CIS 1201 Finals Mock Exam – Test 1 of 2 (70 points, 40 minutes)

Instruction: Supply the correct answers to each question. Give only what is being asked.

Place your answers at the designated areas of the answer sheet provided.

Given the declaration: `char a, *b = &a, **c = &b;`

1. Using variable c, write the C statement that will store from keyboard input the value of a.
2. Using variable c, write the C statement that will display the value of a.
3. Determine the value of sizeof(c)==sizeof(b).

Given the declaration:

```
char a[20]="This one", b[20]=" That one", *c = a + 5;
strcat(a, b + 4);
```

4. Determine sizeof(c);
5. Determine sizeof(a);
6-7. Determine strlen(a);
8-9. Determine strlen(c);

In what header files are the following found?

10. character functions
11. definition of datatype FILE

Function specification: Function sentenceCase() accepts a string as a parameter, then change the beginning letter to its corresponding uppercase equivalent only if it was in lowercase.

12-14. Fill in the blank with the missing statement to complete the function. (1 statement only) Use character functions in your answers.

```
void sentenceCase(char*str){
   ____________________________________
}
```

The following declares structured array Accounts1 and Accounts2, each holding ten accounts, each account with a corresponding username:

```
struct user{
  char username[10];
}Accounts1[10], Accounts2[10], tempAcc1, *tempAcc2 = &tempAcc1;
```

Assume that the Accounts1 array are populated with elements. Write the C statement that will

15-16. Copy the contents from the Accounts1 array to the Accounts2 array.
17-18. Let tempAcc1 store the details of the fourth account from the Accounts2 array.
19-20. Using tempAcc2, store inside the tempAcc1 structure the username of the last account from the Accounts2 array.
21. List all the header files that are needed to execute the C statements above.

On bitwise and other operators - Evaluate the following:

22. `2021 << 2`
23. `384 >> 4 - 1`
24-25. `26 & 13 | 22 ^ 15`
26-27. `10 + 10 & -10 ^ 10`

Function specification: Function getBitFromInteger() returns the value of the n^{th} bit from the right based on the 32-bit pattern of a given number.

28-30. Fill in the blank with the missing statement to complete the function. (1 statement only)

```
int getBitFromInteger(int number, int n){
   ____________________________________
}
```

Given the declaration:

```
enum colors{red, orange, yellow=5, green, blue, indigo, violet=2021};
struct color{
   enum colors myColor;
   struct color *nextColor;
}colortype,*colorlist;
```

31. How many data types is/are declared in the declaration above?
32. Determine the value of indigo.
33. How many bytes are allocated to colorlist?
34. How many bytes are allocated to colortype?
35-36. Assume the linked list declared here is not yet populated, write the C statement that will allocate memory for a new node. Use only the datatypes.

NOTE: If there are no bytes allocated, or if dynamic memory allocation is not possible with the declaration above, write N/A.

37-38. A linked list with head pointer L is populated with 100 nodes, each node holding two distinct characters. In total, what is the minimum number of bytes of memory space that will be consumed in the heap?

39. What is the integer equivalent for SEEK_END?

Given the declaration:

```
float a[6] = {9.0, 4.0, 2.0, 6.0, 3.0};
```

40-41. How many necessary swaps are there when the array is sorted in ascending order using bubble sort technique that pushes heavier elements from lower index to higher index?
42-43. If the elements of the array will be sorted in ascending order using selection sort technique, list down the order of elements in the array right after the third iteration of the outer loop.

Given the code snippet below:

```
int a, b, c, x=2, ctr=1, sum=0;
int myArr[x][x][x];
for(a=0; a<x; a++){
  for(b=0; b<x; b++){
    for(c=0; c<x; c++){
       myArr[b][c][a] = ctr++;
    }
  }
}
for(a=0;a<x;a++){
  sum += myArr[--c][a][a];
}
printf("%d,%d,%d", sum, b, ctr);
```

Answer the following:

44-45. Determine the value of myArr[1][0][1].
46-48. What is the display?

Given the declaration:

```
int arr[5][5] = {{-1}, {-2, -3}, {-4, -5, -6}, {-7, -8, -9, -10}};
```

49-50. Determine sizeof(arr) + sizeof(arr[1]) + sizeof(arr[2][3]).
51. How many nonnegative elements are present in the array?

True or False:
52. arr == arr[0]
53. arr[3] == arr[3][0]

Assume that the value of *arr* is 2FE000. Determine the following:
54. Value of arr[2][2]
55. Address of arr[2][2]
56. Value of arr + 1
57. Value of arr[1] + 1

Answer the following:
58-59. Declare a pointer variable *ptr* with an appropriate datatype that can be used to navigate through the 2D array above, then have it initialized to the beginning address to the array *arr*.

60-62. After the statement above and then the statements

```
ptr++;
(*(*(ptr+1)+1))--;
```

Is a component of the array arr modified? (YES/NO)
If the answer is YES, write the value of the modified component; otherwise, write NO.

Function specification: Function moveAtoB() will remove all the contents of the linked list pointed to by A and have them appended to the end of the linked list B without changing the order of the elements found in A. See the data structure definition and example below:

Data structure definition:	Before: A-> 1->2->3->4->5->● B-> 6->7->8->9->● After: A is empty B-> 6->7->8->9->1->2->3->4->5->●
typedef struct number{ int num; struct number* nextnum; }numNode, *numList;	

63-70. Fill in the blanks below to complete the function definition. As seen, there shall be only two statements to be appended after the for loop.

```
void moveAtoB( __(63)__ , __(64)__ ){
   __(65)__ trav;
   for( _________(66-67)_________ ){}
   _____(68)_____
   ____(69-70)____
}
```

-- END OF TEST 1 --

-- REVIEW YOUR ANSWERS!! --