

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**Ph.D. COURSE WORK EXAMINATION – REGULAR – SUMMER 2023**

**Subject Code: PHD2201**

**Date: 02/07/2023**

**Subject Name: Research Methodology (Pharmacy & Biotechnology)**

**Time: 01:30 PM to 04:30 PM**

**Total Marks: 70**

**Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a)** Give answers of following questions related to parametric tests: **10**
- i) Define parametric tests and explain their assumptions.
  - ii) Discuss the applications and appropriate use of t-tests, including independent samples t-test and paired samples t-test.
  - iii) Explain the concept of analysis of variance (ANOVA) and its use in comparing means across multiple groups.
  - iv) Describe the assumptions and application of regression analysis in statistical testing.
- (b)** Outline the typical phases or stages involved in a research study, from the initial planning to the final reporting. Write briefly the purpose and activities involved in each phase of the research process. **10**
- Q.2 (a)** Discuss about research problem formulation: **10**
- i) Define the concept of research problem formulation and explain its importance in the research process.
  - ii) Discuss the key steps involved in formulating a research problem.
  - iii) What are the characteristics of a well-formulated research problem? Provide examples to support your answer.
  - iv) Explain the difference between a descriptive research problem and an explanatory research problem. Give examples of each.
- (b)** Define the concept of research objectives and their role in guiding a research study in pharmacy with suitable example. Discuss the key factors to consider when formulating research objectives in pharmacy. **10**

**Or**

- (a)** Write about statistical evaluation methods: **10**
- i) Explain the concept of statistical power and its importance in hypothesis testing.
  - ii) Discuss the use of effect size measures in evaluating the strength of statistical relationships.
  - iii) Describe the concept of p-value and its interpretation in hypothesis testing.
  - iv) Explain the concept of confidence intervals and their role in estimating population parameters.

- (b) Ms. Kher involved in research entitled 'Exploration of drug x in treatment of Alzheimer disease'. Help her in scheming research design including details of possible hypothesis and outline the content of her research report. 10
- Q.3** (a) Give the full form of a) GUJCOST b) DST c) CSIR d) AYUSH e) DRDO 05  
 (b) Define and explain the importance of citation. Explain the APA style. 05
- Q.4** (a) Explain the term h-index, i-10 index and g-index. Discuss the importance of the same. 05  
 (b) Discuss the various search engine tools used for literature survey. Write the use of library and electronic databases to carry out literature survey. 05
- Q.5** (a) HPLC method was developed by researcher, how he can check reliability and accuracy of his developed method and discuss the measures or approaches that researchers can undertake to ensure and enhance the reliability of their experiments. 05  
 (b) Explain the process of selecting an appropriate theoretical model or framework for a research study and how it can guide the research process. 05

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