Questions 19 to 24 are based on material covered in *Chapter 9*.

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### Question 19

Ordered observations in a random sample from a population are given by $y_{(1)} = 19.0$, $y_{(2)} = 20.5$, $y_{(3)} = 20.7$, $y_{(4)} = 62.1$, $y_{(5)} = 77.0$. Other considerations make it reasonable to propose that an exponential distribution may be adequate to model the underlying variation in the population, and this proposition is put to the test using a probability plot. To achieve the plot, $x$-coordinates $x_1$, $x_2$, $x_3$, $x_4$, $x_5$ are required. Choose from the following options the values of $x_4$ and $x_5$. (Choose two options.)

2/3 5/6

$\frac{x}{3} = 1 - e^{-\lambda x}$

*Options*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **A** | 1.253 | **B** | 1.946 | **C** | 0.6931 | **D** | 0.9163 |
| **E** | 1.792 | **F** | 1.099 | **G** | 1.609 | **H** | 0.5108 |

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### Question 20

In a test of consumer preferences, a tally is kept of daily visits to an automatic cash dispenser in a small town (Monday–Sunday). The counts in one week's experiment were 391, 412, 410, 420, 401, 431, 370. Calculate the value of the chi-squared statistic in a test of the hypothesis that no day of the week is preferred over any other for a visit to the dispenser.

LESA Uniform dist

*Options*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **A** | 5.956 | **B** | 6.136 | **C** | 2412 | **D** | 405 |
| **E** | 35.47 | **F** | 0.0147 | **G** | 2835 | **H** | 37.65 |

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### Question 21

*Question 20, continued.* Give the number of degrees of freedom and the $SP$ for the test. (Choose two options.)

*Options*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **A** | 5 | **B** | 6 | **C** | 7 | **D** | 8 |
| **E** | 0.04 | **F** | 0.54 | **G** | 0.31 | **H** | 0.43 |

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### Question 22

Sixteen people who wished to lose weight started a diet plan at the same time. It was claimed that following the plan would lead to a loss of 5 kg in two months. After two months on the diet, the reported weight losses (in kg) were 4, 6, 3, 1, 2, 5, 4, 0, 3, 6, 3, 1, 7, 2, 5, 6 (an average weight loss of just over 3.6 kg). Find the value of the Wilcoxon test statistic $W_+$ and the corresponding $SP$ in an exact test that the claim is exaggerated. (Choose two options.)

*Options*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **A** | 24.5 | **B** | 0.0114 | **C** | 0.0174 | **D** | 0.0228 |
| **E** | 16.5 | **F** | 108.5 | **G** | 0.0348 | **H** | 0.0108 |

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$W_+ = 111$

-1 1 -2 -4 -3 0 -1 -5 -2 1 -2 -4 2 -3 0 1

1 2

-1 1 -1 1 1, -2 -2 -2 2, -3 -3, -4 -4, -5 7.5 10.5 12.5 14

1 1 1 2

-1 -1 -2