Question Bank

Section A: Short Answer Questions

Q No. 1: Define the following terms with suitable examples:

a) Paradigm
b) Hypothesis
c) Exogenous and Endogenous Variables
d) Research Ethics

Q No. 2: Differentiate between Theoretical Research and Experimental Research.

Q No. 3: Explain the concept of plagiarism and suggest methods to prevent it in research.

Q No. 4: Write short notes on:

a) Types of Measurement Scales
b) SI Units in Research Documentation

Q No. 5: What are the essential elements of a good research paper abstract?

Q No. 6: Define the following with examples:

a) Originality in Research
b) Prescriptive Model
c) Research Problem vs Research Question
d) Peer Group Verification

Q No. 7: Distinguish between Descriptive and Inferential Statistics.

Q No. 8: Explain how unity and coherence contribute to good academic writing.

Q No. 9: Write short notes on:

a) Clustering and Classification in Data Analytics
b) Use of Graphs and Tables in Research Documentation

Q No. 10: What are the broad objectives of research? Explain with suitable examples.

Q No. 11: Differentiate between qualitative and quantitative research with examples.

Q No. 12: Explain the importance of literature review in a research project.

Q No. 12: What is the role of reliability and validity in research design?

Q No. 14: Discuss the ethical considerations in conducting surveys and interviews.

Q No. 15: How can bias affect research outcomes? Suggest ways to minimize it.

Section B: Medium Answer Questions

Q No. 16: Describe the structured and unstructured data types. How do they influence the choice of analytical tools?

Q No. 17: Explain the steps involved in hypothesis testing with a suitable example.

Q No. 18: Discuss the modes of inquiry and inquiring systems in research with illustrations.

Q No. 19: What are the characteristics of a good hypothesis?

Q No. 20: Explain different types of sampling techniques with suitable examples.

Q No. 21: Describe the differences between primary data and secondary data in research.

Q No. 22: What are the different types of research reports? Give examples.

Q No. 23: Explain the concept of research design and its types.

Q No. 24: Explain different types of research methodologies used in material and process design.

Q No. 25: What are the key criteria of good theory in research? Explain with examples.

Q No. 26: Describe the process of sampling and estimation in empirical research.

Section C: Long Answer Question

Q No. 27: You are designing a research study involving the development of a new material or process. Write a detailed note covering the following:
- a) Problem definition and objectives
- b) Selection of research methodology
- c) Data collection and analysis methods
- d) Model building and its classification
- e) Documentation format for publishing the findings

Q No. 28: Suppose you are conducting a theoretical study to build a model explaining a scientific phenomenon. Prepare a detailed report covering:
- a) Objective and scope
- b) Model boundaries and variable relationships
- c) Assumptions and limitations
- d) Theoretical framework and model classification
- e) Structure of the research report including citations and references

Q. No 29 Suppose you are developing a computational simulation to predict climate change impacts. Prepare a detailed report covering:
- a) Research objectives and study scope

b) Boundary conditions and interdependent variables
c) Assumptions, uncertainties, and model limitations
d) Theoretical basis and model typology
e) Recommended structure for research documentation with citations and references

Q. No 30. Imagine you are proposing a new economic model to explain consumer behavior during recessions. Prepare a detailed note covering:
a) Aim and research boundaries
b) Identification of variables and their relationships
c) Key assumptions and factors limiting model accuracy
d) Theoretical underpinnings and classification of the model
e) Format of the final research report including proper referencing

Q. No 31 You are working on a theoretical framework to model the spread of a viral infection. Prepare a comprehensive plan covering:
a) Study objectives and scope of research
b) Definition of model parameters and their interactions
c) Underlying assumptions and limitations of the model
d) Framework and classification of the modeling technique used
e) Outline of the research documentation structure, including citation practices

Q. No 32 Suppose you are designing a theoretical model explaining the dynamics of renewable energy integration in smart grids. Write a detailed note encompassing:
a) Research goals and the scope of the investigation
b) Identification and relationship of key variables
c) Stated assumptions and known limitations
d) Theoretical frameworks applied and model classification
e) Recommended structure for the final report with citation guidelines

Section A: Short Answer Questions (5 x 4 = 20 Marks)

Section B: Medium Answer Questions (3 x 6 = 18 Marks)

Section C: Long Answer Question (1 x 12 = 12 Marks)