1. (15%) Given a C program as follows:

   1) # include <stdio.h>
   2) int calculate (int n);
   3) int x = 3;
   4)
   5) int main( ) {
   6)   int n = 5;
   7)   int a = calculate(n);
   8)   printf ("main: n =%d, a = %d, x = %d \n", n, a, x);
   9)   return 0; }
   10)
   11) int calculate (int n) {
   12)   n = x*n;
   13)   x++;
   14)   printf ("calculate: n = %d, x = %d \n", n, x);
   15)   return n; }

   In line 8, what will be printed on screen, "main: n =____ , a =____ , x =____"? likewise, in line 14, what will be printed on screen "calculate: n =____, x =____" ?

2. (5%) Given a Java program as follows,

```java
class ContinueDemo {
    public static void main(String[] args) {
        String searchMe = " A peck of pickled peppers Peter Piper picked ";
        int max = searchMe.length();
        int numCs = 0;
        for ( int i = 0; i < max; i++) {
            if ( searchMe.charAt(i) != 'c')
                continue;
            numCs++; }
        System.out.println("Found " + numCs + " c in the string.");
    }
}
```

   What will be printed on screen?

3. (5%) Given a C++ program,

```cpp
class CreateDestroy {
    public:
    CreateDestroy() { cout << "constructor called, "; }
    ~CreateDestroy() { cout << "destructor called, "; } };

int main() {
    CreateDestroy c1;
    CreateDestroy c2;
    return 0; }
```

   What will be printed on screen?
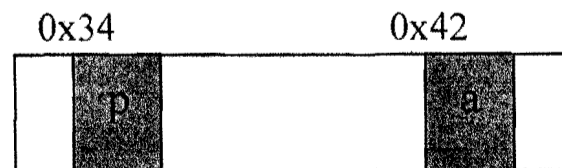
4. (15%) Please answer the following,

    (a) The decimal value of $0xF4_{(16)}$

    (b) The decimal value of $11011011_{(2)}$

    (c) The binary value of $79_{(10)}$

    (d) The hexadecimal value of $138_{(10)}$

    (e) The hexadecimal value of $10101011_{(2)}$

5. (10%) What are the three main features in object-oriented programming?

6. (20%) According to the following code segment and the figure of memory location, please fill the following blanks,

```c
int main (void)
{
    int *p;
    int a ;
    a = 10 ;
    p = &a ;
}
```

physical
memory
address

0x34   0x42

       p   a

    (a) *p = _____

    (b) p = _____

    (c) &p = _____

    (d) a = _____

    (e) &a = _____

7. (30%) Write a function $sum(1, n) = 1+2+3+...+(n-1)+n$ using
   (a) Iteration using "for" loop (10%)
   (b) Iteration using "while" loop (10%)
   (c) Recursion (用遞迴才給分) (10%)