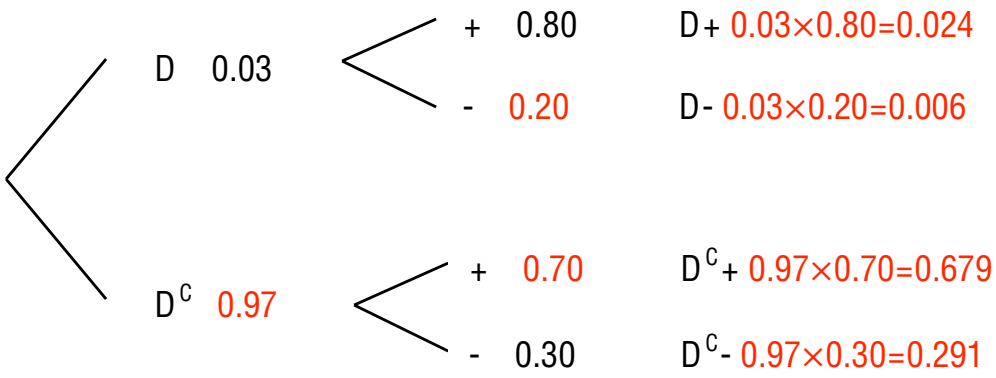
STT200-Lecture3 Recitation Quiz 1-26-10 Name Answer Key

Please circle the answers on the bubble sheet PID _____

Choose the closest answer you get.

Use the following tree diagram to answer questions 1 and 2. A person is sampled at random from a population. Let D be the event that the person has a particular disease. Let + be the event that the person tests positive for the disease. Suppose an applicable tree diagram is:



1. $P(D^C -)$=_____ $P(D^C-)=P(D^C)\times P(-\,|_{if}\,D^C)=0.97\times 0.30=0.291$

   A. 0.30 B. 0.679 C. 0.006 D. 0.291 E. 0.97

2. $P(-)$=_____ $P(-)=P(D-)+P(D^C-)=0.006+0.291=0.297$

   A. 0.297 B. 0.20 C. 0.30 D. 0.703 E. 0.006

Use the following table to answer questions 3 and 4. A 1992 poll conducted by the University of Montana classified respondents by sex and political party as shown in the table.

	Democrat	Republican	Independent	TOTAL
Male	36	45	24	105
Female	48	33	16	97
TOTAL	84	78	40	202

Suppose we are going to sample one person from these respondents, each one of them having an equal chance to be selected.

3. P(male)=_____ P(male)= #of males/# of respondents =105/202=0.5198

   A. 0.4286 B. 0.5198 C. 0.4802 D. 0.6929 E. 0.3429

4. $P(\text{republican}\,|_{if}\,\text{female})$=_____

   A. 0.4231 B. 0.3861 C. 0.4802 D. 0.3402 E. 0.1395

$$P(\text{republican}\,|_{if}\,\text{female})=\frac{P(\text{republican and female})}{P(\text{female})}=\frac{33/202}{97/202}=\frac{33}{97}\approx 0.3402$$

Answer questions 5 and 6 based on the following information. A box has colored balls numbering 3R 2G 4Y. A ball is selected from the 9 with equal probability for all balls. Then a second ball is selected from the remaining balls with equal probability. This is termed "without replacement"

5. P(First ball is red and second ball is yellow)=P(R1Y2)=_____
   A. 0.1667 B. 0.3333 C. 0.4444 D. 0.1481 E. 0.0833

$$\mathbf{P(R1Y2) = P(R1) \times P(Y2|_{if}R1) = \frac{3}{9} \times \frac{4}{8} = \frac{1}{6} \approx 0.1667}$$

6. P(Second ball is yellow)=P(Y2)=_____
   A. 0.5 B. 0.3333 C. 04444 D. 0.4 E. 0.0833

$$\mathbf{P(Y2) = P(Y1^{C}Y2) + P(Y1Y2) = P(Y1^{C})P(Y2|_{if}Y1^{C}) + P(Y1)P(Y2|_{if}Y1)}$$

$$\mathbf{= \frac{5}{9} \times \frac{4}{8} + \frac{4}{9} \times \frac{3}{8} = \frac{4}{9} \approx 0.4444}$$