B.Sc. Semester V (General) Examination 2021
Subject: Physics
Paper: SEC-3 (Computational Physics)

Time: 2 hours Full Marks- 40

The questions are of equal value. Candidates are required to give their answers in their own words as far as practicable.

Answer any ***eight*** of the following questions $5 \times 8 = 40$

1. What is the default variable type for integers and real numbers in FORTRAN? How do you write a comment in FORTRAN programming?

2. What is DO loop? Write the general form of DO loop in FORTRAN. What will be the output of the following programme?

```
      integer i, n, s
      s= 0
      n= 5
      do 10 i = 1, n
            s= s + i
            write(*,*) 'i=', i
            write(*,*) 's=', s
10    continue
```

3. What is an array? How is an array defined in FORTRAN? Where should the array declaration occur in FORTRAN programming?

4. What is a flowchart? Draw the flowchart symbols for i) start/end symbol ii) process symbol iii) decision symbol.

5. Write an algorithm to determine the sum of two two-dimensional matrices.

6. What is an index for a document? Which package in LaTex is used to create an index? Which command is used to render index?

7. What task the following commands perform in Linux? i) ls ii) mkdir iii) rmdir iv) man v) locate

8. Write the following expressions in FORTRAN- i) a-b/c+d ii) $-b+\sqrt{(b^2 - 4ac)}$ iii) e^{-n} (e is exponential).

9. Write an algorithm to calculate the roots of a quadratic equation $ax^2 + bx + c = 0$. Where a, b, c are taken as input.

10. What is the command to open a file in FORTRAN? Write the general form of the command. Which command is used to append data into the file? Write the command to close the file.