CS182 **Solution Key to Sample Final Exam**

Question 1. 0; $p \cdot q$

Question 2. 11

Question 3. The characteristic equation is $r^2 = 6r - 9$ which has a double root at $r = 3$, so the solution is of the form $a_n = c_1 3^n + c_2 n 3^n$ where c_1 and c_2 are constants that depend on the boundary conditions.

Question 4. v is ancestor of w if $Preorder[v] < Preorder[w]$ and $Postorder[v] > Postorder[w]$

Question 5. F, F, T.

Question 6. 50-8 = 42

Question 7. $C(2n+4, n)$, which is same as $C(2n+4, n+4)$

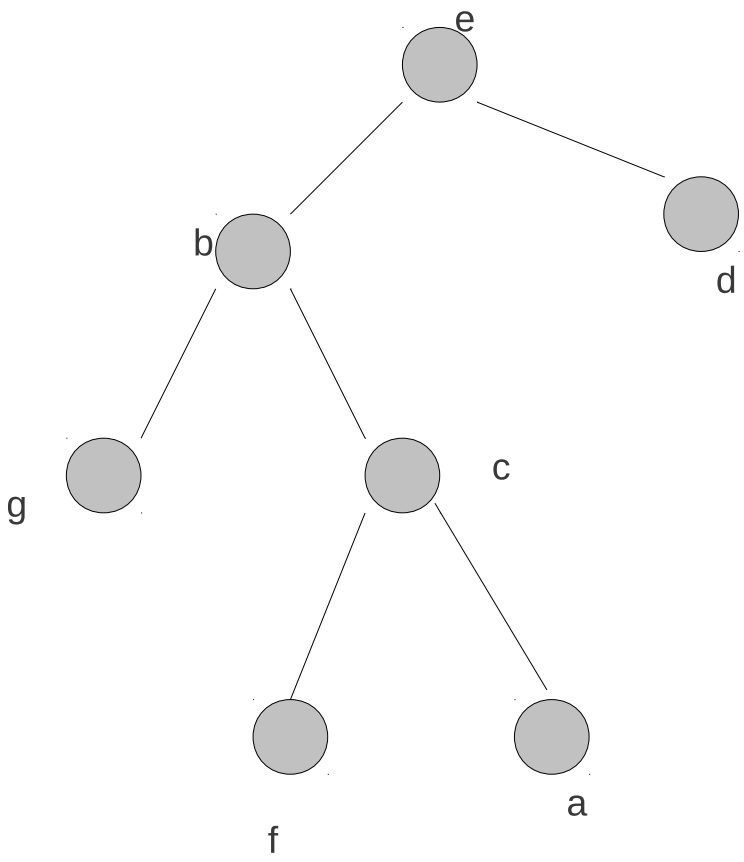
Question 8. $2^{-2n}C(n,m)C(n,n-m)$

Question 9. 0

Question 10. See Figure on next page. Postorder: $g\ f\ a\ c\ b\ d\ e$

Question 11. Code 3; Code 4, 2.18; the code $a = 1110,\ b = 0,\ c = 110,\ d = 1111,\ e = 10$ of average length 2.15

Question 12. Contains two consecutive zeroes; contains exactly two zeroes; contains an even number of 1s and ends with two 0s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