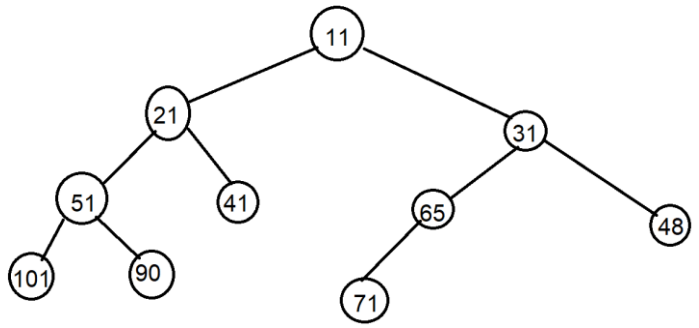
2) (10 pts) ALG (Heaps)

(a) (3 pts) A heap is represented by the array below. The first item is stored at index 1. Answer the following questions (**please answer the data not the index where it's stored.)**

index	1	2	3	4	5	6	7	8	9	10
data	7	11	13	16	18	19	24	21	20	35

i). Who is the left child of 13: _____, ii). Right child of 16: _____iii) parent of 24:_____

(b) (2 pts) Consider the following tree. Is this a valid minheap? Justify your answer. *Just saying yes/no has no credit without justification.*



(c) (5 pts) Consider a **minheap** stored in an integer array *int heaparray[100]*, which is globally declared. Complete the percolateUp function below that takes an index and perform the full percolate up operation for the item at that index. While writing the code, you can assume that there is a swap function available for you that is described below.

```
// swap(int* ptrA, int* ptrB) – swaps the contents in the variables
//                              pointed to by ptrA and ptrB.
void percolateUp(int idx){


    if ( ________ > 1) {

        if ( ____________________________________________________ ) {

            swap( _____________________________ , _____________________________ )

            percolateUp( _________________ );
        }
    }
}
```