

U.G. 3rd Semester Examination - 2022**MATHEMATICS****[HONOURS]****Skill Enhancement Course (SEC)****Course Code : MATH-H-SEC-T-1A&B**

Full Marks : 40

Time : 2 Hours

*The figures in the right-hand margin indicate marks.**Symbols and notations have their usual meanings.***Answer all the questions from the Selected Option.****OPTION-A****MATH-H-SEC-T-1A****(Programming in 'C')**

1. Answer any **five** questions: 2×5=10
- a) What are the properties that an Algorithm should have?
 - b) Explain the coding schemes ASCII and EBCDIC.
 - c) Find x and y , Where $(x .y)_{10} = (10111.1101)_2$
 - d) Explain two types of numeric constants with examples.
 - e) Differentiate between Data and Information.

[Turn over]

- f) Explain nested if— else with a suitable example.
- g) What will be the output of the following C code?

```
int main()
{
constant int ary[4]={ 1, 2, 3, 4};

int*p;

p=ary+3;

*p=5;

printf(“%d\n”, ary[3]);

}
```

- h) Write the syntax of while statement in C and draw the corresponding flow diagram.

2. Answer any **two** questions: 5×2=10

- a) What are the differences between User-defined and Standard Library functions in C? Explain with a suitable example. 3+2
- b) Write the syntax of for-loop in C. Write a C program to find Fibonacci numbers using for-loop. 1+4
- c) How do you initialize a two-dimensional array in C? Can it be passed through a function? Explain with a suitable example. 2+3

- d) Write an Algorithm and draw the corresponding Flowchart to find the largest of three distinct numbers. 2+3

3. Answer any **two** questions: 10×2=20

- a) i) Write a C program to find the sum of the first 1000 natural numbers.
- ii) Distinguish between Call by Value with Call by Address.
- iii) Write a C program to swap two numbers by using Call by Address. 3+3+4
- b) i) Explain break and continue statements.
- ii) Write a C program to display prime numbers between 1 and 200 using break and continue statements. 4+6
- c) i) Write the differences between Compiler and Assembler.
- ii) Design a Flowchart to find the G.C.D of two positive integers.
- iii) Write a C program to find the sum of digits of a number. 3+3+4
- d) i) Write the three applications of C programming language.

ii) Write a short note on Software.

iii) Write a C program to find the trace of a square matrix. 3+3+4

OPTION-B
MATH-H-SEC-T-1B
(Python Programming)

1. Answer any **five** questions: $2 \times 5 = 10$

- a) What is meant by complexity of an algorithm?
- b) How many bits are there in 1 terabyte?
- c) Convert $(94AF)_{16}$ into Octal.
- d) Differentiate between mutable and immutable objects in Python.
- e) What is a numeric literal in Python?
- f) Differentiate between list and tuple in Python.
- g) What is the difference between *break* and *continue*?
- h) What will be the value of the following Python expression: $4+3\%2$? — Explain.

2. Answer any **two** questions: $5 \times 2 = 10$

- a) Explain *Dictionary* in Python with a suitable example program.
- b) List and explain four built-in string manipulation functions in Python with example.
- c) Draw a flowchart to check whether a given number is prime or not.

3. Answer any **two** questions: 10×2=20

- a) Explain positive and negative indexing in Python List access with suitable examples. Discuss List slicing with example. 6+4
 - b) Write a program in Python to generate the first 'N' Fibonacci numbers.
 - c) Write a program in Python to count the number of vowels in a given string.
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