

Quiz 5 for Statistics 213
Probability and Decision Theory - Spring 2002
Material Covered: Sections 7.5 and 7.6 of Workbook and text
Friday, 29th March

This is a 15 minute quiz, worth 5% and marked out of 5 points. The total possible points awarded for each question is given in square brackets at the beginning of each question. Anything that can fit on one side of an $8\frac{1}{2}$ by 11 inch piece of paper may be used as a reference during this quiz. A calculator and appropriate statistical tables may also be used. No other aids are permitted.

Name (please print): _____ . ID Number: _____
last first

The registrar's office releases the following information concerning the majors of sophomores at Purdue University North Central.

	% of sophomores in this major	% of females	% of males
Liberal Arts	0.55	0.75	0.25
Education	0.25	0.85	0.15
Technology	0.10	0.25	0.75
Sciences	0.05	0.50	0.50
Other	0.05	0.65	0.35

- (a) [1 point] The chance an education student is selected at random is (circle closest one) **0.05 / 0.10 / 0.15 / 0.20 / 0.25**.
- (b) [1 point] Given that an education student is selected at random, the chance this student is a female is (circle closest one) **0.55 / 0.65 / 0.75 / 0.85 / 0.90**.
- (c) [1 point] The probability a student, selected at random, is a female is (circle closest one) **0.60 / 0.65 / 0.71 / 0.75 / 0.79**.
- (d) [1 point] **True / False** An education student, event E , is independent of whether or not this student is a female, event F , because $P(F) \neq P(E|F)$.
- (e) [1 point] Given that a female is selected at random, the chance this student is majoring in education is (circle closest one) **0.25 / 0.30 / 0.35 / 0.40 / 0.45**.

(a) $F(E) = 0.25$

(b) $P(F|E) = 0.85$

(c) **0.71**

$$\begin{aligned} P(F) &= P(F|LA)P(LA) + P(F|E)P(E) + P(F|T)P(T) + P(F|S)P(S) + P(F|O)P(O) \\ &= (0.75)(0.55) + (0.85)(0.25) + (0.25)(0.10) + (0.50)(0.05) + (0.65)(0.05) = \end{aligned}$$

(d) **False** because $P(F) \neq P(F|E)$, *not* $P(F) \neq P(E|F)$.

(e) **0.30**

$$P(T|F) = P(F|T)P(T)/P(F) = (0.85)(0.25)/(0.7075)$$