WINTER-2024	
Exam Seat No.:	
Academic Year:2024-2025	Semester:I
Class:PG-I	Program:MCA
Branch Code:M.C.A.	Pattern:2024
Name of Course:Research Methodology	Course Code:2409507
Max. Marks:60	Duration:2.30 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper
and on the cover page of the Answer Book, which is provided for their use.

    1. This question paper contains TWO page(s).
    2. Answer to each new question is to be started on a new page.
    3. Assume suitable data wherever required, but justify it.
    4. Draw the neat labelled diagrams, wherever necessary.
    5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

                                                                            Marks CO

Question No. 1

1 a)   Describe the different steps involved in a research process. Distinguish between Research methods and   (6)   CO1
       Research methodology.

<div align="center">OR</div>

1b)   Write the different types of research, clearly pointing out the difference between an experiment and a   (6)   CO1
       survey.

1c)   Enumerate the different methods of collecting data. Which one is the most suitable for the research   (6)   CO1
       conducted by you? Explain its merits and demerits.

<div align="center">OR</div>

1d)   Give your understanding of a good research design. Is single research design suitable in all research studies?   (6)   CO1
       If not, why?

Question No. 2

2a)   In context to the research study/ title done by you, discuss in detail steps/ techniques involved in   (6)   CO2
       defining the research problem.

<div align="center">OR</div>

2b)   Why is probability sampling generally preferred in comparison to non-probability sampling? Explain the   (6)   CO2
       procedure of selecting a simple random sample.

2c)   State the reasons why sampling is used in the context of research studies. Illustrate which sampling method   (6)   CO2
       is used in the research study conducted by you.

<div align="center">OR</div>

2d)   What the various tests used for hypothesis testing. Illustrate the test that has been used in the research   (6)   CO2
       study conducted by you.

Question No. 3

3a)   Discuss in detail the criteria for classification of mathematical models. Illustrate any one of the   (7)   CO3
       mathematical models.

3b) Illustrate the Predator-Prey model with suitable examples. (7) CO3

3c) Illustrate with suitable data the use of logistic regression to predict whether a student will pass or fail an exam based on the number of hours they studied. (5) CO3

OR

3d) Illustrate Modeling with Partial Differential Equations(PDEs). (5) CO3

Question No. 4

4a) Illustrate Process Optimization. What is the use of Steepest Ascent in process optimization? (7) CO4

OR

4b) Illustrate the use of Parameter Design for minimizing the impact of uncontrollable factors (noise) on the performance of a system. What is the use of Taguchi Approach for parameter design? (7) CO4

4c) Illustrate the key considerations in design of the process model. (5) CO4

OR

4d) Illustrate the following w.r.to the research study conducted by you, i) Input factors/variables, ii) Output parameters/ variables, iii) controllable/ uncontrollable variables, iv) dependent/independent variables (5) CO4

Question No. 5

5a) What is the significance of interpretation of research findings? Illustrate the techniques of interpretation. What precautions need to be taken for correct interpretation of the findings? (6) CO5

OR

5b) Illustrate the Layout of the Research report with the help of the research study conducted by you. (6) CO5

5c) Define Covariance? Discuss in detail the significance of Covariance. How is Covariance Analysis important for outcomes of research study? (6) CO5

OR

5d) Illustrate with suitable case study the general outline of a popular report. (6) CO5

····· **End of question paper**·····