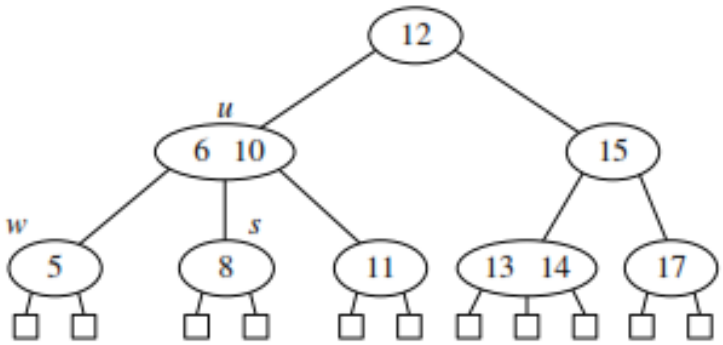
CS 201 – Data Structures II (L2), Spring 2024
Quiz # 6

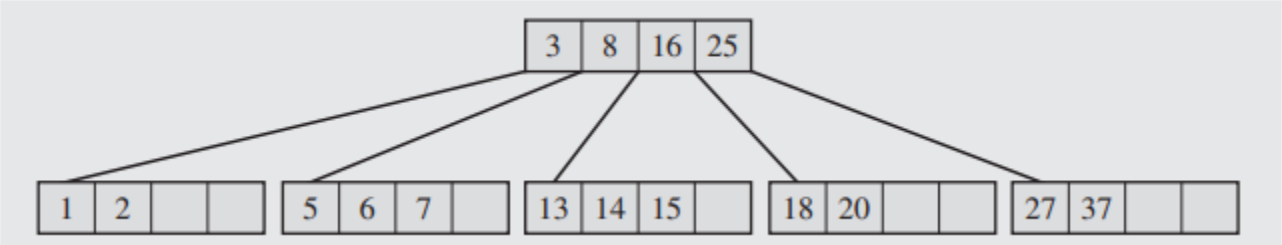
Name: _____ ID: _____

Q1 – [2 points] **Delete 12** from the 2-3-4 tree given below (using the in-order predecessor i.e. the rightmost/max key in the left sub-tree):



Mention if there is any underflow, and if so at which node(s). Which operator did you apply to fix this condition?

Q 2 - [5 points] Consider the following B-tree of **order 5:**



Insert the keys **10, 11 and 12** into this B-tree. Show the final B-tree after insertions. Also, state whether an overflow or an underflow has occurred, and if so at which node(s). Which operators dis you apply to fix this condition?

Note: The split operation, in case of even number of keys, will use the right key (form the middle) to split the node.

Q 3 – [3 points] Consider the following 2-3-4 tree:

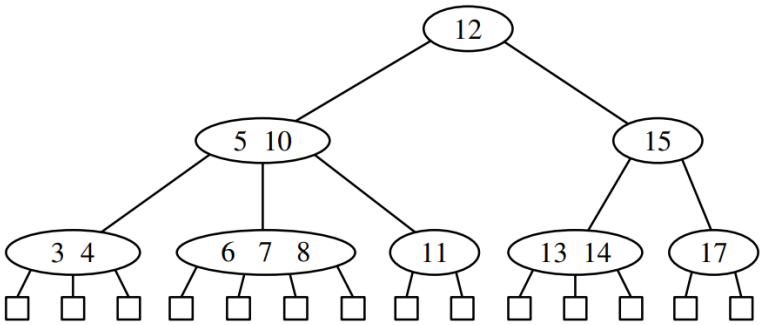


Figure 11.24: A $(2,4)$ tree.

Can this tree be **compacted** (i.e.) can you construct another 2-4-tree which has a reduced height but the same values of keys? If yes, then draw the **compacted** tree.