

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 $a \leq b$ 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 account)
{
    ++account;
}

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);
}
```