

2022

**Applied Mathematics with Oceanology and
Computer Programming**

[P.G.]

(CBCS)

(M.Sc. First Semester EndExaminations-2022)

MTM – 104

(ADVANCED PROGRAMMING IN C AND MATLAB)

Full Marks: 50

Time: 02 Hrs

*The figures in the right hand margin indicate marks
Candidates are required to give their answers in their own words as
far as practicable
Illustrate the answers wherever necessary*

1. Answer any four questions

4x2=8

a) Find the output of the following statements,

```
main ( )  
{ int a = 15, b=10, c, d;  
C = ++a -b; d = b++ +a;  
printf(" a* = b = %d\n", a* = b);  
printf ("%d\n", (c>d)? 1 : 0);  
}
```

b) Write a program in C to find the smallest of 3 numbers.

(2)

- c) Give the syntax of for loop and explain how it works.
- d) Consider the program segment
for ($i= 1; i \leq 20; i = i+1$);
printf("%d", i);
what will be output? Justify.
- e) What is difference between $i ++$ and $++i$? Explain with example.
- f) What is ternary operator? Write a program using it.

2. Answer any four questions **4x4=16**

- a) The exponential power of x is approximated by the following infinite series $e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots$. Write a program to find out how many terms will be sufficient in the right-hand side of the given expression to ensure that the result is within the 5% error of the exact value.
- b) What is functions Returning pointers? Use it to find largest among three integer by C-programming.
- c) Give an example of array of pointers and pointers to pointers.
- d) What is the procedure to find of a matrix? Write a function to find $n!$.
- e) Explain the relational and logical operations with examples.

(3)

- f) Write a MATLAB PROGRAM to generate a pascal triangle.

3. Answer any two questions **2x8=16**

- a) What is difference between Array and structure? Write a C-program to calculate the area of circle, rectangle or triangle depending upon the user's choice using structures. 3+5
- b) i) What is purpose of the *scanf* function? How is it used within a C program? Compare with the *getchar* function.
ii) Using a function to calculate the real roots of the quadratic equation $ax^2 + bx + c = 0$, write a program to display the real roots. 3+5
- c) i) Write a program that will calculate the sum of every third integer, beginning with $i = 2$ for all values of i that are less than 100. Write the loop (*i*) using a while statement and (*ii*) using a for statement.
ii) Write a program to find the difference between two dates using structure. 5+3

[Internal Marks – 10]