1.

After following the tree, the answer is D

2.

Since the years played is less than 5, the log salary is 5.11

The question asks for the actual salary, which is $e^{5.11} = 166$

The answer is D

3.

$\text{Auto } 1 = 8.146$

$\text{Auto } 2 = 8.028$

$\text{Auto } 3 = 7.771$

Order is LCA(3)<LCA(2)<LCA(1)

The answer is E

4.

$$\text{T1}(\text{Z} \leq 3, \text{Y} = \text{A}, \text{B}) = \frac{4.75 + 4.53 + 3.89}{3} = 4.39$$

$$\text{T2} = \frac{4.67 + 4.56 + 3.91}{3} = 4.38$$

$$\text{T3} = \frac{4.67 + 3.9}{2} = 4.29$$

$\text{T4} = 3.9$

The answer is A

5.

$\text{x} = 0.9$

$\text{y} = 0.8$

$\text{z} = 1.25$

The order is Y<X<Z

The answer is C

6.

$$\text{Gini Index (1)} = \frac{2\left(20\left(\frac{12}{20}\right)\left(\frac{8}{20}\right) + 80\left(\frac{18}{80}\right)\left(\frac{62}{80}\right)\right)}{100} = 0.375$$

$$\text{Gini index (2)} = \frac{2\left(10\left(\frac{8}{10}\right)\left(\frac{2}{10}\right) + 90\left(\frac{22}{90}\right)\left(\frac{68}{90}\right)\right)}{100} = 0.3644$$

Split 2 is preferred for gini index

$$\text{Entropy (1)} = \frac{20}{100}\left[-\frac{8}{20}\ln\left(\frac{8}{20}\right) - \frac{12}{20}\ln\left(\frac{12}{20}\right)\right] + \frac{80}{100}\left[-\frac{18}{80}\ln\left(\frac{18}{80}\right) - \frac{62}{80}\left(\ln\left(\frac{62}{80}\right)\right]\right] = 0.5611$$

$$\text{Entropy (2)} = \frac{10}{100}\left[-\frac{2}{10}\ln\left(\frac{2}{10}\right) - \frac{8}{10}\ln\left(\frac{8}{10}\right)\right] + \frac{90}{100}\left[-\frac{22}{90}\ln\left(\frac{22}{90}\right) - \frac{68}{90}\ln\left(\frac{68}{90}\right)\right] = 0.5506$$

Split 2 is preferred for entropy

For classification error, split 1 as 8+18=26 errors, while split 2 has 2+22=24 errors, so split 2 is preferred.

The answer is E, as split 2 is always preferred.

7.

Picture 1 Is the only one constructed using only vertical and horizontal lines.

The answer is A.

8.

Decision trees are easier to understand, are displayed graphically, and are easier to explain the linear regression methods.

The answer is E, as all three are true

9.

The answer is B, as the splits made match up with what the decision tree represents.