and seconds as shown in the following figure. (10 分)

```
Enter a number of seconds: 10000
10000 seconds are equal to 2 hours, 46 minutes, and 40 seconds
Press any key to continue_
```

28. What does the function oddEven perform? What is the execution result on the screen? (10 分)

```
#include <stdio.h>
void oddEven(int a[], int size);

int main()
{
    int a[10] = {1, 4, 6, 2, 3, 5, 6, 4, 3, 2};

    oddEven(a, 10);
    printf("\n");

    return 0;
}
```

```

void oddEven(int a[], int size)
{
    if (size == 1)
        printf("%d, ", a[0]);
    else {
        if (a[size-1]%2 == 1) {
            printf("%d, ", a[size-1]);
            oddEven(a, size-1);
        }
        else {
            oddEven(a, size-1);
            printf("%d, ", a[size-1]);
        }
    }
}

```

29. The following program sorts a 5-element array. What is the execution result on the screen? (10 分)

```

#include <stdio.h>

int bubbleSort(int a[], int size);

int main()
{
    int a[5] = {5, 3, 2, 1, 4};

    printf("num = %d\n", bubbleSort(a, 5));

    return 0;
}

int bubbleSort(int a[], int size)
{
    int i, j, k, hold, num;
    num = 0;
    for (i=1; i < size; i++) {
        for (j=0; j < size-1; j++) {
            if (a[j] > a[j+1]) {
                hold = a[j];
                a[j] = a[j+1];
                a[j+1] = hold;
                num++;
            }
        }
        printf("After pass %d, a[] = ", i);
        for (k=0; k < size; k++)
            printf("%d, ", a[k]);
        printf("\n");
    }
    return num;
}

```

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You need to show all your work.

1. (10 pts) Show that  $f(x) = \int_1^{2x} \sqrt{16+t^4} dt$  has an inverse and find  $(f^{-1})'(0)$ .

2. Find the limit.

(a) (10 pts)  $\lim_{x \rightarrow 0} \left( \frac{\sin x}{x} \right)^{1/x^2}$

(b) (10 pts)  $\lim_{(x,y) \rightarrow (0,0)} \frac{x^9 y}{(x^6 + y^2)^2}$

3. (15 pts) A rectangle is inscribed in a circle of radius 5 inches. If the length of the rectangle is decreasing at the rate of 2 inches per second, how fast is the area changing at the instant when the length is 6 inches?

4. Find or evaluate the integral.

(a) (10 pts)  $\int \frac{1}{5+3\sin x} dx$

(b) (10 pts)  $\int_0^1 x \ln x dx$

(c) (10 pts)  $\int_0^1 \int_0^{\cos^{-1} y} e^{\sin x} dx dy$

5. (15 pts) Find the area of the surface generated by revolving  $y = \cos x$ ,  $x \in [0, \frac{\pi}{2}]$  about the  $x$ -axis.

6. (10 pts) Find the values of  $p$  for which the series  $\sum_{n=2}^{\infty} \frac{\ln n}{n^p}$  converges.