NATIONAL INSTITUTE OF PUBLIC HEALTH TRAINING AND RESEARCH, MUMBAI
Post Graduate Diploma in Hospital Management (PGDHM) Batch: 2024-25
First Semester Examination

PAPER–III

RESEARCH METHODOLOGY & INTRODUCTION TO STATISTICS

Date: 16.10.2024   Total Marks: 100
Time: 2:00 PM to 5:00 PM (03 Hours)   Credit: 4.0

Section: A) Research Methodology   Credit: 2.0 / Marks: 50

Q: 1)   **Descriptive Question**   **(Attempt any two)**   **20 Marks**

a)   What is sampling? Enumerate various sampling techniques. Describe systematic random sampling technique with example.

b)   What are the different types of instruments used for data collection?

c)   Describe briefly how will you conduct patient satisfaction survey in hospital setting?

Q: 2)   **Write in Brief**   **(Attempt any three)**   **15 Marks**

a)   Ethical issues in Health Research

b)   Records and Reports

c)   Qualitative Research Designs

d)   Patient Opinion Poll

e)   Cohort and Case-control Study

Q: 3)   **Short Notes**   **(Attempt any three)**   **15 Marks**

a)   Elements of a Research Protocol

b)   Descriptive studies

c)   Research Hypothesis

d)   Sources of errors in measurement

e)   Randomization in Research Studies

Section: B) Introduction to Statistics **Credit: 2.0 / Marks: 50**

Q: 1) **Descriptive Question** **(Attempt any two)** **20 Marks**

a) Define the differences between the null hypothesis and the alternative hypothesis, including their notations and explain the hypothesis testing procedure?

b) What are the various tests of significance? Differentiate between the parametric and non-parametric tests with examples.

c) Enumerate measures of central tendency. Compute the mean and standard deviation of the following frequency distribution:

Data-point (x)	4	8	11	17	20	24	32
Frequency (f)	3	5	9	5	4	3	1

Q: 2) **Write in Brief** **(Attempt any three)** **15 Marks**

a) Describe the applicability of 't' test with examples

b) Define type I and type II errors

c) Define sensitivity and specificity of a diagnostic test. Compute the values of specificity and sensitivity of a diagnostic test using the following contingency table:

	Disease: True	Disease: False
Test: Positive	85	5
Test: Negative	3	7

d) What is Bayes theorem? State various uses of Bayes theorem with examples.

e) Normal and Standard Normal Distributions

Q: 3) **Short Notes** **(Attempt any three)** **15 Marks**

a) Discrete and Continuous Probability Distribution

b) Odds Ratio vs Attributable Risk

c) Explain the Confidence Interval (CI) for the population mean of Normal distribution under assumptions and estimate the CI where sample of size 81 has sample mean 35 and population standard deviation 18. Construct a 90% confidence interval for the population mean using this information. Interpret its meaning. ($Z_{0.05} = 1.64$)

d) Find the given probabilities by showing the shaded region in standard normal distribution plot. (Note: Use graph and standard normal Z-table)
1) $P(Z < -0.85)$ 2) $P(Z > 1.50)$ 3) $P(Z < -1.20)$ 4) $(-0.5 < Z < -1.5)$

e) Chi-square test of independence

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