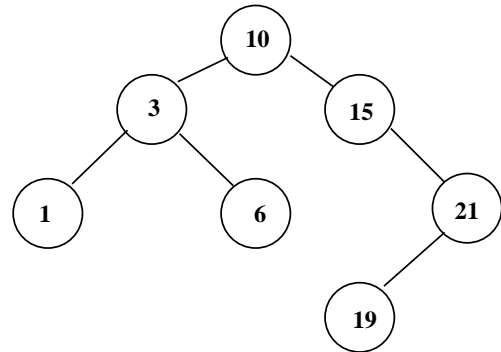**Name:**   **Student Number:**

1. [**6 marks:**] Suppose you design a hash table of size 63 (i.e. $m == 63$). You decide to use open addressing, planning to resolve conflicts by linear probing with stepsize 14 (i.e. $C == 14$).

   (a) What's wrong with the design of this hash table? What symptom of the problem do you expect?

   14 and 63 are non comprime. A probing sequence could return to the home index without exploring every location.

   (b) Which of the following would be a better choice of stepsize: 27, 28, 32? Explain your choice.

   32, because gcd(32,63) $== 1$ — 32 and 63 are coprime.

   (c) State a better choice of table size that is slightly larger than 63 but will eliminate problems with step size. Explain your choice.

   67 is prime, so it is comprime with any stepsize in [1,66].

2. [**6 marks:**] Using the procedure from the online notes

   (a) Splay the tree given below on the node with key value 1. Show your work.

   (b) Splay the tree given below on the node with key value 19. Show your work.

[End of quiz]