

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
Ph.D. COURSE WORK EXAMINATION (REGULAR) – WINTER 2025

Subject Code: PHD2401

Date: 12/10/2025

Subject Name: Research Methodology_ Sciences

Time: 01.30 PM – 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)** What do you mean by research? Explain its significance in modern times. **10**
- (b)** Write short notes on: (i) Design of the research project; (ii) Criteria of good research. **10**
- Q.2 (a)** What is research problem? Define the main issues which should receive the attention of the researcher in formulating the research problem. Give suitable examples to elucidate your points. **10**
- (b)** “Research design in exploratory studies must be flexible but in descriptive studies, it must minimise bias and maximise reliability.” Discuss. **10**
- Or**
- (a)** Distinguish between the following: (i) Type I error and Type II error; (ii) the binomial and Poisson distribution. **10**
- (b)** The procedure of testing hypothesis requires a researcher to adopt several steps. Describe in brief all such steps. **10**
- Q.3 (a)** Enumerate the different methods of collecting data. **05**
- (b)** What is Chi-square test? Explain its significance in statistical analysis. **05**
- Q.4 (a)** State the basic assumptions of the analysis of variance. **05**
- (b)** Distinguish between primary data and secondary data. **05**
- Q.5 (a)** What is the role of visuals (tables, graphs, diagrams) in technical documents? **05**
- (b)** Distinguish between patent, copyright, and trademark. **05**
