

3. **Problem** (8 * 1 pts):

Which of the following implicit casts are (is) legal? Assume Foo is a well-defined struct. Unless declaration is provided with a question, assume

```
Foo f;
const Foo cf;
Foo* p_f;
const Foo* p_cf;
Foo* const cp_f;
```

A) legal B) illegal	3-1. _____	Foo const * p_cf2 = &f;
	3-2. _____	Foo const * p_cf2 = &cf;
	3-3. _____	f = cf;
	3-4. _____	cf = f;
	3-5. _____	p_f = p_cf;
	3-6. _____	p_cf = p_f;
	3-7. _____	p_f = cp_f;
	3-8. _____	cp_f = p_f;

4. **Problem** (2 * 3 pts):

Find equivalent operations

A) multiplying by 2 B) multiplying by 4 C) raising to the 3d power D) square root E) dividing by 8 F) dividing by 3 G) dividing by 4 H) multiplying by 3 I) multiplying by 8 J) dividing by 2	4-1. _____	Shifting an unsigned integer 3 times to the left
	4-2. _____	Shifting an unsigned integer 2 times to the right

5. **Problem** (2 * 2 pts):

Let x be a **char** (8 bits) and another **char** $mask = 7 = 00000111_2 = 2^2 + 2^1 + 2^0$. That is $mask$ has only 3 bits set to 1 – at positions 0,1,2. Find English sentence A...N (all referring to x) which is equivalent to the given C-statement.

Note: the meaning of "is true" – when the statement is used in an if-statement, the *then* part will be executed, which is equivalent to arithmetic "not equal to 0".

A) Bits 0,1,2 are all 0's B) Bits 0,1,2 are all 1's C) At least one of the bits 0,1,2 is 0 D) Always true E) Bits 3,4,5,6,7 are all 1's F) At least one of the bits 3,4,5,6,7 is 0 G) x equals to 0 H) At least one of the bits 0,1,2 is 1 I) Always false J) Bits 3,4,5,6,7 are all 0's K) At least one of the bits 3,4,5,6,7 is 1 L) x equals to 7	5-1. _____	($x \ \& \ \sim mask$) is true
	5-2. _____	($\sim(x \ \ \sim mask)$) is true

6. **Problem** (3 pts):

For the given expressions, specify the order of operations. See comment below an expression that introduces notations for the operation involved in the expression. Your answer should be a sequence of operations in the order they will be executed.

```
a << 3 + --c << b + 1;  
//      s1  p1  d   s2   p2    <-- notations for corresponding operations
```

A) d-p1,p2-s1,s2

B) p1,p2-d-s1,s2

C) d-s1,s2-p1,p2

D) p1,p2-s1,s2-d

E) s1,s2-d-p1,p2

F) s1,s2-p1,p2-d

_____ order of operations

7. **Problem** (3 pts):

For the given expressions, specify the order of operations. See comment below an expression that introduces notations for the operation involved in the expression. Your answer should be a sequence of operations in the order they will be executed.

```
~a << 3 ^ ~c << b ; <-- notations for corresponding operations  
//  n1 s1    x n2 s2  
}
```

A) n1,n2-x-s1,s2

B) x-s1,s2-n1,n2

C) s1,s2-x-n1,n2

D) s1,s2-n1,n2-x

E) x-n1,n2-s1,s2

F) n1,n2-s1,s2-x

_____ order of operations

8. **Problem** (4 * 2 pts):

Convert C declaration into English

- A) a pointer to a pointer to an array of 5 int
- B) a pointer to a function that takes an int and returns a pointer to an int
- C) a function that takes an int and returns a pointer to a pointer to an int
- D) an array of 5 pointers to functions taking an int and returning an int
- E) a pointer to a function taking int and returning an array of 5 ints
- F) a pointer to a function that takes an int and returns an int
- G) a pointer to an array of 5 pointers to functions that take nothing and return an int
- H) a pointer to an array of 5 pointers to functions taking an int and returning an int
- I) a pointer to a function taking int and returning a pointer to an array of 5 ints
- J) an array of 5 pointers to functions taking an int and returning a pointer to int
- K) illegal declaration
- L) a pointer to a pointer to a function that returns an int
- M) legal, but not on the list
- N) an array of 5 pointers to pointers to int
- O) a pointer to an array of 5 pointers to int

8-1. _____ int (**foo)[5];

8-2. _____ int ((*foo)(int))[5];

8-3. _____ int (*(foo)[5])(int)

8-4. _____ int * (foo[5])(int)

9. **Problem** (2 * 3 pts):

Choose corresponding C-style declaration for each of the English statements below

- A) `int* (*foo[5])(int)`
- B) `int* *foo[5](int)`
- C) `int* *(foo[5])(int)`
- D) `int (*foo[5])(int)*`
- E) `int (*foo[5])(*int)`
- F) `int (*foo(int*(int)))[5]`
- G) `int (*int foo(*(int)))[5]`
- H) `int int (* int *foo())[5]`
- I) `int (*foo((int*)(int)[5]))`
- J) `int* (*foo[5(int)])`
- K) `int* (*foo)[5](int)`
- L) illegal declaration
- M) `int (*foo[5]*)(int)`
- N) legal, but not on the list
- O) `int *(foo(int(*) (int)))[5]`
- P) `int (*foo(int(*) (int)))[5]`

9-1. _____ foo is an array of 5 pointers to functions taking int and returning a pointer to an int

9-2. _____ foo is a function taking a pointer to (a function taking int and returning int) and returning a pointer to an array of 5 ints

Copy your multiple choice answers from exam into the table below
 Detach this page and take it with you.
 Submit multiple choice answers on pontus:

Code = 1

Q1_1	
Q1_2	
Q1_3	
Q1_4	
Q1_5	
Q1_6	
Q2_1	
Q2_2	
Q2_3	
Q2_4	
Q3_1	
Q3_2	
Q3_3	
Q3_4	
Q3_5	
Q3_6	
Q3_7	
Q3_8	
Q4_1	
Q4_2	
Q5_1	
Q5_2	
Q6	
Q7	
Q8_1	
Q8_2	
Q8_3	
Q8_4	
Q9_1	
Q9_2	