

QPCode

Reg.No :

Name :

MAHATMA GANDHI UNIVERSITY, KOTTAYAM
MGU-UGP (HONOURS) MODEL EXAMINATION October 2026

Fifth Semester

SIGNATURE COURSE - MG5SECPHYA00 - RESEARCH METHODOLOGY AND SCIENTIFIC TYPESETTING
(2024 ADMISSION ONWARDS)

Duration: 1 hour 30 minutes Hours

Maximum Marks: 50

*Remember(K), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C), Skill(S), Interest(I) and
Appreciation(Ap)*

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

Part A

MCQ with options

Answer all questions

Each question carries 1 mark

1. Which research approach primarily develops or tests ideas through mathematical or conceptual reasoning? [Understand] / [CO1]
 - A. Use of concepts, models and logical reasoning
 - B. Computational research
 - C. Theoretical research
 - D. Computational research
2. Basic research is primarily undertaken to [Understand] / [CO1]
 - A. Develop or test knowledge, theories and hypotheses
 - B. Basic research
 - C. Advancement of knowledge
 - D. Solve problems of immediate practical concern
3. What is the main role of computational research? [Remember] / [CO1]
 - A. Computational tool
 - B. Computational research
 - C. Algorithms and numerical calculations
 - D. Using computation to model, simulate or analyse problems
4. Research problems are often found by [Understand] / [CO1]
 - A. Reading literature and identifying gaps or unresolved issues
 - B. Generate new or unexpected findings
 - C. Lead to meaningful discoveries or understanding
 - D. Formally test or challenge the finding
5. The first step in identifying a research problem is often to [Remember] / [CO1]
 - A. Recognize an issue, gap or unanswered question
 - B. The chosen field of study
 - C. Clearly defined and researchable
 - D. Something important is not adequately known
6. Defining a research problem means [Remember] / [CO1]
 - A. Unclear and overly broad wording
 - B. Variables, context or population where appropriate
 - C. Specifying exactly what will be investigated
 - D. Delimiting the study population/context
7. A research question is primarily intended to [Understand] / [CO1]
 - A. Guide what the study seeks to answer
 - B. Clearly formulated research questions
 - C. A research question

D. How does temperature affect the resistance of a given material?

8. A hypothesis is best described as [Remember] / [CO1]
- A. A theory
 - B. Testable
 - C. A scientifically reasonable prediction
 - D. Reconsidered or revised
9. Research design is best described as [Understand] / [CO1]
- A. A factor that can take different values
 - B. The experimental condition being tested
 - C. The purpose of each step
 - D. The overall plan for conducting the study
10. Accuracy refers to [Remember] / [CO1]
- A. Unreliable or biased results
 - B. Closeness of a measurement to the true or accepted value
 - C. Bias experimental conclusions
 - D. Recorded carefully
11. Quantitative data are data that [Understand] / [CO2]
- A. Can be represented numerically
 - B. Secondary data
 - C. Qualitative data
 - D. Quantitative data
12. The main purpose of a literature review is to [Remember] / [CO2]
- A. Research gaps
 - B. Describe and evaluate literature relevant to a topic
 - C. An overview of the field of inquiry
 - D. The research problem or question
13. Which is an effective literature-search strategy? [Understand] / [CO2]
- A. Digital academic information
 - B. Use focused keywords related to the research question
 - C. Refining terms based on relevant results
 - D. Indian theses and dissertations
14. A literature review should contain [Remember] / [CO2]
- A. The basis for selecting the literature
 - B. Introduction, body and conclusion
 - C. Major agreements, disagreements and general conclusions
 - D. Principal questions asked in the field
15. The final year report begins with [Understand] / [CO2]
- A. The issue that needs investigation
 - B. What new value the research provides
 - C. The specific tasks needed to achieve the project goals
 - D. An abstract
16. The methodology section primarily explains [Remember] / [CO2]
- A. A project proposal
 - B. How the research was conducted
 - C. Project schedule and milestones
 - D. Resources and time needed for the work
17. The Results section should primarily [Understand] / [CO2]
- A. Present the findings of the study
 - B. Interpret findings in relation to the research question
 - C. Observations, data and the hypothesis
 - D. Words, tables and graphics
18. Interpretation of results asks [Remember] / [CO2]

- A. Bring together the main findings
 - B. What the findings mean in relation to the research question
 - C. The research question and evidence
 - D. Illustrate relevant findings
19. Research ethics concerns [Understand] / [CO2]
- A. Responsible conduct of research
 - B. Honest reporting of data and methods
 - C. The integrity and credibility of research
 - D. Submitting the same research work to more than one journal
20. Plagiarism involves [Remember] / [CO2]
- A. Restating meaning in your own words
 - B. Using another person's work or ideas without proper credit
 - C. An accurate reference
 - D. Identified as a quotation and cited
21. A direct quotation is [Understand] / [CO3]
- A. Understanding the original text
 - B. Where the borrowed information originated
 - C. An exact reproduction of spoken or written words
 - D. Sparingly and for a clear purpose
22. LaTeX is primarily a [Remember] / [CO3]
- A. High-quality typesetting
 - B. Document preparation system
 - C. Professional typesetting and mathematical support
 - D. Automatic numbering and referencing
23. A LaTeX document has two main parts: [Understand] / [CO3]
- A. `\documentclass`
 - B. Articles and reports
 - C. Letters
 - D. Preamble and document body
24. The command for bold text is [Remember] / [CO3]
- A. `\texttt{}`
 - B. `enumerate`
 - C. `\textit{}`
 - D. `\textbf{}`
25. The environment used to create tables is [Understand] / [CO3]
- A. `\hline`
 - B. `Columns`
 - C. `tabular`
 - D. Laboratory observations
26. The package required for including graphics is [Remember] / [CO4]
- A. `\caption{}`
 - B. `graphicx`
 - C. `\centering`
 - D. Describe the figure clearly
27. Automatic cross-referencing is useful for [Analyse] / [CO4]
- A. Sections, figures, tables and equations
 - B. Point to the intended element
 - C. Renumber items manually
 - D. Maintains consistency when content changes
28. BibTeX is mainly used for [Analyse] / [CO4]
- A. Sources cited or referenced in a document
 - B. Scientific writing
 - C. Bibliography management

D. Managing bibliographic entries

29. Which sequence best represents the essential structure of a scientific project report prepared using LaTeX?

[Apply] / [CO4]

- A. Title/abstract → introduction → methodology → results and discussion → conclusion/future work → references
- B. Title → CV → acknowledgements only
- C. Figures → bibliography → title only
- D. Tables → equations → references only

30. Which combination of LaTeX features is most useful for professional scientific documentation and CV preparation?

[Apply] / [CO4]

- A. Structured sections, tables, figures, equations, lists and consistent formatting
- B. Only manual page formatting
- C. Only image editing
- D. Only plain text without document structure

Part B

Essay Question

Answer the following question

Each question carries 20 marks

31. Prepare a scientific project report titled “Experimental Investigation of the Dependence of Resistance on Temperature” using LaTeX. Explain and demonstrate how you would prepare the report containing: (a) title page and abstract, (b) introduction and objectives, (c) literature review, (d) experimental methodology, (e) results and discussion, (f) tables containing experimental observations, (g) figures/graphs representing experimental results, (h) conclusion and future scope, and (i) references. Write suitable LaTeX commands/environments for creating the major elements of the report.

[Apply] / [CO3 / CO4]

***** End of Question Paper *****