

Research Methods Comprehensive Exam Guide

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The research methods comprehensive exam is designed to provide you the opportunity to demonstrate your knowledge of research methods and your ability to apply them to pursue scientific questions. Listed below are examples of how questions may be presented. Also listed below are five content areas and within each, concepts you should know.

Question Form

- 1) Definitions (e.g. define and discuss research methodology terms)
- 2) Integration and Application:
 - Critique a research scenario in terms of appropriate use of research methods and interpretation of findings in the context of research questions posed
 - Design and justifying one or more aspects to a hypothetical research study in the context of a specific research question or problem,
 - Discuss implications and limitations of research methods in the scientific enterprise

Content Areas

- A. Theory and Philosophy of Science
 - Formulation of research question
 - Declaration of hypotheses
 - Theoretical framework and theories (development and application)
 - Deductive vs. Inductive processes
- B. Research Designs
 - Qualitative vs. Quantitative vs. Mixed designs
 - Cross-sectional vs. Longitudinal designs
 - Experimental vs. Quasi-experimental vs. Pre-experimental vs. Correlational designs
 - Specific quantitative designs
 - 1) Single-subject design
 - 2) Single group pre-post test design
 - 3) Posttest-only two group design
 - 4) Nonequivalent control group design
 - 5) Posttest-only control group design
 - 6) Pre-test/posttest single group design
 - 7) Pre-test/posttest control group design
 - Threats to internal validity (and ways to control for these using specific design)

C. Subject Selection

- Sampling designs
 - 1) Simple random sampling
 - 2) Systematic random sampling
 - 3) Stratified random sampling
 - 4) Non-probability sampling
 - 5) Cluster sampling

- Threats to external validity
 - 1) Sampling bias
 - 2) Ways to control for threats to external validity

D. Measurement

- Types of measurement
 - 1) Self-report
 - Self-administered questionnaire
 - Oral interview
 - 2) Behavioral
 - Observational
 - Physiological
 - Performance-based
 - 3) Archival
- Levels of quantitative measurement
- Reliability
 - 1) Test-retest
 - 2) Inter-rater
 - 3) Internal consistency
 - 4) Split half
- Validity
 - 1) Construct
 - 2) Content
 - 3) Criterion
 - 4) Face
 - 5) Convergent
 - 6) Discriminate
- Types of measurement biases and ways to reduce them

E. Data Analysis and Interpretation

- Descriptive vs. inferential
- Meaning of statistical significance
- Statistical vs. practical significance
- Interrelation of effect size, sample size, statistical power, alpha level