

**RAIGANJ SURENDRANATH MAHAVIDYALAYA**

**INTERNAL EXAMINATION-2022 SUBJECT-MATHEMATICS (H) DSE- 01  
SEMESTER-05 FULL MARKS-14**

**TIME-45 MINUTES**

Answer all the questions from question number 1.

1X6=6

- 1.
- a. Define order of an element of a group.
- b. Define Kernel of a homomorphism.
- c. What is automorphism ?
- d. What is an ideal?
- e. What is the order of 3 in the multiplicative group of integers modulo 5 ?
- f. What is division ring ?

Answer any two question from following questions. 2X4=8

2. Factorize  $x^2 + x + 5$  in  $F[x]$ , where  $F$  is the field of integers modulo 11.
3. Show that  $x^2 + 1$  is irreducible over the integers modulo 7
4. State and prove Lagrange's theorem on group.