

For each question below, print the answer on the line provided. For this quiz, you can assume that the sizes of the data types (in bytes) are as follows: **char** = 1, **short** = 2, **int** = 4, **long** = 8, **float** = 4, **double** = 8. You may also assume that pointers are 8 bytes and all necessary header files have been included in the code snippets.

1. Given the valid declarations below, what is printed?

```
int a[] = {5, 1, 8, 5, 15, 13, 9, 7};
int *p = &a[4];
int *q = &a[6];
```

- a) `printf("%i", *(p + 2));`
- b) `printf("%i", *(q - 3));`
- c) `printf("%i", p - q);`
- d) `printf("%i", *p - *q);`

2. Given the declarations below, determine the values of each **sizeof** expression. **All expressions are valid and defined.**

```
long a[5];
short b[8] = {1, 2, 3};
int c[] = {0, 0, 0, 0};
int *d;
```

- a) `sizeof(a)`
- b) `sizeof(b)`
- c) `sizeof(c)`
- d) `sizeof(d)`
- e) `sizeof(*a)`
- f) `sizeof(*b)`

3. Given the valid initializations below, if the following assignment is legal (meaning there is no compiler warning or error) write **OK**. If the assignment is illegal (meaning there is a compiler warning or error) write an **X**.

```
int i = 5, j = 6;
const int ci = 10;
const int cj = 11;
const int *pci = &i;
int *pi = &i;
```

- a) `ci = 8;`
- b) `j = ci;`
- c) `pi = &ci;`
- d) `pci = &cj;`
- e) `*pci = 5;`

4. a) Declare a structure that has two doubles, named `speed` and `rate`. The structure tag should be `POWER`. Do **not** use a typedef in the declaration.

b) Write a single statement that declares a variable of the structure you declared above. Name this variable `Fred`.

c) Set the `speed` of `Fred` to 20.5 and set the `rate` of `Fred` to 16.25.

5. What does the following code snippet print?

```
char s[] = "HSJODI";
char *p;
for (p = s; *p; p++)
    --*p;
puts(s);
```

6. a) Declare a structure that has two doubles, named `speed` and `rate`. The structure tag should be `POWER`. Do **not** use a typedef in the declaration.

b) Write a single statement that declares a pointer to a `POWER` structure you declared above. Name this variable `pFred`.

c) Set the `speed` of `pFred` to 20.5

d) set the `rate` of `pFred` to 16.25.

7. What is the output from the `printf` statement below? The expression is valid and well defined.

```
int a = 3; int b = 2; int c = 1;
int d = 6; int e = 5; int f = 4;

a += b -= -c-- - ++d + -e-- / ++f;
printf("%i, %i, %i, %i, %i, %i", a, b, c, d, e, f);
```