

Sample Midterm

These are sample questions that are very similar to the ones I will ask on the midterm.

1. Which of the following is *not* a valid C variable name?
 - (a) hello
 - (b) chomp_burp
 - (c) whilex
 - (d) more-more-more
 - (e) TrUcKiNg
2. Evaluate the following expressions, assuming $a = 1$, $b = -3$, and $c = 0$. Treat them independently, so (for example) after evaluating (b), use the above values for (c).
 - (a) $a + b < c$
 - (b) $c == !a == c$
 - (c) $a = ++b$; give the values of both a and b as well
 - (d) $a-- == !b$; give the value of a as well
 - (e) a / b
3. True or False: If $x = -1$, then `if (x) printf("1"); else printf("2");` prints 2.
4. Write a recursive function to add the integers from a to b . Please assume that $a \leq b$.
5. 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++);
}
```

6. 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`
7. 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? (*Hint*: look at the values of both x and i .)


```
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;
    }
```

8. 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);
}
```

9. 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;
}

int main(void)
{
    int c;
    int counter = 0;

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

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