



MALLA REDDY UNIVERSITY
SCHOOL OF ALLIED AND HEALTHCARE SCIENCES
M.SC I yr. II Sem RIT

Subject: Research Methodology & Biostatistics
Subject Code: MR25–2RIT204

Duration: 2 hours

Max. Marks:40M

Question Bank

S. No	Questions	Marks	Section	Unit
1	Define research methodology and explain its significance in scientific studies.	8	Section-I	1
2	What are the characteristics of good research? Illustrate with examples.	8	Section-I	1
3	Describe the techniques involved in defining a research problem.	8	Section-I	1
4	List and explain the various types of research, highlighting their unique features.	8	Section-I	1
5	What is a hypothesis? Discuss the difference between null and alternative hypotheses.	8	Section-I	1
6	a) Explain the objectives of research. b) Discuss the criteria that determine good research.	8	Section-I	1
7	a) Define descriptive research and explain its types with examples. b) How does analytical research differ from descriptive research?	8	Section-I	1
8	a) Outline the steps involved in writing research questions.	8	Section-I	1

	b) How does formulating a research problem contribute to the success of a study?			
9	a) Discuss the types of hypotheses with examples. b) Explain the procedure of hypothesis testing.	8	Section-I	1
10	a) Highlight the significance of research in clinical and life sciences. b) Explain the role of research in public health with examples.	8	Section-I	1
11	Define research design and explain the features of a good research design.	8	Section-II	2
12	Describe the types of informal experimental designs with examples.	8	Section-II	2
13	What are probability sampling techniques? Briefly explain stratified and clustered sampling.	8	Section-II	2
14	Explain the sources of errors in measurement and their impact on research outcomes.	8	Section-II	2
15	Discuss the importance of data quality and integrity in research, highlighting methods to ensure it.	8	Section-II	2
16	a) Differentiate between primary and secondary data with examples. b) Explain methods of collecting primary data using observation and interviews.	8	Section-II	2
17	a) Outline the steps involved in determining sample size for a research study. b) Discuss the advantages and limitations of simple random sampling.	8	Section-II	2
18	a) Define measurement and scaling techniques in research.	8	Section-II	2

	b) Explain the scale construction techniques: arbitrary and cumulative scales.			
19	a) What are formal experimental designs? Explain the completely randomized and Latin square designs. b) How does factorial design differ from other experimental designs?	8	Section-II	2
20	a) Discuss the factors influencing the selection of a suitable data collection method. b) Explain the process of checking errors in data and ensuring data reliability.	8	Section-II	2
21	Define statistics and differentiate between descriptive and inferential statistics.	8	Section-III	3
22	Explain the measures of central tendency and their appropriate applications in data analysis.	8	Section-III	3
23	What is the significance of skewness and kurtosis in the analysis of data symmetry?	8	Section-III	3
24	Define correlation and discuss the types of correlation with examples.	8	Section-III	3
25	Describe the properties of probability and explain the significance of probability distributions.	8	Section-III	3
26	a) Define variance, standard deviation, and interquartile range as measures of variability. b) Discuss the importance of variability measures in statistical analysis.	8	Section-III	3
27	a) What is a normal distribution? Explain its key properties.	8	Section-III	3

	b) Describe the process of calculating probabilities and percentage points from a normal distribution.			
28	a) Define regression and explain the concept of a simple linear regression. b) How are regression equations used for making predictions?	8	Section-III	3
29	a) Discuss the significance of the coefficient of correlation and its interpretation. b) Differentiate between Pearson's correlation and Kendall rank correlation coefficient.	8	Section-III	3
30	a) Explain the differences between normal, binomial, and Poisson distributions. b) Provide real-world examples where each distribution would be appropriately applied.	8	Section-III	3
31	What is the role of contingency tables in data analysis, and how are P-values derived from them?	8	Section-IV	4
32	Explain the difference between statistical significance and clinical/experimental significance.	8	Section-IV	4
33	Define hypothesis testing and describe its importance in statistical inference.	8	Section-IV	4
34	What is the Chi-square test, and how is it calculated?	8	Section-IV	4
35	Describe the purpose of one-way ANOVA and its applications in data analysis.	8	Section-IV	4

36	<p>a) Differentiate between the t-test for two independent means and the t-test for paired (matched) data.</p> <p>b) Provide examples of scenarios where each type of t-test is appropriate.</p>	8	Section-IV	4
37	<p>a) What is the z-test for two independent proportions?</p> <p>b) Explain how the z-test differs from the Chi-square test in hypothesis testing.</p>	8	Section-IV	4
38	<p>a) Describe the F-test and its use in statistical analysis.</p> <p>b) How does the F-test differ from the Wilcoxon two-sample signed rank test?</p>	8	Section-IV	4
39	<p>a) Explain the McNemar's test for paired proportions.</p> <p>b) Describe the Wilcoxon matched pairs test and its application.</p>	8	Section-IV	4
40	<p>a) What is two-way ANOVA, and how does it differ from one-way ANOVA?</p> <p>b) Explain the components of an ANOVA table and their significance in data analysis.</p>	8	Section-IV	4
41	<p>Explain the role of statistical software in data analysis and discuss the features of SPSS and SAS.</p>	8	Section-V	5
42	<p>Describe the various types of diagrammatic representations of data and their applications.</p>	8	Section-V	5
43	<p>What are the general rules of tabulation, and how are tables used to summarize data?</p>	8	Section-V	5
44	<p>Define a thesis and outline the steps involved in writing one.</p>	8	Section-V	5

45	Explain the significance of citation index, impact factor, and ISBN/ISSN in research reporting.	8	Section-V	5
46	a) Differentiate between bar diagrams and pie diagrams in data representation. b) Describe the importance of box diagrams and frequency polygons in graphical analysis.	8	Section-V	5
47	a) Discuss the structure of an original research report. b) Explain how abstracts and keywords are written effectively for research articles.	8	Section-V	5
48	a) What are plagiarism and its consequences in research? b) Explain the role of ethics committees in clinical and laboratory studies.	8	Section-V	5
49	a) Define intellectual property rights and discuss the significance of patents in research. b) Differentiate between copyrights and plagiarism in the context of academic integrity.	8	Section-V	5
50	a) What is a histogram, and how does it differ from a line diagram? b) Explain the components and uses of a periodic report in research documentation.	8	Section-V	5