Kafrelsheikh University		Date: 9/1/2019
Faculty of Engineering		Time allowed: 3 hours
Electrical engineering Dept.		Full mark: 85
Year: 1st Year-Electric.	Subject: Data structures & Algorithms	Final-Term Exam: 4 pages

Answer the following questions:

Question [1] (25 marks) [ILOs: a1,b1,b2,c1,c2,c3,c4]

a) What is the meaning of: data structures, stacks and queues?

b) What is the output of the following C program?

```c
#include<stdio.h>
int a[5];
void main(void)
{
    static int b[5];
    int c[5];
    int i;
    for (i=0; i<5; i++)
    printf("a[%d]=%d\t b[%d]=%d\t c[%d]=%d\n", i, a[i], i, b[i], i, c[i]);
}
```

c) Draw a flowchart, write an algorithm and write a C program to compute a factorial to any positive integer number.

Question [2] (60 marks) [ILOs: a1,b3,b4,b7,c1,c2,c3,c4]

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- ## Write True (T) or False (F) for the following sentences:

1) Functions cannot return more than one value at a time.

2) A function can be defined inside another function.

3) After each iteration in bubble sort, at least one element is at its sorted position.

4) The correct size of the datatypes is   int < char < double.

5) Process of removing an element from stack is called Push.

6) A do-while loop is used to ensure that the statements within the loop are executed at least twice.

7) Every function must return a value.

8) The following C loop is run for 1 time: while(1) {printf("x=%f ",x);}

9) Maximum number of arguments that a function can take is 10.

10) = = is used for comparison, whereas, = is used for assignment of two quantities.

11) An algorithm is a sequence of unambiguous instructions for solving a problem.

12) Process of inserting an element in stack is called Pop.

13) Time complexity of bubble sort in best case is O(n).

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14) The following C loop is run forever: **for(;;) printf(" welcome");**

15) There are 2 errors in the following C code: **scanf("%d, %d",&a,b);**

16) An algorithm should exhibit at least one output.

17) Flowchart is a mathematical tool representing the defined solution of a problem.

18) There are no errors in the following C code: **printf("x=",x);**

19) There are no errors in the following C code: **For(i=5; i<=10; ++)**

20) There is 1 error in the following C code: **scanF("%d",&a);**

21) A queue is FIFO (First In First Out) list.

22) Switch statement can have any number of case instances.

23) continue keyword skip one iteration of loop.

24) The keywords can be used as variable names.

25) Functions can be called either by value or reference.

26) The output of: **printf("%10.5f " , 65.5);** is 65.55555

27) There are no errors in the following C code: **if(x==5) printf("%d",x);**

28) continue; statement is used to break any loop.

29) There are 2 errors in the following C code: **int area(int L, int W) L*W;**

30) A Stack is FILO (First In Last Out) list.

- ## Select the suitable answer of the following:

31) The output of the following C program is:
    ```
    #include<stdio.h>
    int a[3]; void main(void){int i; for (i=0; i<3; i++) printf("a[%d]=%d", i, a[i] );}
    ```
    a) a[0]=1a[1]=2a[2]=3   b)000   c) a[0]=0a[1]=0a[2]=0   d)123

32) The format identifier **%i** is also used for _____ data type?
    a) int   b) double   c) float   d) char

33) Which data type is most suitable for storing a number 65000 in a 32-bit system?
    a) double   b) int   c) short   d) long

34) What is the size of an int data type?
    a) 4 Bytes   b) 8 Bytes   c) 1 Byte   d) Depends on the system/compiler

35) What is the size of float in a 32-bit compiler?
    a) 1 Byte   b) 2 Bytes   c) 4 Bytes   d) 8 Bytes

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36) %f access specifier is used for
   a) Integer type   b) Character type   **c) Floating type**   d) String type

37) What is the output of: **int main() {float a = 5.47772222222; printf("%f", a); }**
   a) 5.4777222   **b) 5.477722**   c) 5.478   **d) 5.48**

38) Which data type is suitable for storing a number like? **88.8888888888**
   a) double   **b) float**   c) int   d) Both (b) and (c)

39) What is the output of this C code? **void main() { int i = 9; i = i / 4; printf("%d\n", i); }**
   a) 2.25   **b) 2**   c) 1   d) Compile time error

40) What is the value of x in this C code? **void main() { int x = 6 *5 / 2 + 5; }**
   a) 6.75   b) 1.85   **c) 19**   d) 20

41) Which of the following is not an arithmetic operation?
   a) a *= 20;   **b) a /= 30;**   c) a % 40;   **d) a != 50;**

42) A procedure for solving a problem in terms of actions and their order, is called as
   a) Algorithm   b) Program instructions   c)Template   d) All of them

43) An artificial and informal language that helps programmers to develop algorithms, is called
   a) Instruction code   b) Pseudocode   c) Algocode   d) Control code

44) Which of the following is used to terminate the function declaration?
   a) :   b))   c) ;   d) }

45) Which is more effective while calling the functions?
   a) call by value   b) call by reference   c) call by pointer   d) None of them

46) How many minimum number of functions are need to be presented in C language?
   a) 0   b) 1   c) 2   d) 3

47) The switch statement is also called as:
   a) choosing structure   b) certain structure   c) selective structure   d) none of the mentioned

48) Which of the following correctly declares an array?
   a) int array;   b) int array[10];   c) array{10};   d) array array[10];

49) What is the index number of the last element of an array with 8 elements?
   a) 6   b) 7   c) 0   d) Programmer-defined

50) Which of the following accesses the fifth element stored in array?
   a) array[4];   b) array[5];   c) array(5);   d) array;

51) Which of the following gives the memory address of the first element in array?
   a) array[0];   b) array;   c) array(2);   d) array[1];

52) Which looping process is best used when the number of iterations is known?
   a) do-while   b) while   c) for   d) None of these

53) It is guaranteed that a ____ has at least 1 Byte and a ____ has at least 2 Bytes.
   a) int, float   b) char, int   c) bool, char   d) char, short

54) A well designed computer program must be:
   a) correct and accurate   b) easy to understand   c) flexible   d) all of them

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55) Number of error in following C program is:

```
#include<studio.h>
void main(){print ("Good Luck in Your C course.\n");}
```

a) 1   b) 2   c)4   d) 5

56) Number of error in following C program is:

```
#include<stdio.h>
void Main(){printf("How are you?\n");}
```

a) 2   b) Zero   c) 1   d) 3

57) Number of error in the following C code is: `printf("How are you?\n");`

a) Zero   b) 1   c) 2   d) 3

58) Number of error in the following C code is: `prinTf("How are you?\n")`

a) Zero   b) 1   c)2   d)3

59) The output of the following C program is:

```
#include<stdio.h>
void main(void){int i=0; while(1){printf(" %d", ++i); if(i==4) break;}}
```

a)1 2 3 4   b)1 2 3   c)i=1 i=2 i=3 i=4   d)Non of these

60) The output of the following C program is:

```
#include<stdio.h>
void main(void){int i; for(i=1; i<=3; i++)
{printf("%d", i); if(i==2) continue; printf("%d",i);}}
```

a)   112233   b) 11233   c) 123123   d)332211

With my best wishes <<<<<<<<< & & >>>>>>>>>> **Dr.Eng. Tamer Medhat**