3.1 Research methods and the experimental study

Name: _____ Class: _____ Date: _____ **Total: 28 marks**

KEY WORDS independent variable • sign test

Research methods and the experimental study

Objective

Identify variables, designs and controls, compute descriptive statistics, apply the ethical framework, and structure the experimental-study report with an inferential decision at HL (approaches to researching behaviour plus the IA).

1 Key knowledge and worked examples

Methods toolkit. Experiments: lab, field, natural, quasi; independent, repeated, matched designs with counterbalancing. Sampling: random, opportunity, volunteer; sampling chooses who, ALLOCATION assigns conditions. Descriptive statistics: mean dragged by outliers, median resists, mode for categories; range vs SD. Correlation $r \in [-1, +1]$, never a cause. Qualitative: case studies, observations with inter-rater reliability, interviews, focus groups, questionnaires, triangulation. Ethics: consent, deception + debrief, protection, withdrawal, confidentiality, 3Rs. Evaluation: generalizability, credibility, bias. Sign test: $N = 8$, 2 negative signs $\rightarrow S = 2$ exceeds the critical value $\rightarrow$ not significant at 5%. IA: aim $\rightarrow$ exploration $\rightarrow$ analysis $\rightarrow$ evaluation $\rightarrow$ appendices.

2 Practice

2.1 In the rehearsal experiment, state the independent variable and the dependent variable, each operationalised. [2]

2.2 State one strength and one limitation of a repeated-measures design, naming the countermeasure for the limitation. [3]

2.3 Compare random sampling with opportunity sampling for a school study: one advantage and one disadvantage of each. [4]

2.4 In the rehearsal pilot, semantic-processing recall scores were 9, 8, 10, 7, 9 and 9. Calculate the mean and the median of the set, and state what the two condition means alone cannot show. [4]

2.5 State two ethical requirements the IA must satisfy before any data collection. [2]

3 Exam-style questions

3.1 *(IA design style.)* Design a simple experiment on the effect of background music on anagram solving: state the aim, the design with a reason, two controls and the ethical safeguards. [6]

3.2 *(HL statistics.)* Eight participants complete both conditions; six improve and two decline. Explain what the sign test would decide and why, stating N, S and the 5% level. [4]

3.3 *(Method choice.)* A researcher wants to understand why students avoid asking questions in class. Compare an anonymous questionnaire with semi-structured interviews, and recommend one, with a reason. [3]