

FULL NAME: _____

DATE: January 6th, 2026 _____

GROUP NUMBER: _____

TIME: 2 hours

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ACTIVITY ONE (6 points)

- Tick (✓) the correct answer:

The role of inferential statistics is:

- Calculating the probability value alpha
- Calculating the effect size
- Summarizing the data of a sample
- Making predictions about a sample (1 pts)

Which of the following variables cannot be validly analyzed using a mean?

- IELTS score
- Gender (1 pts)
- Reaction time in milliseconds
- Number of pronunciation errors

In the dataset (15, 21,4, 24, 7, 23, 24), the median is:

- 7
- 21 (1 pts)
- 7 and 24
- 18

If σ is 1.35, the population variance is:

- 0.67
- 1.16
- 1.82 (1 pts)
- 2.70

A Type I error occurs when a researcher:

- Rejects a true null hypothesis (1 pts)
- Accepts a true null hypothesis
- Rejects a false null hypothesis
- Accepts a false null hypothesis

Which situation requires a non-parametric test?

- Ratio data with random sampling
- Ordinal data with non-normal distribution (1 pts)
- Interval data with homogeneous variances
- Large sample size ($n > 100$)

ACTIVITY TWO (6 points)

- Complete the table with the corresponding data type and the appropriate test for each scenario:

	Data type	Shapiro–Wilk (p)	Levene’s Test (p)	Inferential test
Years of English exposure are correlated with listening scores of a stratified random sample of university students.	Ratio data (1 pts)	.021	.048	Spearman’s rank-order correlation (1 pts)
Students’ grammar scores collected from three intact classes selected randomly.	Ratio data (1 pts)	.012	.020	Kruskal–Wallis test (1 pts)
Pronunciation accuracy scores collected before and after training from the same randomly selected learners.	Ratio data (1 pts)	.040	.036	Wilcoxon signed-rank test (1 pts)

Turn the page ...

ACTIVITY THREE (8 points)

- Use the table and formula below to **calculate** and **interpret** the effect size d :

	n	Mean	Standard Deviation
Group 1	5	37.40	12.58
Group 2	5	44.60	9.79

Cohen's d :

$$d = \frac{\bar{x}_1 - \bar{x}_2}{SD_{Pooled}}$$

Where:

$$SD_{Pooled} = \sqrt{\frac{(n_1 - 1)SD_1^2 + (n_2 - 1)SD_2^2}{n_1 + n_2 - 2}}$$

Report full calculations:

Step 1: Calculate the pooled standard deviation (1 pts)

$$SD_1^2 = 12.58^2 \approx 158.26$$

$$SD_2^2 = 9.79^2 \approx 95.84$$

Multiply by degrees of freedom (1 pts)

$$(n_1 - 1) \times SD_1^2 = (5 - 1) \times 158.26 = 4 \times 158.26 \approx 633.04$$

$$(n_2 - 1) \times SD_2^2 = (5 - 1) \times 95.84 = 4 \times 95.84 \approx 383.36$$

Sum and divide (2 pts)

$$\frac{(633.04 + 383.36)}{(n_1 + n_2 - 2)} = \frac{1016.40}{8} \approx 127.05$$

Take the square root (1 pts)

$$SD_{pooled} = \sqrt{127.05} \approx 11.27$$

Step 2: Calculate Cohen's d (2 pts)

$$d = \frac{(37.40 - 44.60)}{11.27}$$

$$d = \frac{-7.20}{11.27}$$

$$\approx -0.64$$

Interpretation (1 pts)

Based on the d value, the effects size is: **medium**

BEST OF LUCK!