MAT-303

June - Examination 2026
M.Sc. (Final) Examination
MATHEMATICS
Research Methods
Paper : MAT-303

[*Time: **3** Hours*] [*Maximum Marks: **80***]

Note :- The question paper is divided into three Sections A, B and C. Write answers as per the given instructions in each section. Use of non-programmable scientific calculator is allowed in this paper.

Section-A **8×2=16**

(Very Short Answer Type Questions)

Note :- Answer **all** questions. As per the nature of the question delimit your answer in one word, one sentence or maximum up to **30** words. Each question carries **2** marks.

1. (i) Define research and mention any two of its characteristics.
   (ii) Differentiate between basic research and applied research.
   (iii) Define an h-index.
   (iv) State any two characteristics of a good research problem.
   (v) What is primary purpose of a literature review?
   (vi) What do you mean by informed consent in research ethics?
   (vii) Define plagiarism.
   (viii) What is a null hypothesis?

Section-B **4×8=32**

(Short Answer Type Questions)

Note :- Answer **any four** questions. You have to delimit your each answer maximum up to **200** words. Each question carries **8** marks.

2. Explain the steps involved in the scientific method.
3. Compare quantitative and qualitative research with suitable examples.
4. Discuss APA, MLA and Chicago referencing styles. Highlight their major differences.
5. Explain various sources of research problems and the process of formulating a problem statement.

6. Describe the role of sampling techniques in quantitative research.

7. Explain reliability and validity of measurement tools with examples.

8. Discuss the ethical guidelines that should be followed while conducting research.

9. Explain the importance and stages of the peer-review process.

Section-C **2×16=32**

(Long Answer Type Questions)

Note :- Answer **any two** questions. You have to delimit your each answer maximum up to **500** words. Each question carries **16** marks.

10. Discuss the concept of research, its characteristics and the importance of objectivity, reliability, and validity in scientific investigation.

11. Explain the process of conducting a literature review. Discuss methods of searching, organizing, synthesizing, and critically analysing literature.

12. Describe the process of data handling in research. Explain the use of functions, formulas, pivot tables, and macros in data analysis.

13. Explain the role of Artificial Intelligence tools in research. Discuss the applications, advantages, limitations, and ethical concerns associated with tools such as ChatGPT, Copilot, Gemini, DeepSeek, and AI-driven statistical software.
