Sample Midterm

1. What are all possible outputs of the following code fragment?

```
void f(int a, int b)
{
      printf("%d %d\n", a, b);
}

void main(void)
{
      int i = 5;
      f(++i, ++i);
}
```

2. Given the definitions

```
int numbs[10];
int *ptr = numbs;
```

   which of the following are equivalent, and why?

   a. numbs[3]
   b. numbs + 3
   c. * (numbs + 3)
   d. * (ptr + 3)
   e. *ptr + 3

3. Write a recursive function to add the integers from a to b. You may assume that a ≤ b initially.
4. Use the following code fragment to answer parts a, b, and c:

```
for(x = i = 0; i <= 100; i += 2, x += i);
```

   a. In one short sentence , what does this for loop do?
   b. Is the following while loop equivalent? If not, how does its result differ?

```
x = i = 0;
while( i++ = 100)
      x += ++i;
```

   c. Does the following for loop do the same thing? If not, what does it do?

```
for(x = i = 0; i <= 100; i++){
      if (!(i % 2))
            continue;
      x = x + i;
}
```

5. What does the following function do?

```
int x(char *s, char *t)
{
      for( ; *s == *t; s++, t++)
            if (*s == '\0')
                  return(0);
      return(*s - *t);
}
```

6. What does this function do?

```
char *x(char *s, char c)
{
      char *r = NULL;

      do{
```

```
            while(*s && *s != c) s++;
            if (*s) r = s;
      } while(*s++);
      return(r);
}
```

7. The following segment of code is supposed to print the number of times the routine a_again is called. Yet, regardless of the input, it prints 0. Why? How would you fix it?

```
void a_again(int acount)
{
      ++acount;
}

void main(void)
[
      register int c;
      int counter = 0;

      while((c = getchar()) != EOF)
            if (c == 'a' || c == 'A')
                  a_again(counter);

      printf("%d\n", counter);
      exit(0);
}
```