

**Quiz 7 (Group) for Statistics 113**  
**Statistics and Society—Fall 2000**  
**Material Covered: Chapter 27 of Workbook and text**  
**For: Wednesday, 29th November**

Name 1 (please print): \_\_\_\_\_  
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Name 2 (please print): \_\_\_\_\_  
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Name 3 (please print): \_\_\_\_\_  
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Name 4 (please print): \_\_\_\_\_  
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Try the following questions.

1. [1] The SE for the percentage of heads among 500 tosses is 2.2 percentage points. The SE for the percentage of *tails* among 500 tosses is 2.2 percentage points. Thus, the SE for the difference

percentage of heads – percentage of tails

is (circle closest one) **0** / **2.2** / **3.1** / **4.4** / **5.7** percentage points.

2. In two independent SRSs of 1600 young males and 1600 young females, 7% of the males were illiterate, whereas only 3% of the females were illiterate. Is the difference real or the result of a chance variation?

(a) [1] To answer this question, we need to perform a (circle one) **one-sample** / **two-sample** *z*-test.

(b) [1] The statement of the test of hypotheses is given by (circle one):

- (i)  $H_o$  : expected proportion difference  $< 0$  versus  $H_a$  : expected proportion difference  $> 0$
- (ii)  $H_o$  : expected proportion difference = 3 versus  $H_a$  : expected proportion difference = 7
- (iii)  $H_o$  : expected proportion difference = 0 versus  $H_a$  : expected proportion difference  $\neq 0$
- (iv)  $H_o$  : expected proportion difference  $\leq 0$  versus  $H_a$  : expected proportion difference  $> 0$
- (v)  $H_o$  : expected proportion difference = 0 versus  $H_a$  : expected proportion difference  $> 0$

(c) [1] The value of the test statistic is  
(circle closest one) **0** / **2.2** / **3.1** / **4.4** / **5.7** percentage points.

(d) [1] Since  $P$  is so very very small, the result is (circle none, one or more)

- (i) significant.
- (ii) highly significant.
- (iii) not significant.
- (iv) due to chance variation.
- (v) real.

1. [1] **3.1.** ( $\sqrt{2.2^2 + 2.2^2} \approx 3.1$ )

2. In

(a) [1] **two-sample**

(b) [1] (v)

(c) [1] **5.7** (F:  $\sqrt{0.07(0.93)} \approx 0.255$ ,  $\frac{\sqrt{1600 \times 0.255}}{1600} \approx 0.00637$ ; M:  $\sqrt{0.03(0.97)} \approx 0.171$ ,  $\frac{\sqrt{1600 \times 0.171}}{1600} \approx 0.00426$   $\sqrt{0.00637^2 + 0.00426^2} \approx 0.00766$ ,  $\frac{0.07 - 0.03}{0.00766} \approx 5.27$ )

(d) [1] (ii), (v)