Discrete Mathematics
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Final Exam
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1. Represent the following algebraic expression as a labeled binary tree

   [{ (A * B * C * D^2 * F) ^ 3 } / (H / J) ^ 4] ^ 5

2. True or False. If false please correct it and give the true statement.

   A) A binary relation is called an equivalence relation if it is anti-reflexive, symmetric, and not transitive
   B) (p -> q) -> p is a tautology
   C) If a proposition is not a tautology then it is called a contradiction
   D) If A = {1,2} then the power set is P(A) = {{1}, {2}}
   E) 16 mod 5 = 5

3. Prove by induction for all n >= 0

   $1 + 5 + 25 + 125 + ... + 5^n = \{5^{(n+1)} - 1\} / 4$

4. Traverse the following labeled tree in the following order
   A) in-order
   B) post-order

   root=A, R={(A,B), (A,E), (B,C), (B,D), (D,F), (E,H), (E,K), (H,I)}

5. Find an Euler path/circuit from this graph if possible.

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     /-----A-----B----\
    /      | \ / |     \
   C----------D---------E
    \      | / \ |     /
     \------F-----G----/
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