

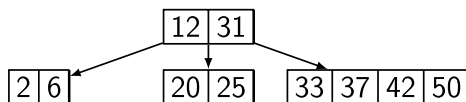
1. What is the minimum number of keys that can be stored in a B-Tree of order 32 and height 8?

- A. $2^{30} - 1$
- B. **[Correct Answer]** None of the other options is correct.
- C. $2^{30} + 1$
- D. **[Your Answer]** $2^{30} - 1$
- E. $2^{30} + 1$

2. What is the maximum number of keys that can be stored in a B-Tree of order 16 and height 4?

- A. **[Your Answer]** $4 \times 2^{16} - 1$
- B. $16 \times (4^{16} - 1)$
- C. **[Correct Answer]** $16^5 - 1$
- D. $16 \times (16^4 - 1)$
- E. None of the other options are correct

3. Consider this B-Tree:



How many disk seeks are required during the execution of `Find(42)`? Assume that none of the data exists in memory when the call is made.

- A. 4
- B. 1
- C. **[Correct Answer]** 2
- D. **[Your Answer]** 5
- E. The number of disk seeks cannot be determined because we do not know the order of the tree.

4. Which of the following statements is true for a B-tree of order m containing n items?

- (i) The height of the B-tree is $O(\log_m n)$ and this bounds the total number of disk seeks in a search for a key.
- (ii) A node contains a maximum of $m - 1$ keys, and this bounds the number of disk seeks at each level of the tree in a search for a key.
- (iii) An order 2 B-tree is also a Binary Search Tree.

Make one of the following choices.

- A. **[Correct Answer]** **[Your Answer]** Only item (i) is true.
- B. All choices (i), (ii), and (iii) are true.
- C. Only item (ii) is true.
- D. **[Correct Answer]** Two of the other choices are true.
- E. Only item (iii) is true.