Level 1:

Entropy(Risk)=-(6/14\*log(6/14) + 3/14\*log(3/14) + 5/14\*log(5/14))=.46

**Entropy(Credit)**

Entropy(Bad)=-(3/4\*log(3/4) + 1/4\*log(1/4) )=.24

Entropy(Good)=-(3/5\*log(3/5) + 1/5\*log(1/5) + 1/5\*log(1/5)) =.41

Entropy(Unknown)=-(2/5\*log(2/5) + 2/5\*log(2/5) + 1/5\*log(1/5)) =.45

**Information Gain (Credit) =**

.46-(.24+.41.+45)=-.64

Similarly:

**Information Gain (Debt)=** .46-(x+y+z)=p

**Information Gain (Coll.)=** .46-(x+y+z)=q

**Information Gain (Income)=** .46-(x+y+z)=r

**The greatest among -.64, p ,q, r**  would be the root node.

Nested level 2:

Entropy(Risk)=-(3/4\*log(3/4) + 1/4\*log(1/4) )=m

Entropy(Credit)=-(3/4\*log(3/4) + 1/4\*log(1/4) )=w1

Entropy(Debt)=-(3/4\*log(3/4) + 1/4\*log(1/4) )=x1

Entropy(Coll.)=-(3/4\*log(3/4) + 1/4\*log(1/4) )=y1

Entropy(Income)=-(3/4\*log(3/4) + 1/4\*log(1/4) )=z1

**Information Gain (Credit) =** m-w1