

國立臺北科技大學

九十五學年度電資碩士在職專班招生考試

乙組：系統概論(含計算機概論、電子學)試題

填准考證號碼

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注意事項：

1. 本試題共【七】題，配分共 100 分。
2. 請按順序標明題號作答，不必抄題。
3. 全部答案均須答在答案卷之答案欄內，否則不予計分。

一、Answer the following multiple choice questions. (15%)

1. _____ is a code used by the Java language to represent characters.
 - a. Unicode
 - b. EBCDIC
 - c. ASCII
 - d. Extended ASCII
2. In the _____ graph method of representing an image in a computer, the image is decomposed into a combination of curves and lines.
 - a. vector
 - b. quantized
 - c. bitmap
 - d. all of the above
3. The _____ method of integer representation is the most common method to store integers in computer memory.
 - a. unsigned integer
 - b. sign-and-magnitude
 - c. 1's complement
 - d. 2's complement
4. In 2's complement representation with a 5-bit allocation, you get _____ when you add 10 to 10.
 - a. -11
 - b. -12
 - c. -13
 - d. none of the above
5. The _____ controller features a parallel interface and daisy-chained connection for I/O devices.
 - a. USB
 - b. SCSI
 - c. IDE
 - d. FireWire

6. _____ is a memory type with capacitors that need to be refreshed periodically.
- a. SRAM
 - b. PROM
 - c. DRAM
 - d. EPROM
7. In the _____ method to synchronize the operation of the CPU with an I/O device, a large block of data can be passed from the I/O device to memory directly.
- a. DMA
 - b. isolated I/O
 - c. interrupt-driven I/O
 - d. all of the above
8. The _____ layer of the OSI model compresses and decompresses data.
- a. data-link
 - b. network
 - c. transport
 - d. presentation
9. The _____ layer of the OSI model is responsible for source-to-destination delivery of an individual packet.
- a. data-link
 - b. network
 - c. transport
 - d. presentation
10. An Internet address in IPv4 consists of _____ bits; whereas the address in IPv6 consists of _____ bits.
- a. 32; 128
 - b. 32; 192
 - c. 48; 128
 - d. 48; 192
11. _____ can occur if a process holds too many resource restrictions in a computer.
- a. Starvation
 - b. Deadlock
 - c. Paging
 - d. Partitioning
12. Use a _____ search for an ordered list; whereas use a _____ search for an unordered list.
- a. binary; bubble
 - b. random; sequential
 - c. random; binary
 - d. binary; sequential
13. Of the various database models, the _____ model is the most prevalent today.
- a. network
 - b. hierarchical
 - c. relational
 - d. queue
14. A string of two hundred 0s is replaced by two markers, a 0 and the number 200. This is _____.
- a. Morse coding
 - b. Lempel Ziv encoding
 - c. run-length encoding
 - d. none of the above
15. _____ is a lossy compression method for pictures and graphics; whereas _____ is a lossy compression method for video.
- a. MPEG; JPEG
 - b. MPEG; DCT
 - c. JPEG; DCT
 - d. JPEC; MPEG

二、According to the following C program segments, present their execution results. (20%)

1. void main()

```

{ int n=10, k;
  int digit=0;
  for( k=1; k<=n; k++ )
  { digit=Fib(k)%10;
    printf("PW_%d = %d\n", k, digit);
  }
}

int Fib(int n)
{ if( n==1 || n==2 )
  return(1);
  else
  return(Fib(n-1)+ Fib(n-2));
}

```

2. void main()

```

{ char code[ ]="PAPLEcpu";
  int len=8, idx, j;
  for( idx=len-1; idx >1; idx-- )
  { Decode(code, idx);
    printf("\n Pass_%d : ", idx);
    for( j=0; j<len; j++ )
      printf("%c", code[j]);
  }
}

void Decode(char code[ ], int i)
{ char temp='V';
  temp=code[i];
  code[i]=code[i-1]; code[i-1]=code[i-2];
  code[i-2]= temp;
}

```

三、Consider the six processes, $P_1, P_2, P_3, P_4, P_5,$ and P_6 , arrived at different time, as listed below. Determine the order of processes to be finished, and compute the average waiting time, based on the following non-preemptive CPU scheduling algorithms: (a) First-Come, First-Served, (b) Shortest-Job-First, and (c) Priority, respectively. (15%)

Process	Burst Time (ms)	Arrival Time	Priority
P_1	20	6	1
P_2	10	12	3
P_3	30	14	5 (highest)
P_4	15	0	3
P_5	5	22	2
P_6	25	26	4

四、Extending the basic CMOS inverter circuit, design a CMOS gate circuit to implement the function $Y = \overline{C} + \overline{A} \cdot \overline{B}$. Indicate the inputs ($A, B,$ and C) and output (Y) on the circuit. (15%)

五、Find out the logic function, $Y = f(A, B, C, \bar{C})$, implemented by the following circuit, as shown in Fig. 1. (10%)

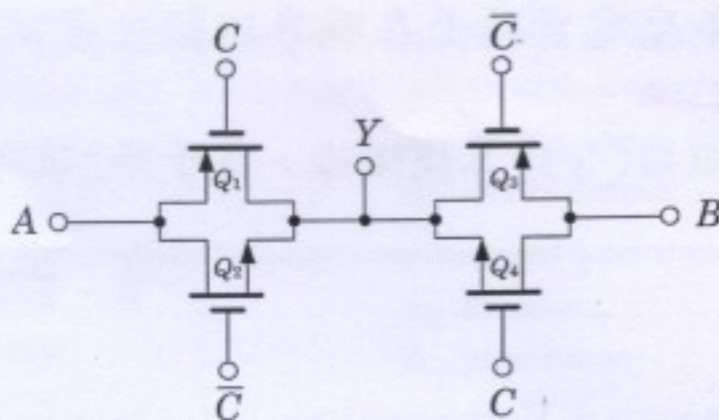


Fig. 1.

六、Assuming the following op amplifier to be idea, derive an expression for the closed-loop gain, $G_1 = v_o/v_i$, in terms of R_1 and R_2 , as shown in Fig. 2. (15%)

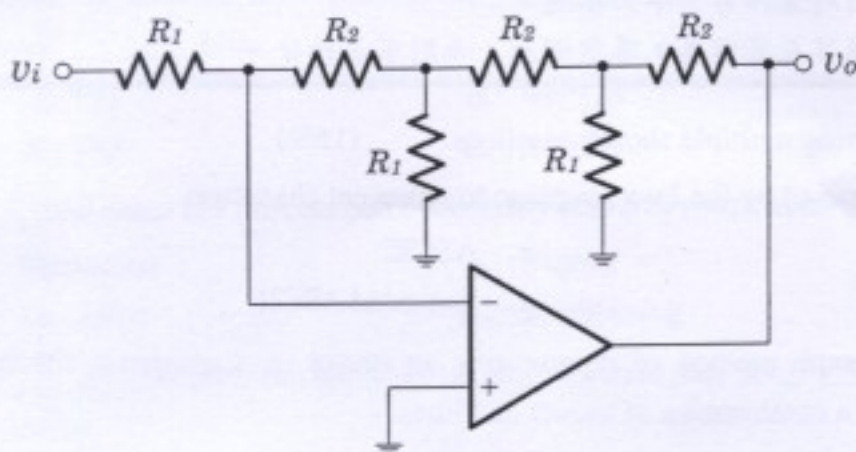


Fig. 2.

七、The closed-loop gain, $G_x = v_o/v_i$, is adjustable by setting x on the potentiometer ($R = 10K\Omega$), as shown in Fig. 3. Determine the value of x such that G_x equals G_1 when $R_2 = 2R_1$ in the above circuit (Fig. 2). (10%)

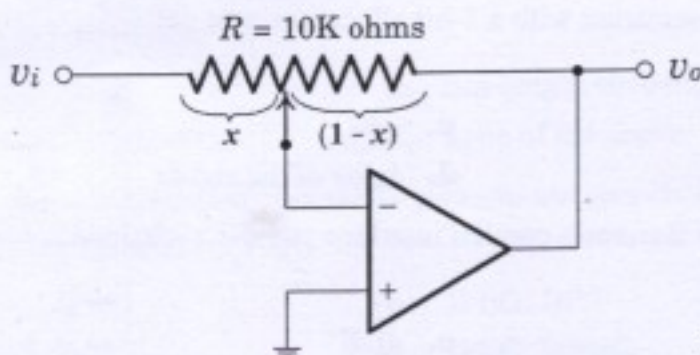


Fig. 3.