

CIS 3223 Short Quiz 5

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Name: solns

Temple ID (last 4 digits: _____)

1 If a forest consists of 7 trees with each tree having 11 nodes, how many edges does the forest have?

each tree has 10 edges

$$7 \times 10 = 70$$

70

2 Let $B = (V, E)$ be a full binary tree with 21 leaves, what is $|V|$?

$$|V| = n, \quad |E| = 2n - 1$$



$$2 \times 21 - 1 = 41$$

3 leaves, 5 nodes

41

3 Implementing Kruskal's algorithm on a connected graph with n nodes using union by rank what is the largest rank that can be assigned to a node?

$$2^{\text{rank}} \leq n$$

$$\text{rank} \leq \log_2 n$$

$$\text{rank} \leq \lfloor \log_2 n \rfloor$$

$\lfloor \log_2 n \rfloor$

4 For a 5-ary heap, what is the parent for node number j ?



$$\lfloor \frac{j-1}{5} \rfloor = 1 \quad 1 \quad 1 \quad 1 \quad 1$$

$\lfloor \frac{j-1}{5} \rfloor$