

**BACHELOR OF PHYSIOTHERAPY
FOURTH SEMESTER [REPEAT]
BIOSTATISTICS
BPT – 404**

(USE SEPARATE ANSWER SCRIPTS FOR OBJECTIVE & DESCRIPTIVE)

Duration: 3 hrs.

Full Marks: 70

[PART-A: Objective]

Time: 20 min.

Marks: 20

Choose the correct answer from the following:

1 × 20 = 20

- Which of the following is not statistical method?
 - The method of data collection
 - The method of analysis of data
 - The method of interpretation of data
 - None of the above
- In inferential statistics,
 - Data are summarized by using statistical tools.
 - Data are analysed in population to describe the population characteristics.
 - Data are analyzed in sample and interpretation is made about the population.
 - All of the above
- Which of the following measures, is not affected by the extreme values?
 - Quartile deviation
 - Mean deviation
 - Standard deviation
 - none of the above
- The best measure of central tendency is
 - Median
 - Mean
 - Mode
 - None of the above
- _____ is the best relative measure of dispersion.
 - Coefficient of quartile deviation
 - Coefficient of mean deviation
 - Coefficient of variation
 - None of the above
- Which of the following distribution(s) is/are continuous?
 - Normal distribution
 - Poisson distribution
 - Binomial distribution
 - Both b and c
- If X be a Poisson variate with parameter $\lambda = 9$, then the standard deviation of X is
 - 9
 - 3
 - 81
 - None of the above
- Which of the following is not a statistic?
 - Sample mean
 - Sample variance
 - Sample proportion
 - Population proportion
- Out of 50 randomly selected people, if 13 are infected by Covid-19, the sample proportion of nobody infected, is
 - undetermined
 - 0.26
 - 0.74
 - None of the above

10. If X follows a binomial distribution with parameters $n = 10$ and $p = 0.6$, then the standard deviation of X is:
- 1.55
 - 2.4
 - 6
 - None of the above
11. Which of the following statement is true for Chi-square test?
- Chi-square test is based on the normality assumption of the population
 - Chi-square test is not based on the normality assumption of the population
 - Chi-square test is applied on large sample
 - Chi-square test is applied on small sample
12. Mean of the sampling distribution of the sample proportion is_____.
- population proportion
 - population variance
 - population mean
 - None of the above
13. Analysis of variance is a statistical method of comparing the _____ of several populations.
- Proportions
 - Variations
 - Means
 - None of the above.
14. The relationship between the two characteristics "Beauty" and "Intelligence", is measured by
- Karl Pearson's coefficient of correlation
 - Spearman's rank correlation
 - linear model
 - None of the above
15. The technique of analysis of variance, was developed by
- La-Place
 - Pascal
 - Newton
 - R. A. Fisher
16. In testing of hypothesis, the null hypothesis is rejected at a certain level of significance, if
- The value of the test statistic is greater than the critical value
 - The value of the test statistic is less than the critical value
 - The value of the test statistic is equal to the critical value
 - Both b and c
17. To test the equality of two variances, which of the following test statistic is used?
- Z
 - t
 - F
 - χ^2
18. ANOCOVA procedure is a combination of
- Analysis of variance and correlation analysis
 - Analysis of variance and regression analysis
 - Both a and b
 - Neither a nor b
19. Regression is
- A mathematical function of the average relationship between two variables
 - A mathematical relationship between two variables
 - Both a and b
 - None of the above

20. When two attributes are present or absent together in the data, they are said
- a. To be independent
 - b. Negative associate
 - c. Positive associate
 - d. Neither a nor b

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[PART-B : Descriptive]

Time : 2 hrs. 40 min.

Marks : 50

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

1. Calculate mean, median, standard deviation and coefficient of variation (CV) for the following distribution: 10
- | | | | | | | |
|-----------------|---------|---------|---------|---------|---------|---------|
| Age in years : | 0 - 10 | 10 - 20 | 20 - 30 | 30 - 40 | 40 - 50 | 50 - 60 |
| | 60 - 70 | 70 - 80 | | | | |
| No. of persons: | 2 | 8 | 12 | 16 | 20 | 22 |
| | 26 | 30 | | | | |
2. If the heights of 500 students are normally distributed with mean 68.0 inches and standard deviation 3.0 inches, how many students have height 3 + 3 + 4 = 10
- (i) Greater than 72 inches
 - (ii) Less than 64 inches
 - (iii) Between 65 and 71 inches
- [Given, $Z = 1, 1.33$
 $A = 0.8413, 0.9082$]
3. (i) Explain the different types of correlation 5 + 5 = 10
(ii) How to establish a linear model to study the relationship between two variables
4. (a) Define binomial distribution. State the assumptions of this distribution. 5+5=10
(b) Write some important properties of Poisson Distribution.
5. What is testing of hypothesis? Explain one-tailed test and two-tailed test. Write the steps of conducting the testing of hypothesis. 2 + 3 + 5 = 10

6. The following table gives the number of patients present in a Physiotherapy clinic during the seven days in a week. Find at 5% level of significance, whether the patients are uniformly distributed over the week. 10

Days	Mon	Tue	Wed	Thu	Fri	Sat
No. of accidents:	14	18	12	11	15	14

[Given, the critical value of χ^2 at 5% level of significance and 5 degree of freedom is 11.07]

7. Investigate the association between darkness of eye-colour in mother and daughter from the following data 10

Mothers with dark eyes and daughters with dark eyes = 50
Mothers with dark eyes and daughters with not dark eyes = 79
Mothers with not dark eyes and daughters with dark eyes = 89
Mothers with not dark eyes and daughters with not dark eyes = 782

8. (a) Describe the importance of Statistics in Health Science 5+5=10
(b) Explain the analysis of variance (ANOVA)

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