Midterm One

Please fill your name and answers in the provided scantron answer sheet.

`??` is an integer value that can be anything, including `0`, but not necessarily `0`, and it is not the same value everywhere. It can have `2` different values in the same question.

You can assume that `#include <stdio.h>` is used for all programs.

"Compilation Error" means that there is no compilation command that would allow it to compile successfully (you can assume the use of `-std=c99` flag).

1 - a
2 - a
3 - b
4 - a
5 - a
6 - c
7 - d
8 - b
9 - b
10 - a
11 - b
12 - a
13 - b
14 - c

1

What does the following program fragment print?

```
char h[] = "Hello";
int x = h[5];
printf("%d", x);
```

(a) `0` (b) `\0` (c) `111` (d) `??` (e) `Segmentation Fault`

2

Which of the following code fragments correctly sets the variable `len` to the length of the null-terminated string `str`?

(a) `for (len = 0; str[len] != '\0'; len++) {}`

(b) `for (len = 0; ; ++len) { if (*(str+len) == EOF) break; }`

(c) `len = 0; while (str != NULL) { str++; len++; }`

(d) `len = str['\0'];`

3

What does the following program fragment print?

```
int a = 5; printf("%d", (3 &a) || 2);
```

(a) `0` (b) `1` (c) `3` (d) `5`

4

What does the following program print?

```
int fun4(int* x){ int z = *x; return z++; }
int main(){
  int x = 0, z = fun4(&x);  printf("%d", x);
}
```

(a) `0` (b) `1` (c) `4` (d) `5`

5

What does the following program print?

```
int foo(int a, int b) { return a = a + b; }
int main(){
  int a = 2, b = 5, c = foo(a, b);  printf("%d %d %d\n", a, b, c);
}
```

(a) `2 5 7` (b) `5 7 7` (c) `2 5 ??` (d) `7 5 ??`

6

What does the following program fragment print?

```
int a = 2;
double b = 5.98;
int c = b / a;
printf("%d\n", c);
```

(a) `2.990000` (b) `3` (c) `2` (d) Compilation Error (e) `??`

7

What does the following program fragment print?

```
int a[] = {0, 1, 2, 3, 4, 5};
int *b = a;
int c = *b++;
printf("%d %d\n", *b, c);
```

(a) `0 1` (b) `1 1` (c) `0 0` (d) `1 0`

8

What does the following program print?

```
int main() {
  for (char c='a'; c<'d'; ++c) {
    switch (c) {
      case 'a': c += 2;
      case 'c': c += 1; break;
      case 'd': c += 3;
      case 'g': ++c; printf("%c,",c--);
      default: ++c;
    }
    printf ("%c\n" , c);
  }
}
```

(a) `a` (b) `d` (c) `e,e` (d) `h,h` (e) nothing

9

What does the following program print?

```
int main() {
  struct value { char field1; int field2; } strc;
  printf("%d\n", (int) sizeof(strc));
}
```

(a) `5` (b) `8` (c) `4` (d) Compilation Error

10

What does the following program print?

```
int main() {
  char *char_p;
  struct value {
     char a;
  } strc;
  struct value strc1={2};
  char_p = (char*) &strc1;
  printf("%d\n", *char_p);
}
```

(a) `2` (b) Compilation Error (c) `5` (d) `0`

11

What does the following program print?

```
int main() {
  int p = 5, *p1;
  int **p2 = &p1;
  printf("%d, %p, %p\n", **p2, *p2, p2);
  return 0;
}
```

(a) `5,` Address, Address (b) `Segmentation Fault`
(c) Compilation Error (d) Address, Address, `5`

12

What does the following program print?

```
int main() {
  char *char_p;
  struct node {
    char a;
  } strc;
  struct node strc1={'a'};
  struct node *np = &strc1;
  struct node **dnp = &np;
  putchar(*dnp->a);
}
```

(a) Compilation Error (b) `Segmentation Fault` (c) `a` (d) `\0`

13

What does the following program print?

```
int main() {
  if (sizeof(char)) printf("true, ");
  else printf("false, ");
  if (sizeof(char*) < sizeof(short*)) printf("true\n");
  else printf("false\n");
}
```

(a) `true, true` (b) `true, false` (c) `false, true`
(d) `false, false` (e) Compilation Error

14

What does the following program print?

```
int foo() {static int c; return ++c;}
int bar() {int d; return d;}
int a;
int main() {
  int b; foo();
  printf("%d %d %d %d\n", a, b, foo(), bar());
}
```

(a) `?? ?? ?? ??` (b) `?? ??, 0 ??` (c) `0 ?? 2 ??` (d) `0 0 0 0` (e) `0 0 2 ??`