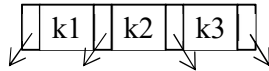


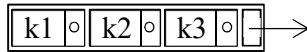
CS3402 Practice 9:

1. **Answer:**

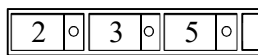
- When the number of key value in internal nodes is 3, a full internal node of this B+ tree will look like:



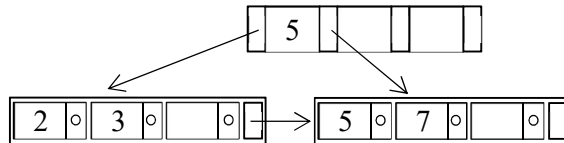
- When the number of key value in leaf nodes is 3, a full leaf node of this B+ tree will look like:



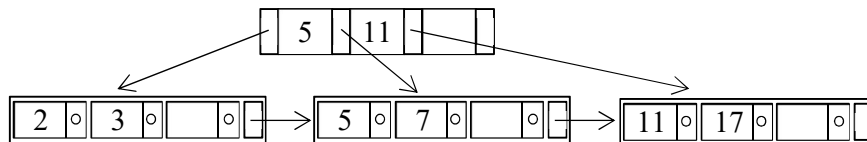
- After inserting 2, 3, 5, the tree looks like



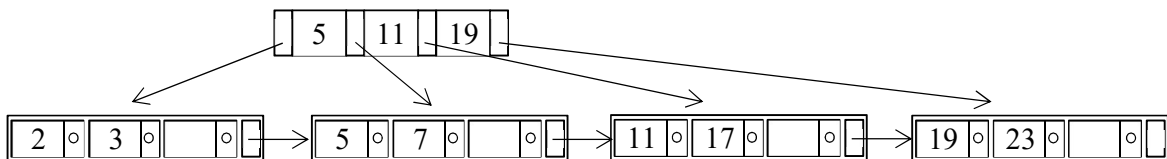
- After inserting 7, the tree looks like



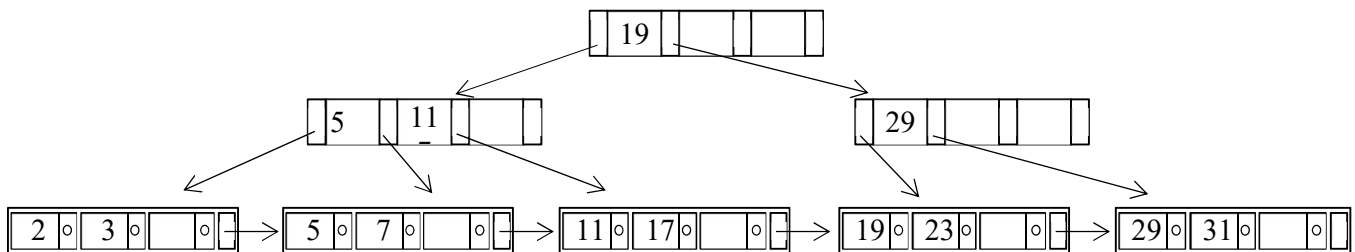
- After inserting 11, 17, the tree looks like



- After inserting 19, 23, the tree looks like

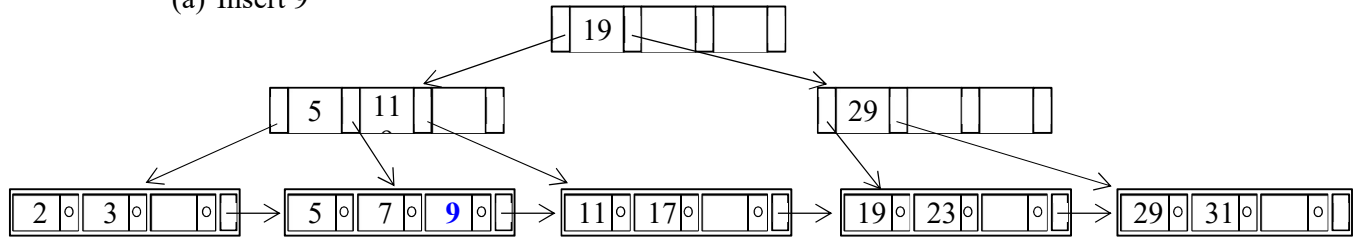


- After inserting 29, 31, the tree looks like

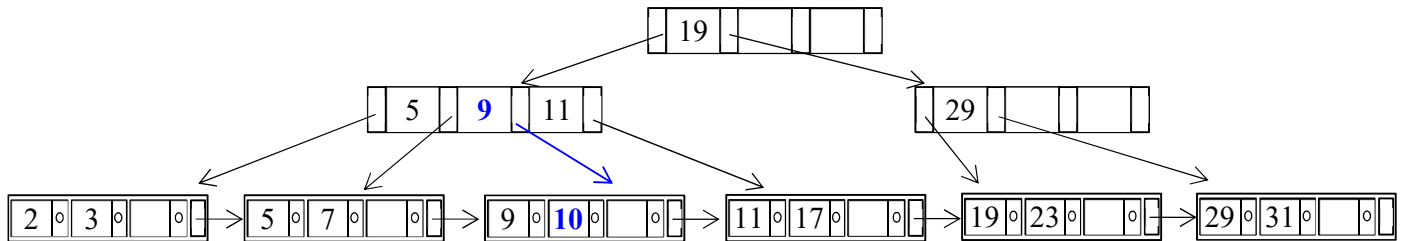


2. **Answer:**

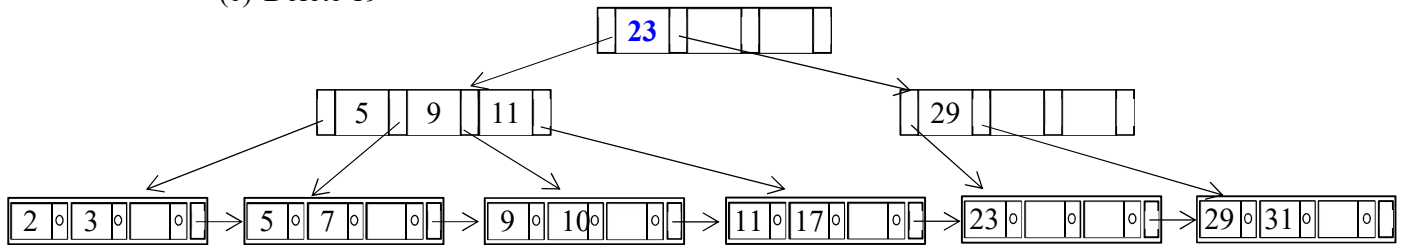
(a) Insert 9



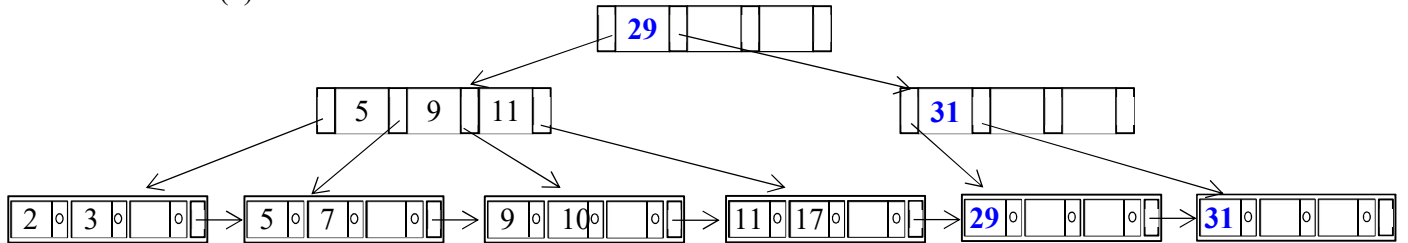
(b) Insert 10



(c) Delete 19



(d) Delete 23



(e) Delete 31

