# BRAINWARE UNIVERSITY

**Term End Examination 2023**

**Programme – B.Pharm-2019**

**Course Name – Biostatistics and Research Methodology Theory**

**Course Code - BP801T**

**( Semester VIII )**

**Full Marks : 75** **Time : 3:0 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

## Group-A

(Multiple Choice Type Question) 1 x 20=20

1. *Choose the correct alternative from the following :*

(i) Reliability of a point estimation is measured by its _____. Select the correct option.

a) Standard deviation
b) Standard normal curve
c) Standard error
d) Coefficient of determination

(ii) Standard error of an estimator is a measure of _____. Select the correct option.

a) Population estimator
b) Precision of the estimator
c) Power of the estimator
d) Confidence interval of the estimator

(iii) Samples of size 25 are selected from a population with mean 40 and standard deviation 7.5. Compute the variance of the sampling distribution of sample means.

a) 7.5
b) 0.3
c) 0.03
d) None of these

(iv) Determine the degrees of freedom for the test statistic in one sample t-test.

a) 1
b) n
c) n-1
d) 0

(v) Select the distribution for which mean and variance are equal.

a) Binomial
b) Poisson
c) Normal
d) Exponential

(vi) When s.d. is known, the hypothesis about population mean is tested by_____. Choose the correct option.

a) t-test
b) Z-test
c) F-test
d) chi-square

(vii) The mean of the binomial distribution is_____. Select the correct option.

a) Less than the variance
b) Equal to the variance
c) Greater than the variance
d) None of these

(viii) Identify the mean of the Binomial distribution (10, 0.2)

a) 5
b) 12
c) 10
d) 2

(ix) Identify the variance of the Binomial distribution (12, 0.4)

a) 4.8
b) 2.88
c) 4
d) 2

(x) Sample regression function is the estimated version of the _____. Identify the correct option.

a) Estimated version of population regression function
b) Estimated version of population correlation function
c) Not an estimated version of population regression function
d) Both b and c

(xi) Maximum value in class limit is defined as

a) Lower limit
b) Upper boundary
c) Upper limit
d) Lower Boundary

(xii) Identify which of the following is not a measure of dispersion?

a) Variance
b) Standard deviation
c) Mode
d) Range

(xiii) Identify which of the following is a measure of dispersion?

a) Median
b) Mean
c) Mode
d) Range

(xiv) A box contains 20 electric bulbs, out of which 4 are defective. Two bulbs are chosen at random from this box. Compute the probability that at least one of these is defective is

a) 5/19
b) 6/19
c) 7/19
d) None of these

(xv) Locus of the conditional mean of the dependent variable for the fixed values of the explanatory variable _____. Identify the correct option.

a) Indifference curve
b) Population regression curve
c) Production Possibility curve
d) None of these

(xvi) Choose the correct assumptions under CLRM.

a) Linear in parameters
b) Non linear in parameters
c) X values dependent on error term
d) Positive mean value of disturbance term

(xvii) Student 't' test was formulated by _____. Select the correct option.

a) William Sealy Gosset
b) Carl Friedrick Gauss
c) Durbin Watson
d) None of these

(xviii) Identify the measure of location which is the most likely to be influenced by extreme values in the data set.

a) Range
b) Median
c) Mean
d) Mode

(xix) BLUE is _____. Select the correct option.

a) Best Linear Unbiased Estimator
b) Best Linear Unconditional Estimator
c) Basic Linear Unconditional Estimator
d) None of these

(xx) For testing of hypothesis critical region is also known as _____. Choose the correct option.

a) confidence region
b) acceptance region
c) rejection region
d) none of these

## Group-B

(Short Answer Type Questions) 5 x 7=35

2. Describe the procedure of finding median for continuous data with an example. (5)

3. Explain the advantages and disadvantages of non-parametric methods. (5)

4. Explain how to determine the sample size in a study. (5)

5. The following frequency table shows the pulse rate (in bpm) of 120 patients in a hospital: (5)

| Pulse rate | 50-60 | 60-70 | 70-80 | 80-90 | 90-100 |
|---|---|---|---|---|---|
| Frequency | 24 | 36 | 28 | ? | 2 |

Calculate the unknown frequency and the suitable diagram to represent the data.

6. The following frequency table shows the pulse rate (in bpm) of 120 patients in a hospital: (5)

| Pulse rate | 50-60 | 60-70 | 70-80 | 80-90 | 90-100 |
|---|---|---|---|---|---|
| Frequency | 11 | 36 | 28 | ? | 22 |

Calculate the unknown frequency and evaluate the mean pulse rate of the patients.

7. Given that the switch board of a consultant's office receives on the average 0.6 calls per minute, calculate the probability that: (5)

a. in a given minute, there will be at least one call

b. in a 4-minute interval, there will be at least three calls

**OR**

At a checkout counter, customers arrive at an average rate of 1.5 per minute. Calculate the probability that: (5)

a. at most four will arrive in any given minute.

b. at least three will arrive during an interval of 2 minutes.

c. at most 15 will arrive during an interval of 6 minutes.

8. The following frequency table is given below: (5)

| Class | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 |
|---|---|---|---|---|---|---|
| Frequency | 12 | 12 | 15 | 18 | 7 | 9 |

Evaluate the median of the frequency distribution.

**OR**

The following frequency table is given below: (5)

| Class | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 |
|---|---|---|---|---|---|---|
| Frequency | 17 | 14 | 2 | 10 | 15 | 10 |

Evaluate the mode of the frequency distribution.

## Group-C

(Long Answer Type Questions) 10 x 2=20

9. Describe the assumptions of simple linear regression briefly. (10)

10. Illustrate the concept of randomised block design. (10)

**OR**

Illustrate the merits and demerits of arithmetic mean. (10)

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