

1st EXAM IN STATISTICS Answers Key

Exercise 1 (7.5 pts): Determine whether the following statements are true (T) or false (F) and correct the false statements.

N°	Statements	T/F
1	<i>Discrete variables</i> can only take specific, distinct measures with ascendant infinite values between them. Conversely, <i>continuous variables</i> can assume any value within an interval, and there are pre-determined limited possibilities between any two values.	F
	<i>Discrete variables can only take specific, distinct values with clear gaps between them. Conversely, continuous variables can assume any value within an interval, and there are infinite possibilities between any two values.</i>	1.5
2	<i>Ordinal numbers</i> express order or ranking and are used to calculate the central tendency of any set of data.	F
	<i>Ordinal numbers express order or ranking and cannot undergo these mathematical operations.</i>	1.5
3	Ordinal data reflect relative positions. They lack precise quantifiability and the intervals between their categories are not uniform.	T
	1.5
4	When collecting secondary data, researchers observe and record behaviours, actions, or events in their natural settings.	F
	<i>When collecting primary data, researchers observe and record behaviours, actions, or events in their natural settings.</i>	1.5
5	Parametric data refers to data that follows a distribution-free pattern, usually the normal distribution.	F
	<i>Parametric data refers to data that follows a specific probability distribution, usually the normal distribution</i>	1.5

Exercise 2 (6 pts): Indicate what test is most suitable for the following research questions.

RQ1: Does the distribution of preferred language skills (speaking, listening, reading, writing) vary among students majoring in English language education and those majoring in English literature within a TEFL program? **1.5**

- | | |
|-----------------------------------|---------------------------------------|
| a- <i>t</i> -test | c- Wilcoxon signed-rank test |
| b- Chi-square for goodness of fit | d- Chi-square homogeneity test |

RQ2: Are there significant relationships between the frequency of extracurricular language practice (e.g., language exchange programs, conversation clubs) and the motivation levels (e.g., intrinsic, extrinsic) of TEFL students? **1.5**

- | | |
|---|---|
| a- ANOVA | c- Kruskal- Wallis test |
| b- Chi-square test of independence | d- Pearson's coefficient of correlation |

RQ3: Do students who engage in language learning through immersive virtual reality environments demonstrate better results in a language proficiency test compared to those using traditional classroom methods? **1.5**

- a- Regression
- b- Mann-Whitney U test
- c- Brown and Smythe's test
- d- t-test**

RQ4: Do students from various cultural backgrounds – Asian, European, and Middle Eastern – differ significantly in their speaking proficiency test in a multicultural TEFL classroom? **1.5**

- a- ANOVA**
- b- Mann-Whitney U test
- c- Chi-square for goodness of fit test
- d- t-test

Exercise 3 (6.5 pts): Analyse the table below and answer the following questions. (Circle the letter corresponding to your answer.)

Gender * Activity level Crosstabulation

		Activity level		Total	
		Inactive	Active		
Gender	Male	Count	236	188	424
		% within Gender	55.7%	44.3%	100.0%
		% within Activity level	49.8%	46.3%	48.2%
		% of Total	26.8%	21.4%	48.2%
Female	Female	Count	238	218	456
		% within Gender	52.2%	47.8%	100.0%
		% within Activity level	50.2%	53.7%	51.8%
		% of Total	27.0%	24.8%	51.8%
Total	Total	Count	474	406	880
		% within Gender	53.9%	46.1%	100.0%
		% within Activity level	100.0%	100.0%	100.0%
		% of Total	53.9%	46.1%	100.0%

- 1- Provide an appropriate heading for the table (**write your answer inside the box**) (2)
- 2- For which statistical test the table has been generated? (2)
 - a- t-test
 - b- Chi-square**
 - c- ANOVA
- 3- What interpretation(s) would be most relevant to the displayed values? (2,5)
 - d- There is no significant association between gender and level of activity among the participants.**
 - e- Inactivity is significantly associated to males.
 - f- Males and females display similar levels of activity.**
 - g- There is a significant difference of activity between males and females
 - h- The level of activity is strongly associated to the participants' gender.