

1.

What is the output of the following code segment

```
char *msg;  
char *s = "Winter 2017!";
```

```
msg = &s[2];  
printf("%c", *(msg+6));
```

(A) 2 (B) 2017! (C) 0 (D) 017! (E) None of the above

2. Will the following code compile? If you think that it will not compile then explain why?

```
char *s= "Great view!";  
for (i = 0; i < strlen(s); i++) {  
    printf("%c", *s);  
    s++;  
}
```

(A) Yes (B) No

3. Will the following code compile? If you think that it will not compile then explain why?

```
char s[25]= "Great view!";  
for (i = 0; i < strlen(s); i++) {  
    printf("%c", *s);  
    s++;  
}
```

(A) Yes (B) No

3. Given

```
float age[5];  
float *data = age;
```

Which of the following statement does not correctly loads data to the array age (there is more than one)

A. for (i = 0; i < 5; i++) {
 scanf("%f", &age[i]);
}

B. for (i = 0; i < 5; i++) {
 scanf("%f", data);
 data++
}

C. for (data = age; data < data+ 5; data++) {
 scanf("%f", data);
}

- D. `for (i = 0; i < 5; i++) {
 scanf("%f", age);
}`
- E. `for (data = age; data < data + 5; data++) {
 scanf("%f", &data[0]);
}`
- F. `for (i = 0; i < 5; i++) {
 scanf("%f", &age[0]);
}`
- G. `for (i = 0; i < 5; i++) {
 scanf("%f", &data[i]);
 data++
}`
- H. `for (i = 0; i < 5; i++) {
 scanf("%f", &age[i]);
}`

4. Given

```
typedef struct node{
    struct node *next;
    int data;
} Node;

void foo(struct node* head)
{
    printf("%d ", head->data);
    if(head == NULL) return;
    printf("%d ", head->data);

    foo(head->next);
}
```

What is the output of the function foo(H), where H is the head of the following a linked list
H->1->2->3->4->5->NULL

- A. 1 2 3 4 5
B. 5 4 3 2 1
C. 1 2 3 4 5 5 4 3 2 1
D. Nothing will be printed
E. None of the above

5. What is stored in each frame? Circle all the correct answers

- a. Local variables
- b. Static variables
- c. Return address
- d. Function parameters
- e. Global variables
- f. Function code

6. What will be the output of the following code

```
Short age [6] = {25, 28, 29, 30, 31, 32};
```

```
int *p = NULL;  
p = &age[4];
```

```
p += 2;  
printf("%d\n", *p);
```

- A. 28
- B. 29
- C. 30
- D. 31
- E. None of the above

7. Which of the following statements is an array of 10 pointers to an int:

- A. `int arr[10]*;`
- B. `int *arr[10];`
- C. `int &arr[10];`
- D. `int arr[10]&;`
- E. `int arr[10];`
- F. None of the above

8. Given the following code, which statement will print True

```
int x = 5;  
int y = 6;
```

```
int *p = &x;  
int *q = &y
```

```
int **pp = &p;
int **qq = &q;
```

- A. If (*pp == p) printf ("True\n");
- B. If (**pp == *q -1) printf ("True\n");
- C. If (*q == *p) printf ("True\n");
- D. If (*pp == *p) printf ("True\n");
- E. If (*pp == x) printf ("True\n");
- F. If (**qq == y) printf ("True\n");
- G. None of the above

9. What will be the output of the following code
Short age [6] = {25, 28, 29, 30, 31,32};

```
int *q = NULL;
q = &age[4];
printf("q-p = %d \n", q-p);
```

- A. q-p = 4
- B. q-p = 5
- C. q-p = 6
- D. q-p = 10
- E. None of the above

10. The parameter argv in the function main(int argc, char *argv[]) is

- A. An array of characters
- B. A string
- C. An array of pointers to character
- D. A character pointer
- E. None of the above

11. What will be the output of the following code

```
#define multiply(x, y) x * y

int i = 3;
int j = 2;
int k = 0;

k = multiply (i, j+1);
printf("%d",k);
```

- A. 6

- B. 7
- C. 8
- D. 9
- E. None of the above

12. Which statement creates an `NewArray` data type that contains 100 doubles

- A. `typedef double[100] NewArray ;`
- B. `typedef double NewArray;`
- C. `typedef double NewArray[100];`
- D. `typedef double *NewArray`
- E. None of the above

13. A field that is not a pointer in the structure `struct X` can be

- A. Only a primitive C data types
- B. Any valid C datatype including programmer defined datatypes
- C. Any valid C datatype except the type `struct X`;
- D. Any valid C datatype except union;
- E. None of the above

14. Which option below correctly completes the statement - The do-while loop is used when _____

- A. The program wants to execute the block of code at least once
- B. the block of code consists of two or more statements
- C. a "for" loop cannot be used
- D. the program needs to count the number of iteration that block of code is executed
- E. None of the above

15. Given four statements below determine which statement combination is correct

1. If a variable is declared as an `extern` in one file then the variable is a global variable
2. A global variable that is declared in a file as a `static` (e.g., `static int numCourses`) is only visible to the functions in the file
3. A `static` variable in a block of code can appear only once in a program

4. A block of code can have only one static variable

- A. Statement 1 is true and statement 3 is true
- B. Statement 2 is true and statement 4 is not true
- C. Statement 2 is true and statement 1 is not true
- D. Statement 3 is true and statement 3 is not true
- E. None of the above

16. Complete the following sentence When passing a two dimensional array that was declared as `int arr[100][100]` to a function

- A. the first dimension size must be provided
- B. the second dimension size must be provided
- C. both dimensions must be provided
- D. it does not matter if the size of the dimensions is provided
- E. None of the above

17. Which option correctly finds the location of an element `k` in a one dimensional array of long numbers (array name is `arr`)

- A. Address of element `k` = array start address + `k`
- B. Address of element `k` = array start address + `k*sizeof(long)`
- C. Address of element `k` = array start address + `k*sizeof(arr)`
- D. Address of element `k` = array start address + `sizeof(long)`
- E. None of the above

18. You invoked the program `myProgram` using the following command

`myProgram file1.txt file2.txt`

What is the value of `argv[1]` that is passed to the function `main`?

- A. `myProgram`
- B. `file1.txt`
- C. `file2.txt`
- D. None of the above

19. The notation `*(arr[3]+1)` is the same as

- A. `*arr[3][1]`
- B. `arr[3][1]`
- C. `arr[1][3]`
- D. `arr[3][0]`
- E. None of the above

20. Let `arr` be declared as `int arr[20]` then the statement `*(arr+20) = 20;`

- A. generates a runtime error
- B. generates a compiling error (syntax error)
- C. sets the last element in the array to 15
- D. overwrites the memory beyond the end of the array
- E. None of the above

21. True or False - write beside each option whether it is true or false

1. If the frame stack contains 250 frames then the program has called a recursive function
2. The function `memcpy(dst, src,)` copies bytes from address location ***src*** to address location ***dst***. The number of copied bytes is ***size***.
3. The first function in the frame stack is `main()`
4. If a program is called with two command line parameters (e.g., ***cp f1.txt f2.txt***) the value of `argc` that is passed to `main` is 2.
5. When a program executes then the frame stack must contain at least two functions
6. The scope of a variable is the block of code that it is declared in.
7. Function parameters are stored in the frame stack
8. Static variables that are declared in a function are stored in the frame stack
9. The function `malloc()` allocates memory from the heap and initializes all the bytes to 0
10. The statement `int *p = (int *) malloc(100);` allocates memory for 100 integers

22. Given that size of a short is 2 bytes, int 4 bytes, long 4 bytes, float 4 bytes and double is 8 bytes. What is the size of the following union structure if the alignment is a multiple of 4?

```
union x {
    short age;
    long salary;
    double stockOptionValue;
```

```
};
```

- A. 8
- B. 14
- C. 16
- D. None of the above

23. The statement `strcmp(s1, s2)` returns 0 if

- A. s1 has the same length as s2
- B. s1 is the same as s2
- C. s1 is NULL or s2 is NULL
- D. None of the above

24. The statement `strcmp(s1, s2)` returns 1 if

- A. s1 is shorter than s2
- B. s1 is smaller than s2
- C. s1 is greater than s2
- D. None of the above

25. Nodes in a linked list are stored

- A. in an array
- B. anywhere in memory that is available
- C. in a contiguous memory segment
- D. in the data section of the frame stack
- E. None of the above

26. You invoked the program `myProgram` using the following command
`myProgram file1.txt file2.txt`

What is the value of `argc` that is passed to the function `main`?

- E. 0
- F. 1
- G. 2
- H. 3
- I. None of the above