

The University of New South Wales

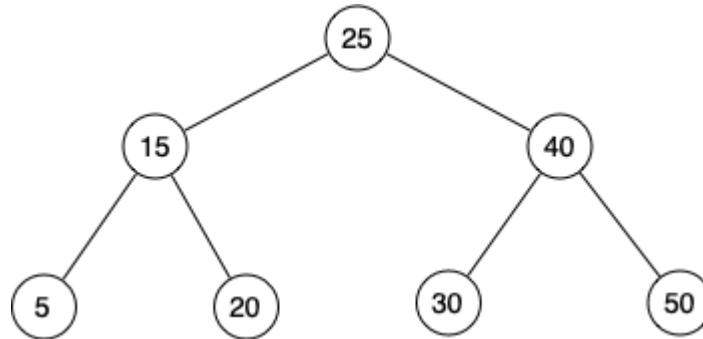
COMP2521 Data Structures & Algorithms

Final Exam

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[\[Q1\]](#) [\[Q2\]](#) [\[Q3\]](#) **[\[Q4\]](#)** [\[Q5\]](#) [\[Q6\]](#) [\[Q7\]](#) [\[Q8\]](#)

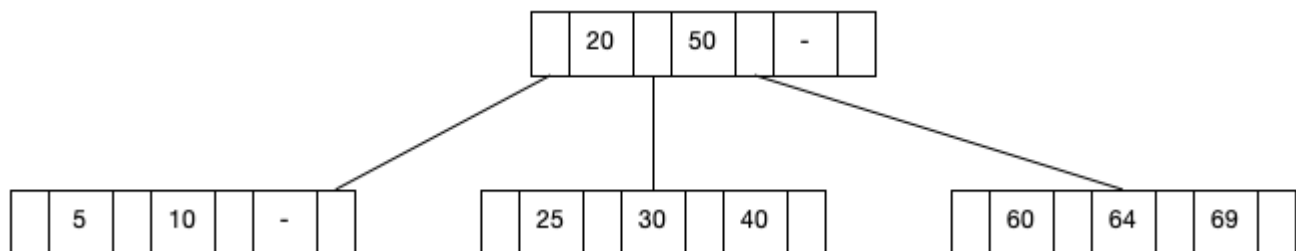
Question 4 (6 marks)

Consider the following binary search tree with 7 nodes:



- What is the height of the tree?
(Height = number of *edges* in longest path from root to leaf)
- What is the maximum height of a binary search tree with 7 nodes?
- If 26 was inserted into the tree, using simple BST insertion, what node would it be a child of?
Would it be a left child or right child?
- Give an insertion order for the values in the tree that could have produced this perfectly balanced tree.

Now consider the the following 2-3-4 tree:



- What is the maximum number of values that could be stored in a 2-3-4 tree of this height?
- After the value 42 was inserted into this 2-3-4 tree, what values would be in the root node?

Instructions:

- Type your answer to this question into the file called `q4.txt`
- Submit via: **give cs2521 exam_q4 q4.txt**
or via: Webcms3 > exams > Final Exam > Submit Q4 > Make Submission

End of Question