

STAT 3332 Statistics for Life Sciences

Fall 2006

Quiz 4

Your Name (Please **PRINT CLEARLY**):

Your *Signature*:

1. Suppose that a random sample of size $n = 5$ from a distribution F is

8 20 21 27 42

For the null hypothesis H_0 : “median of $F = 18$ ”, the *sign test statistic* S is (encircle best answer)

- (A) $-10 + 2 + 3 + 9 + 24 = 31$
- * (B) $0 + 1 + 1 + 1 + 1 = 4$
- (C) $-8 + 20 + 21 + 27 + 42 = 102$
- (D) $0 + 1 + 2 + 3 + 5 = 11$
- (E) $8 + 20 + 21 + 27 + 42 - 18 = 100$

2. (Continuation) The *Wilcoxon signed rank test statistic* W^+ for this H_0 is (choose from the answers listed in Question 1)

- (A)
- (B)
- (C)
- * (D)
- (E)

3. Suppose that independent random samples from two distributions F and G are

From F : 8 20 21 27 42

From G : 0 19 26 28 60 61

For testing $H_0 : F = G$, the *Wilcoxon rank sum test statistic* W is (encircle best answer)

- (A) $8 + 20 + 21 + 27 + 42 = 118$
- * (B) $2 + 4 + 5 + 7 + 9 = 27$
- (C) $1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11 = \frac{11 \times 12}{2} = 66$

4. Consider *categorical data* in the 3×2 contingency table (with row totals, column totals, and the grand total shown in **bold**)

19	14	9	42
5	10	6	21
24	24	15	63

For the (1, 1) cell with *observed count* $O_{11} = 19$, the *expected count* is $E_{11} =$ (encircle best answer)

- 19
- $\frac{24+42}{63}$
- $\frac{24-42}{63}$
- 63
- * $\frac{24 \times 42}{63}$

5. (Continuation) For testing homogeneity or independence, the test statistic $\sum_{cells} (O_{ij} - E_{ij})^2 / E_{ij}$ has approximate distribution *chi square* with degrees of freedom (encircle)

- 6 - 1 = 5
- * $(3 - 1) \times (2 - 1) = 2$
- 0
- 6
- 63