REV-01 BPH/60/20/25

### B. PHARM. **EIGHT SEMESTER** BIOSTATISTICS & RESEARCH METHODOLOGY BP801T

2023/06

Full Marks: 75

Duration: 3 hrs.

[USE OMR SHEET FOR OBJECTIVE PART]

## ( PART-A: Objective )

Time: 30 min. Marks: 20

#### Choose the correct answer from the following:

 $1 \times 20 = 20$ 

- A random selection of sampling units from a population, is known
  - a. Non-probability sampling
- b. Probability sampling d. None of the above

- c. Mixed sampling
- In a Poisson distribution
  - a. the trials are independent and finite
- b. the trials are independent and
- c. the trials are dependent and finite
- d. the trials are dependent and infinite
- The rate of recovery of COVID-19 in a certain locality is 75%, the variance number of recoveries in a sample of 500 infected people in the locality is
  - a. 75
  - c. 9.68

- b. 375 d. 93.75
- A characteristic of a population is called
  - a. sample

b. Sampling

c. parameter

- d. None of the above
- Which of the following statement is true in case of multiple regression?
  - a. There is one dependent variable and two or more independent variables.
  - b. There is one independent variable and two or more dependent variables.
  - c. There is no restriction about the number of dependent and independent variables.
  - d. None of the above.
- If  $P(A^c) = 0.75$ , then P(A) = ?
  - a. 0.75

b. 0.50

c. 0.25

- d. 0.20
- Which of the following statement is true in case of two tailed test?
  - a. There is significant difference between true and a hypothetical value of a parameter
  - c. The true value of a parameter is greater than its hypothetical value.
- b. There is significant difference between true and a hypothetical value of a parameter
- d. The true value of a parameter is less than its hypothetical value.
- Which of the following tests is used in Analysis of variance?
  - a. To test the several population means
- b. To test the several population variances.

c. Both (a) and (b)

d. Neither (a) nor (b)

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<ul> <li>9. The coefficient of range of the following data: 36, 56, 38, 44, 24, 39, 51, 41, 45, 46, 3</li> <li>a. 0.40</li> <li>b. 4</li> <li>c. 0.18</li> <li>d. 2.5</li> </ul>	52
<ul> <li>In a dataset, if there are 4 mode, then it is called</li> <li>a. quadrimodal</li> <li>b. multimodal</li> <li>c. bimodal</li> <li>d. polymodal</li> </ul>	
<ol> <li>What is the harmonic mean for: 18, 12, 16, 21, 7, 9</li> <li>a. 11.9</li> <li>b. 9.1</li> <li>c. 1.3</li> <li>d. 12</li> </ol>	
<ul> <li>2. Correlation is a</li> <li>a. relationship between two variables.</li> <li>b. mathematical function expressing the average relationship between two variables.</li> <li>c. functional relationship between two variables.</li> <li>d. none of the above</li> </ul>	ables.
<ul> <li>3. Type-II error implies:.</li> <li>a. Not rejecting the null hypothesis when it is true</li> <li>b. Not rejecting the null hypothesis when it is not true.</li> <li>c. Rejecting the null hypothesis when it is true.</li> <li>d. Rejecting the null hypothesis which is not true.</li> </ul>	
<ul> <li>4. Which is related to frequency distribution?</li> <li>a. Variables</li> <li>b. Class interval</li> <li>c. Frequency</li> <li>d. All of the above</li> </ul>	
<ul> <li>5. If the range is high, then the depression is</li> <li>a. Low</li> <li>b. Equal</li> <li>c. High</li> <li>d. None of the above</li> </ul>	
<ul> <li>is used to compare the variability of two or more than two see</li> <li>a. Mean</li> <li>b. Coefficient of variation</li> <li>c. Standard Deviation</li> <li>d. Mean deviation</li> </ul>	ries
<ul> <li>7. A distribution in which mean, median and mode have different values, then it is called distribution.</li> <li>a. Symmetrical</li> <li>b. Skew</li> <li>c. Asymmetrical</li> <li>d. All of the above</li> </ul>	
8. The mode of the following series is 12, 3, 5, 3, 2, 4, 9, 8, 6, 5, 8, 11, 5, 9, 7, 5, 4, 6 a. 7 b. 3 c. 5 d. 6	
<ul> <li>9. A group distribution can be represented by</li> <li>a. Line plot</li> <li>b. Frequency curve</li> <li>c. Frequency plot</li> <li>d. Histogram</li> </ul>	
20. First step of an investigation is a. analysis of data b. collection of data c. presentation of data d. explanation of data	
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# PART-B: Descriptive

Time: 2 hrs. 30 min. Marks: 35 [Answer any seven (7) questions] What is research? Write a note on latin square design with proper 1+4=5 example? 2. Define research design, cluster randomization and variables? 3+2=5 Discuss about the types of variables with examples? Write a note on experimental design technique? 5 4. Calculate the mean by shortcut method of the following data? 2.5+2.5 Marks 40 48 52 58 64 69 74 78 scored No. of 2 8 5 3 2 1 Scholars Also, Calculate the geometric mean of the following daily income of workers: 700, 900, 800, 850, 750? 5. Write a note on measure of dispersion? 5 6. Write the expression of a binomial distribution with parameters n 5 and p. Mention its important assumptions. 7. If the heights of 500 students are normally distributed with mean 5 68.0 inches and standard deviation 3.0 inches, how many students have height between 65 and 71 inches. Given that the area of a normal curve in between z = -1 and Z = 1, is 0.6826. 8. Explain Type-I error and type-II error. Which error is more harmful 5 in Research? 9. 5 Distinguish between parametric test and non-parametric test.

# PART-C: Long type questions

### [Answer any two (2) questions]

- 1. The heights of the father and sons are given below Heights of father (in inches): 60 65 66 63 67 69 70
  - Heights of sons (in inches): 65 64 66 62 69 68 69
  - Estimate the height of son, whose father's height is 68 inches
- 2. The following data give the yield on 12 plots of land of three samples under the three varieties of fertilizers A, B and C.
- 10

- A: 25, 22, 24, 21, 20
- B: 17, 16, 16, 18
- C: 24, 26, 30

Test at 5% level of significance whether there is any significant difference in the average yields of land under three varieties of fertilizers. [Given, the critical value of the test statistic at 5% level of significance for (2, 9) df and (9, 2) df are respectively 4.26 and 19.38)

3. Calculate the coefficient of variation of the weight of pills: 5, 6, 8, 7, 5, 3, 4, 3, 6, 3.

The following data is of the number of patient visiting govt. hospital. Calculate mean and median?

No. of patient	1000	1500-	2000-	2500-	3000-
	-	2000	2500	3000	3500
	1500				
No. of Days	17	24	29	10	5

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