Predicted Question Paper: Research Methodology

Subject Code: To be Assigned
Time: 3 Hours
Maximum Marks: 100
Instructions:

1.   Answer any **FIVE** questions.
2.   All questions carry **EQUAL marks** (10 marks each).

Q1. Foundations of Research

a) Discuss the objectives and importance of research. Explain how it is applied in modern scientific studies.
b) Differentiate between **empirical research** and **theoretical research**, with examples.

Q2. Hypothesis Testing

a) Explain the stepwise procedure for hypothesis testing with a neat flowchart.
b) A study assumes that 60% of the population prefers online learning. A random sample of 300 students shows that 180 prefer online learning. Test the null hypothesis at a 5% level of significance.

Q3. Research Design

a) Define research design. Discuss the key features of a **good research design** with examples.
b) Explain the **difference between exploratory and descriptive research designs**.

Q4. Measurement and Sampling

a) Discuss the problems associated with measurement in research. How do **validity** and **reliability** help solve these issues?
b) Describe the steps in **systematic sampling** and **stratified random sampling**, highlighting their differences.

Q5. Data Analysis

a) Explain the use of **Chi-square tests** in bivariate analysis. Provide an example to test the independence of two variables.
b) Create a **frequency table** and a corresponding **bar chart** for the following data:
Ages of respondents: [18, 20, 18, 22, 20, 21, 18, 22, 20, 21].

Q6. Research Ethics and Plagiarism

a) Define plagiarism. Discuss its consequences in academic research.
b) Write short notes on the following:
i) Ethical issues in publishing.
ii) Tools for detecting plagiarism.

Q7. Tools and Techniques for Research

a) Discuss the use of **reference management software** like Zotero and Mendeley in research.
b) Write the steps for formatting a research paper using **LaTeX** or **MS Word**.

Q8. Research Writing and Publishing

a) Outline the components of a well-structured **research paper**. Explain the significance of each section.
b) Explain how to select an appropriate journal for publication. Discuss **impact factors** and their importance.

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1. Answer any **FIVE** questions.
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Q1. Foundations of Research

a) Define research. Discuss the objectives, motivation, and utility of research in academic fields.
b) Explain the differences between **deductive theory** and **inductive theory** with examples.

Q2. Research Problem and Hypothesis

a) What are the qualities of a good hypothesis? Explain the importance of **null hypothesis** and **alternative hypothesis**.
b) A random sample of 500 students includes 140 who failed an exam. The hypothesis states that the failure rate is 25%. Test the hypothesis at a 5% significance level.

Q3. Research Design

a) Describe the **features of a good research design**.
b) Differentiate between **qualitative research** and **quantitative research**. Explain how these approaches can be combined.

Q4. Measurement and Scaling Techniques

a) What is measurement in research? Discuss the challenges of achieving validity and reliability in measurement.
b) Explain the **Nominal, Ordinal, Interval, and Ratio levels of measurement** with suitable examples.

Q5. Sampling Techniques

a) Explain the characteristics of a good sample. Compare **simple random sampling** with **stratified random sampling**.
b) A company wants to survey its employees. Design a sampling frame and justify the sampling method you would recommend.

Q6. Data Analysis and Hypothesis Testing

a) Explain the **Chi-square test for hypothesis testing** with an example.
b) Create a **pie chart** to represent the following data:
Departments: HR (25%), Finance (30%), IT (20%), Marketing (25%).

Q7. Research Ethics and Plagiarism

a) Discuss the importance of ethical practices in publishing research.
b) What are the consequences of plagiarism in academic research? List tools used for detecting plagiarism.

Q8. Tools and Techniques for Research

a) Explain the use of **reference management software** such as Zotero or Mendeley in organizing references.
b) Describe the process of formatting a research paper using **LaTeX** or **MS Word**.

Q9. Research Paper and Publishing

a) What are the components of a well-structured research paper? Explain each component briefly.
b) Discuss the factors to consider when selecting a journal for publication. What is the significance of a journal's **impact factor**?