1. Total entries (records) = 50,000, Number of entry/index per page = 30. The highest nodes fits one block means that the root node should have less than or equal to 30 indices. From bottom to root in B+ tree, the number of nodes in each level are:
   LEVEL 3: Leaf Nodes for data entries \( \lceil \frac{50000}{30} \rceil = 1667 \)
   LEVEL 2: Leaf Nodes for data entries \( \lceil \frac{1667}{30} \rceil = 56 \)
   LEVEL 1: Leaf Nodes for data entries \( \lceil \frac{56}{30} \rceil = 2 \)
   LEVEL 0: Root node = 1
   No. Of Levels = 4, Height of the tree = 3

2. (a) Refer the diagram below.
(b) No. Even though the entries are added in a different order eventually they’ll land in the same buckets.

(c) The resulting hash index is depicted below.

3. The resulting B+ tree is shown in the following figure.
4. (a) Before and after inserting 25 is depicted in following two figures respectively.

(b) Before and after deleting 25(with redistribution) is depicted in following two figures respectively.
(c) Before and after deleting 25 (with merging) is depicted in following two figures respectively.
(d) ISAM structures before and after inserting values 4 and 5 are shown here.
5. Refer the diagram below.
6. The command `CREATE INDEX` is used to create an index. The basic format of this command is `CREATE INDEX index_name ON table_name (field/s).