# M.Sc. 3rd Semester Examination, 2018

# MATHEMATICS

## Paper : 306ME (ID)

## Course ID : 32166

**Time: 2 Hours**             **Full Marks: 40**

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words
as far as practicable.*

*Notations and Symbols have their usual meanings.*

Answer *any five* questions.         8×5=40

1. (a) What is an operator in C?

   (b) Differentiate between '=' and '= =' operator with proper example.

   (c) Explain Associativity of Operators.

   (d) What will be the output of the following program?
   ```
   #include <stdio.h>
   main()
   {
   int x=10, y=20;
   printf("%d", (x>y)? x:y);
   }
   ```
                             2+2+3+1=8

2. (a) What is type casting? Explain different types with proper example.

   (b) What will be the output of the following program?
   ```
   #include <stdio.h>
   main()
   {
   int i = 100, m, n;
   m = 10+ (i++);
    n = 10+ (++i);
   printf("m = %d, n = %d\n", m, n);
   }
   ```

   (c) Write a C program to find the circumference of a circle. The radius of the circle is r. 4+2+2=8

**3.** (a) What is a variable? Can reserve keywords be used as variable name?

(b) Write a C program that finds the roots of a quadratic polynomial $ax^2 + bx + c = 0$.
The program accepts values of a, b and c from the terminal and then proceeds depending on the values of a, b and c.

- It next finds the discriminant $d = b^2 - 4ac$.
- If $d > 0$, the program finds the real distinct roots. It prints out the roots with appropriate message.
- If $d = 0$, the roots are real and equal. It prints out the roots with appropriate message.
- If $d < 0$, the roots are complex conjugate. Prints out the appropriate message only.

(c) What is sizeof in C?                                                    3+4+1=8

**4.** (a) What are the Entry-controlled and Exit-controlled loops? Differentiate with proper example.

(b) Write a program to find the Fibonacci Series up to $n$th term.                 4+4=8

**5.** (a) Explain the utility of break statement in a switch case.

(b) Consider the following program:

```
#include <stdio.h>
main ()
{
int a, b, c, d;
int r, s, t;
scanf("%d%d%d%d", &a, &b, &c, &d);
if (a > b) r = a; else r = b;
if (c > d) s = c; else s = d;
if (r > s)t = r; else t = s;
printf("%d\n", t);
}
```

Suppose that the user inputs the values 5, 3, 5, 9 for a, b, c and d respectively. What value for t does the program print?

(c) Write a C program to check whether a three-digit number is a palindrome number or not.

                                                                          2+3+3=8

**6.** (a) How array variable differs from ordinary variable?

(b) Given a list of $n$ elements. Write a C program to insert an element to a user-defined position.

(c) Write a C program to find the maximum element from a list on $n$ elements.         2+4+2=8

**7.** (a) Why null character is required? Write a program to count the number of words in a multi-word string.

(b) Write a C program to find the transpose of a $n \times n$ matrix.    2+3+3=8

**8.** (a) Differentiate between user-defined function and library function with proper examples.

(b) What is recursion? How the factorial of a number is defined recursively?    2+6=8

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