



Seat No. \_\_\_\_\_

**HN-BP-801-T**  
**M. P. M. (Sem. VIII) (W.E.F. 2017)**  
**Examination**  
**April - 2023**  
**Biostatistics & Research Methodology -**  
**Theory : BP-801-T**

Time : 3 Hours / Total Marks : 75

- Instructions :**
- (1) Answer the following questions.
  - (2) Figure to the right indicate marks.
  - (3) Draw neat and clean diagrams as required.

**1** Answer the following questions : **10×2=20**

- (a) Define Research and give its importance.
- (b) Enlist the application of R Software in clinical trial.
- (c) Calculate the standard deviation of the following data: 2.21, 3.21, 1.54, 8.54, 5.54, 6.54, 4.21
- (d) What is SPSS?
- (e) Give the characteristic of MINITAB.
- (f) What do you mean by RCT? Explain its types.
- (g) Explain the various phases of clinical trial.
- (h) Classify different types of Probability Distribution.
- (i) Differentiate Non parametric and Parametric test.
- (j) Explain correlation.

**2** Answer any **two** out of the following : **2×10=20**

- (a) Explain in details about the sample size distribution and power of study along with the concept of hypothesis.
- (b) Write a brief note on ANOVA.
- (c) Write a brief note on various Optimization techniques for pharmaceutical formulations.

**3** Answer any **seven** out of the following : **7×5=35**

- (a) Explain in brief about the plagiarism.
- (b) Write a brief note on t- test.
- (c) Write a brief note on Research Protocol and its writing.
- (d) What is meant by regression modeling? Explain in detail about hypothesis testing in simple and multiple regression models.

- (e) Calculate the below data as per Friedman's Test and give your statement. 12 patients getting three different treatments. (FM Critical Value 6.17)

Treatment 1	Treatment 2	Treatment 3
20.9	88	109
412	388	142
315	451	155
389	325	121
210	126	75
136	118	49
178	227	101
228	98	49
240	205	142
113	88	45
178	194	55
321	349	121

- (f) Explain in detail about cohort study.  
 (g) Calculate :  
 (i) Mean by short cut method  
 (ii) Median from the following data recorded on a variety of wheat :

Number of spikes per panicle	Number of Branches
10-20	15
20-30	20
30-40	17
40-50	21
50-60	19
60-70	16
70-80	25
80-90	30
90-100	12

- (h) Explain the Concept of Blocking and confounding.  
 (i) Define response surface methodology. Explain in detail about central composite design.