MODEL QUESTION BANK FOR PhD ENTRANCE EXAMINATION – 2024-25

IN

PRINCIPLES OF BASIC RESEARCH METHODOL0GY

Q NO	QUESTIONS
1	A hospital has decided to make a study of stress due to work among its employees. There are 25 doctors, 150 nurses, 70 paramedics, 50 clerks and 80 unskilled workers employed there. Propose a sampling method which will fetch a good cross section of the hospital staff. Justify the reason for choosing the same.
2	Probability sampling methods are believed to be superior to non-probability sampling methods. Critically evaluate this statement and justify your position.
3	Sampling error may lead to poor quality of research. Illuminate the statement.
4	Differentiate between stratified sampling and cluster sampling.
5	Illustrate the merits and limitations of random and non-random sampling methods.
6	Enumerate different methods of data collection with brief note on observation method and interview method of data collection.
7	Explain in brief the questionnaire method of collection of data and give a short note on guiding considerations in questionnaire including validation
8	Explain differences between collection of data through questionnaires and schedules.
9	Enumerate different methods of data collection and explain in detail the case study method
10	Explain the various factors considered while selecting the appropriate method of data collection.
11	Importance of peer-review journals.
12	Role of editorial board in reviewing scientific paper.
13	CONSORT guidelines.
14	Importance of IMRaD in publication.
15	**a.** How to distinguish a popular literature from a scholarly journal **b.** Articles types.
16	**a.** Open access journals. **b.** Benefits of open access publishing.
17	**a.**Plagiarism. **b.**Fabrication.
18	**a.** Duplication. **b.** Conflict of interest
19	Publication process.
20	Reporting structure.
21	Explain the meaning and significance of a Research design

22	Explain the meaning of extraneous variables in context of Research design.
23	Explain the meaning of confounded relationship in context of Research design
24	Explain the meaning of research hypothesis in context of Research design
25	Explain the meaning of Experimental and Control groups in context of Research design
26	Explain the meaning of Treatments in context of Research design
27	Describe some of the important research designs used in experimental hypothesis testing research study
28	Explain and illustrate Two group simple randomized design
29	Explain and illustrate Latin square design
30	Explain and illustrate Random replications design
31	Explain and illustrate Simple factorial design
32	Explain and illustrate Informal experimental designs
33	Classify the quantitative research designs and discuss in detail the experimental design using suitable examples
34	Explain the Descriptive and Casual Studies designs
35	Define Research. List the characteristics of true experimental designs and explain the various experimental designs with examples.
36	Discuss Research design in case of exploratory research studies
37	Discuss Research design in case of descriptive and diagnostic research studies
38	Discuss Research design in case of hypothesis-testing research studies
39	Define Sample Design. Discuss consideration by a researcher in developing a sample design for this research project.
40	Differentiate between simple random sampling and complex random sampling designs
41	Explain why probability sampling is generally preferred in comparison to non-probability

	sampling
42	Explain the procedure of selecting a simple random sample.
43	Discuss the rationale for stratified random sampling design. Explain the procedure of selecting a stratified random sampling
44	Discuss the types of sampling using suitable examples
45	Describe the important causes responsible for systematic bias resulting from errors in the sampling procedures.
46	Discuss indications of probability and non-probability sample methods
47	Define randomized clinical trial. Explain the steps involved in RCT.
48	Discuss the salient features of Phase 1 and phase 2 clinical trials
49	Discuss the pros and cons of open labelled clinical trails
50	Explain double blind clinical trials with a suitable example.
51	Describe triple blind clinical trial using folic acid and placebo as an example
52	Explain the different pharmacological action studies in the drug development process
53	Discuss the Requirements to conduct clinical trials as per schedule Y
54	Design a randomized control trial to find the efficacy of tooth paste 'X' for dental caries.
55	With schematic representation, discuss integrated drug development process
56	Explain the importance of dosage form design in pre-clinical and clinical stages
57	Explain clinical trial protocol as per ICH-GCP guidelines
58	Discuss the guidelines and acts that govern the conduct of clinical trials in India
59	Illustrate the significance of non-therapeutic clinical trials
60	Discuss the factors that validate a clinical trial.
61	State the roles and responsibilities of a)investigator b) clinical research associate c) Regulatory authority as per ICH-GC

62	Illustrate the process of obtaining informed consent from the study subjects in a clinical trial
63	Explain the monitoring visits in initiation, conduction and closing of clinical trial
64	Briefly explain the measures of central tendency along with their advantages, disadvantages & suitable example.
65	a) Illustrate with an example, the application & uses of standard error of mean in large sample. b) Calculate standard deviation of the following series X- 20. 22, 28, 36, 42, 48, 54, 60
66	a) Explain the co-efficient of variation with an example. b) Explain the steps involved to calculate mean deviation.
67	Explain Chi square test and Wilcox on sum test in detail along with their significance.
68	Write the steps involved in testing procedures of hypothesis and write about null hypothesis.
69	Elaborate P value and value of significance.
70	Define Normal distribution. Write the characteristics of normal distribution and normal curve
71	Describe in detail the concept of Correlation and regression. Write interpretation and applicability
72	a) Define Variability and explain the measurements of variability b) What is the need of graphical representation of data in research study and explain the types of graphical representation
73	a) Write about confidence interval and its application to interpretation of result. b) Difference between parametric and non parametric tests
74	Choose and explain the test of significance for research involving more than two group and more than two observation in each group.
75	Importance of statistics in medical research.
76	Explain bio-statistics and write its application.
77	Define probability and write its laws and normal probability curve.
78	Explain the steps of dataprocessing in quantitative studies.
79	How do you process the research data in qualitative studies?
80	Explain the need for analysis of data. Add note on information on selecting the level of data.
81	Explain the process and importance of data editing and data coding.

82	Explain – Descriptive and Inferential statistical data analysis.
83	Discuss the considerations for parametric and non-parametric statistics.
84	Explain the basis for selection of a suitable statistical analytical test. Give examples.
85	Describe the impact of missing values and outliers in data analysis.
86	Explain the importance of statistics and computers in research.
87	Discuss the methods of presentation of analyzed data with examples.
88	Explain a typical algorithm defining types of clinical research.
89	a). Discuss the process of formulating a research problem with suitable example. b) Explain the concept of research design.
90	Explain how a clinical research study protocol is prepared.
91	Discuss the objectives and process of review of literature and its importance in research, Give examples of sources of literatures.
92	Explain Outcomes –driven research. Give examples.
93	Define and discuss – clinical and translational science research.
94	Explain the systematic process of literature search with databases and give examples of such literature databases.
95	Discuss how research design is proposed for an exploratory research study.
96	Describe research design for descriptive and diagnostic research studies.
97	Discuss the principles and types of experimental study designs
98	Define Research and research methodology. Explain the different steps involved in research process. (2+1+7)
99	Distinguish between Research methods and research methodology. (5+5)
100	Discuss the different ways of se1lecting the research problem? Explain the important criteria required to construct a research question? (5+5)
101	Explain the different types of research.(10)

102	Define hypothesis? Explain the importance of hypothesis. Discuss in detail different types of research hypothesis? (2+2+6)
103	Explain the tools of data collection. (10)
104	Define Sampling. Discuss probability and nonprobability sampling. (2+4+4)
105	Explain the methods of presentation of data. (10)
106	How to classify data. Discuss the methods of data collection. Describe the scales of measurement of data. (3+4+3)
107	Describe the elements of hypothesis. Explain Research hypothesis and null hypothesis with suitable examples. (2+4+4)
108	Explain the importance of conducting research in healthcare. (10)
109	Give a detailed account of Meta-analysis and step involved in conducting a meta-analysis
110	Explain case-control and cohort study designs with special emphasis on the outcome measures.
111	Explain interventional study designs with relevant examples
112	Give a detailed account of risk of bias assessment in randomized controlled trials.
113	Explain latin—square and cross over designs.
114	Give a detailed account of epidemiological methods in clinical studies.
115	What is fundamental research? Discuss the advantages and disadvantages.
116	Give an account on the various search engines for Literature survey.
117	Give a detailed account of nature of evidence and data interpretation (10).
118	Explain in detail the interpretation of cause-and-effect relationship (10).
119	Enumerate and explain in detail the components of report writing (10).
120	a. Briefly summarize the type of reports (5) b. Briefly explain the mechanics of writing a research report (5).
121	a. Briefly explain the precautionary measures to be undertaken while writing a research report (5). b. Enumerate the significance of report writing (5).
122	Briefly describe the four levels of measurement with examples (2.5+2.5+2.5+2.5)

123	Describe with examples the measures of central tendencies and dispersion for the four levels of measurement?
124	Explain reliability and its types with appropriate examples (1+3+3+3)
125	Explain the three main sources of random error during measurements. (4+3+3)
126	Explain any four strategies to increasing precision of measurement. (2.5+2.5+2.5+2.5)
127	Explain the difference between accuracy and validity of a measurement instrument with appropriate examples. (4+6)
128	Define validity and explain internal and external validity with examples. (2+4+4)
129	Summarize any five commons forms of validity (2+2+2+2+2)
130	Explain sensitivity and specificity of measurements (5+5)
131	What is a questionnaire? Briefly summarize the three phases in developing a new questionnaire. (1+3+3+3)
132	In survey instruments, compare and contrast Open-ended questions with Close-ended questions (5+5)
133	Describe the meaning and importance of internal consistency in scale development (5+5)
134	Describe the criteria in which Bioequivalence studies have become essential.
135	Describe the experimental protocol and analysis of data for bioequivalence studies
136	Explain the methodology for bioequivalence studies.
137	Explain the rationale for the logarithmic transformation of pharmacokinetic data in bioequivalence studies.
138	Explain the reasons for bioequivalence of drug formulation. Explain the statistical analysis of variances in bioequivalence studies
139	Describe the parameters considered while evaluating the rate of bioavailability. Explain the inclusion criteria while selecting the subjects

140	Describe the pharmacokinetic parameters described for single dose and multiple dose bioequivalence studies. Describe the crossover design in the bioequivalence studies
141	Define "Bioavailability" of a drug. Describe the various factors affecting bioavailability of a drug giving suitable examples.
142	Explain various methods for assessing bioavailability.
143	Explain the significance of Bioavailability studies and enumerate the criteria's for establishing bioequivalence requirement.
144	Discuss the importance of in-vitro, in-vivo correlation in the bioavailability studies.
145	First-pass metabolism after oral administration decreases bioavailability of certain drugs. Explain the mechanism by which this occurs.
146	Write importance of research methodology
	Write difference between pure research & applied research
145	Write a note on documentation involved in literary research
146	Limitations of animal experiments
147	Write about double blind procedure
148	Explain prospective & retrospective studies with examples
149	Difference between reference & bibliography
150	How to frame abstract? Contents of abstracts
151	Enlist the guidelines for writing a scientific papers
152	The role of placebo in the clinical research
153	Radio-isotopes and their role in medical research
154	Enlist the specific research instrument and write their uses
155	Importance of chromatographic studies
156	Explain thin layer chromatography
157	What are different methods of chromatography

158	Write importance of hypothesis
159	Write a note on assessment criteria with examples
160	Principles & methods of survey of medicinal plants
161	Physical conditions in animal house
162	Invitro studies- how do you carry out?
163	What is bioassay? What are the different investigations involved in it?
164	Fundamental research areas of Ayurveda
165	What is drug delivery system
166	Discuss about different bias in data collection
167	Give a brief note on informed consent
168	Discuss the principles of ethical content according to Belmont report
169	Give a brief account on phases of clinical trials
170	Brief note on chance variability
171	Categorize hypothesis with examples
172	Discuss the testing of hypothesis
173	What is the level of statistical significance, write importance of p value
174	Give a note on error
175	Write in detail cluster random sampling
176	Discuss bias in sampling
177	What is snowball sampling/chain sampling
178	Discuss the quantitative and qualitative variables
179	Explain the role of control group and reference standard group in an experimental study
180	Explain importance of aims and objectives in conducting research

181	Explain serendipty research
182	Describe the ethical principles involved in animal experimentation
183	Discuss the guidelines for acute and long term toxicity studies involved in pre- clinical testing
184	Give a detailed account of referencing systems
185	Write a protocol followed in writing thesis/dissertation
186	Give a brief note on manuscriptology and its importance
187	Describe the methods for drug identification involved in drug research
188	Enumerate the WHO guidelines for quality control of herbal drugs
189	Explain pharmacopial standards of drugs
190	Give a note on bio informatics
191	Write a note on TKDL
192	Explain type of variabilities
193	Define standard deviation write its uses
194	Explain in detail about analysis of variants
195	Give a detailed account of different tests under non parametric methods/tests
196	Give a note on statistical software
197	Explain different types of referencing