

MASTER OF PHYSIOTHERAPY
SECOND SEMESTER
RESEARCH METHODOLOGY &
BIO-STATISTICS-II

**SET
A**

MPT – 203

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs.

Full Marks: 70

(Objective)

Time: 30 min.

Marks: 20

Choose the correct answer from the following:

1×20=20

- Which one is the Characteristics of a Good Research Problem_
a. Clear and unambiguous
b. Relation between variables
c. Both of these
d. None of these
- How does research problem arise?
a. Exploratory
b. Research Gap
c. Predictive
d. None of these
- To ensure that research objectives are well-defined and achievable, one has to use the SMART criteria. The abbreviation of SMART is_
a. Specialized, Measurable, Achievable, Relevant, and Time-bound.
b. Specific, Manageable, Attainable, Reliable and Time-bound
c. Specific, Measurable, Achievable, Relevant, and Time-bound.
d. All of these
- Where does the word research come from?
a. Ancient Greek "recherche"
b. Ancient Egypt "recherche"
c. Middle French "recherche"
d. None of these
- Which of the following is a research objective
a. Exploratory
b. Evaluative
c. Predictive
d. All of these
- When to Write Research Objectives_
a. At the beginning of a research project
b. To get the idea of research project
c. At the end of the research project
d. None of these
- What is the purpose of a literature review?
a. To familiarize yourself with the current state of knowledge on your topic
b. To ensure that you're not just repeating what others have already done
c. Both of these
d. None of these

8. The reasons to conduct a **literature review** at the beginning of a research project:
 To familiarize yourself with the
 a. current state of knowledge on your topic
 To identify gaps in knowledge and
 c. unresolved problems that your research can address
 b. To ensure that you're not just repeating what others have already done
 d. All of these
9. Which is the Sources of Literature review_
 a. Primary Sources
 c. Tertiary sources
 b. Secondary Sources
 d. All of these
10. Null Hypothesis in Research Methodology is denoted by the symbol_
 a. H_a
 c. H_1
 b. H_0
 d. All of these
11. When a hypothesis has independent and dependent variables are more than two are known as_
 a. Complex hypothesis
 c. Empirical hypothesis
 b. Alternative hypothesis
 d. None of these
12. The source that index, abstract, organize, compile, or digest other sources in literature review is known as
 a. Original source
 c. Alternative sources
 b. Tertiary sources
 d. None of these
13. The t-test formula depends on_
 a. Only mean
 c. Both mean and variance
 b. Only Variance
 d. None of these
14. The critical value of t statistics is obtained from the t-table looking for_
 Degrees of freedom ($df = n-1$) and the
 a. corresponding α value (usually 0.05 or 0.01).
 c. Significance level and percentage
 b. Degrees of freedom and Percentile
 d. None of these
15. Test of Goodness of fit is conducted by using_
 a. Chi-square test
 c. F-test
 b. t-test
 d. None of these
16. If the number of rows is 3 and column is 4 for a test then degrees of freedom is__
 a. 12
 c. 3
 b. 6
 d. None of these
17. Professor R.A.Fisher was the first person who coined the term '___' and developed a very elaborate theory about the ANOVA,
 a. Mean
 c. Range
 b. Variance
 d. All of these
18. ___plays very important role when there are cases having several samples.
 a. t-test
 c. ANOVA test
 b. Z-test
 d. None of these

19. The F-ratio is expressed as_

a. $F = \frac{\text{Observed population var between samples}}{\text{Observed population var within sample}}$

F =

b. $\frac{\text{Estimate of population variance between samp}}{\text{Estimate of population variance within sampl}}$

F =

c. $\frac{\text{Observed population var between populations}}{\text{Observed population var within population}}$

d. All of these

20. Under one-way ANOVA, we consider only one factor

a. One factor

b. Two factors

c. More than two factors

d. None of these

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(Descriptive)

Time: 2 hrs 30 min

Marks: 50

[Answer question no.1 & any four (4) from the rest]

1. What do you mean by Research Problem? Discuss different sources of research Problem. 2+8=10

2. What do you mean by literature review? Discuss one source of literature review. 2+8=10

3. What do mean by Hypothesis in research. Why Hypothesis testing is used? Explain 3 different types of hypothesis 2+2+6
=10

4. a. Explain different steps in testing of hypothesis. 5+5=10

b. How do you conduct statistical analysis for the following hypothesis. Hypothesis- There is a correlation between a patient's adherence to prescribed physiotherapy exercises and their recovery from a sports-related injury.

5. What is the Application of t-test? A company wants to improve its sales. The previous sales data indicated that the average sale of 25 salesmen was \$50 per transaction. After training, the recent data showed an average sale of \$80 per transaction. If the standard deviation is \$15, find the t-score. Has the training provided improved the sales? (The tabulated t statistics for 24 df at 0.05 level of significance = 2.064) 2+8=10

6. a. What do you mean by categorical variable?

2+8=10

b. The following figures show the distribution of digits in number chosen at random from a telephonic directory:

Digits	0	1	2	3	4	5	6	7	8	9	Total
Frequency	1026	1107	997	966	1075	933	1107	972	964	853	10,000

Test whether the digits may be taken to occur equally frequently in the directory. (The tabulated Chi-square for 9 df at 0.05 level of significance is 16.919)

7. a. Discuss the importance of ANOVA test in research field.

3+7=10

b. Set up an analysis of variance for the following per acre production data for three varieties of wheat, each grown on 4 plots, and state if the variety differences are significant.

Per acre production data

Plot of Land	Variety of wheat		
	P	Q	R
A	5	3	4
B	4	4	3
C	3	4	5
D	6	6	2

(The tabulated F for (2,9) df at 0.05 level of significance =4.26)

8. Write short notes on: (Any two)

5+5=10

- Different sources of research problem.
- literature review vs academic research paper
- Independent t-test and Paired t-test
- One-Way ANOVA

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