

## ALGEBRAIC STRUCTURES

### SEMESTER B-PROBLEM SET 1

1. Consider the set

$$\mathbb{Z}[\sqrt{5}] = \{a + b\sqrt{5} \mid a, b \in \mathbb{Z}\}.$$

(1) Show that  $\mathbb{Z}[\sqrt{5}]$  is a subring of  $\mathbb{C}$ .

(2) Is  $\mathbb{Z}[\sqrt{5}]$  also a subfield of  $\mathbb{C}$ ?