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INDIAN STATISTICAL INSTITUTE
MS-LIS 1st Year, 2017-2018 (Semester - II)
Data Structures and Computer Programming
Mid Semester Examination
Full Marks : 30
Time Allotted: 1h 30 min

SECTION - A

(Answer any two from this section) 2x7=5-15

- A1 Make all lower case letters of a user given string to upper case letters and print the string. (ASCII value: 'A':7;65-90, 'a':97-122).
Write a C function which takes two array A and B as input parameter and swap the array elements among them. e.g: A={1,2,3,4,5} and B={2,3,4,5,6}, after swapping arrays will be A={2,3,4,5,6} and B={1,2,3,4,5}.
- A2 Given an array A[]={3,1,4,2,5}. Sort this array by insertion sort algorithm and show all the steps clearly. Write the C function for this sorting algorithm.
- A3 Write C code to print first n no.s of Fibonacci series both iteratively and recursively. Where, $F_n = F_{n-1} + F_{n-2}$ with initial values $F_0 = 0$ and $F_1 = 1$.
- A4 Given an array, find the minimum no. and place it at 0th index and shift rest of elements. e.g: input: A={6,7,9,1,8} output A={1,6,7,9,8}}

SECTION - B
(Multiple choice questions)

- B1.B5 pick appropriate outputs from given options, if the programmes are run on gcc compiler. 5x2=10

```

B1. #include <stdio.h>
void main ()
{
    int i, index = 0;
    for (i = 0; i < 10; i++)
    {
        int j = 0;
        while (i++ < 5)
            index++;
    }
    printf ("index = %d\n", index);
}

```

Options:

- a) 10
- b) 15
- c) 50
- d) None of the above

```

B2. #include <stdio.h>
#define square(x) x*x
void main ()
{
    int i;
    i=64/square(4);
    printf("%d",i);
}

```

Options:

- a) 4
- b) 64
- c) 16
- d) None of the above

```

B3. #include <stdio.h>
void main ()
{
    int x = 55, y = 17;
    printf ("%d\n", func (x, y));
}
func (int x, int y)
{
    int q = 0;
    if (x < y)
        return 0;
    else
        return func (x - y, y) + 1;
}

```

Options:

- a) 3
- b) 4
- c) 39
- d) None of the above

```

B4. #include <stdio.h>
void main()
{
    int i=10;
    switch(i)
    {
        case 4: printf ("1");
        default: printf ("2");
        case 2: printf ("3");
        case 1: printf ("4");
    }
}

```

Options:

- a) 2
- b) 234
- c) 4
- d) None of the above

B5.

```

#include <stdio.h>
void main()
{
    int i=10;
    printf("%d %d %d ", i++, i, ++i);
}

```

Options:

- a) 10,11,12
- b) 12,11,11
- c) 11,12,12
- d) None of the above

B6-B10 choose correct option related to each statement. **5x1=5**

B6. Which of the following is not true about preprocessor directives:

- a) They begin with a hash symbol.
- b) They are processed by a pre-processor.
- c) They form an integral part of the code.
- d) They have to end with a semi colon.

B7.

- continue statement is used
- a) To go to the statement in a loop
- b) Come out of a loop.
- c) Exit and return to the main function
- d) Restarts iterations from beginning of loop

B8.

- The main() function can call itself recursively.
- a) True
- b) False

B9. An array declared as A[10][10] can hold a maximum of 10 elements.

- a) True
- b) False

B10. Which among the following is a unconditional control structure

- a) do-while
- b) if-else
- c) goto
- d) for