Name: Solution (written questions)

Question 1. [3 points] What output is printed by the following program (which begins on the left and continues on the right)?

- A. 4
- B. 8
- C. The output can't be predicted
- D. The program does not compile

Question 2. [3 points] What output is printed by the following program (which begins on the left and continues on the right)?

```
#include <stdio.h>

int main(void) {
   int nums[4] = { 2, 4, 6, 8 };
   halveThem(int a[], int n) {
   for (int i = 0; i < n; i++) {
      a[i] = a[i] / 2;
   }
}

return 0;

int main(void) {
   int nums[4] = { 2, 4, 6, 8 };
   halveThem(nums, 4);
   for (int i = 0; i < 4; i++) {
      printf("%i ", nums[i]);
   }
   return 0;
}</pre>
```

- A. 1234
- B. 2468
- C. The output can't be predicted
- D. The program does not compile

Question 3. [3 points] What output is printed by the following program (which begins on the left and continues on the right)?

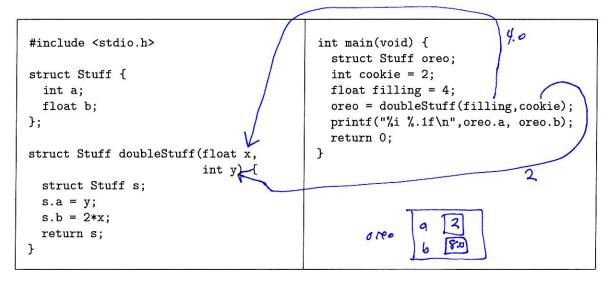
```
#include <stdio.h>

#include <stdio.h>

int main(void) {
    struct Box mine;
    mine = 42;
    mine = halveIt(mine);
    struct Box halveIt(struct Box b) {
        b = b / 2;
        return b;
    }
}
```

- A. 21
- B. 42
- C. The output can't be predicted
- D. The program does not compile

Question 4. [3 points] What output is printed by the following program (which begins on the left and continues on the right)?



- A. 24.0
- B. 44.0
- C. 28.0
- D. The program does not compile

Question 5. [6 points] The following program reads a single integer value (n). Complete the program so that the printf statement in main prints the value 2^n (2 raised to the power n). You can assume n will be non-negative. You must:

- 1. Add a call to multiplyByTwo to the for loop in main
- 2. Complete the definition of the multiplyByTwo function

Question 6. [3 points] Create a struct type called Student that has member fields to store the a student's age, GPA, sex (either 'M' or 'F'), and number of credits earned. Use appropriate data types and meaningful variable names for each.

Question 7. [3 points] Declare a variable of type Student (defined in Question 6) and assign values of your choice to the member fields.

Question 8. [4 points] Define a function called print_student_info() that takes a struct Student as a parameter and prints the student's age, GPA, sex, and number of credits earned in the following format:

age , GPA , sex , number Of Credits

For example, for a 20-year old student, the output might be

20,3.71,F,45

For Questions 9–14, circle True or False.

Question 9. [2 points] True of False: It is possible to return an array from a function as a return value.

Question 10. [2 points] True or False: If a is an array parameter, it is possible to find out how many elements a has using the syntax a.length.

Question 11. [2 points] (True or False: Structs allow you to define new data types.

Question 12. [2 points] True or False: It is permissible to assign the value of one struct variable to another struct variable, as long as the variables have the same types.

Question 13. [2 points] True or False: The ampersand (&) is the "address of" operator.

Question 14. [2 points] True or False: The asterisk (*) is the "address of" operator.