BACHELOR OF PHYSIOTHERAPY
FOURTH SEMESTER
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*

1. Which of the following is not statistical method?
   a. The method of data collection
   b The method of analysis of data
   c. The method of interpretation of data
   d None of the above

2. In inferential statistics,
   a. Data are summarized by using statistical tools.
   b. Data are analysed in population to describe the population characteristics.
   c. Data are analyzed in sample and interpretation is made about the population.
   d. All of the above

3. Which of the following measures, is not affected by the extreme values?
   a. Quartile deviation
   b. Mean deviation
   c. Standard deviation
   d. none of the above

4. The best measure of central tendency is
   a. Median
   b. Mean
   c. Mode
   d. None of the above

5. _____ is the best relative measure of dispersion.
   a. Coefficient of quartile deviation
   b. Coefficient of mean deviation
   c. Coefficient of variation
   d. None of the above

6. Which of the following distribution(s) is/are continuous?
   a. Normal distribution
   b. Poisson distribution
   c. Binomial distribution
   d. Both b and c

7. If X be a Poisson variate with parameter $\lambda = 9$, then the standard deviation of X is
   a. 9
   b. 3
   c. 81
   d. None of the above

8. Which of the following is not a statistic?
   a. Sample mean
   b. Sample variance
   c. Sample proportion
   d. Population proportion

9. Out of 50 randomly selected people, if 13 are infected by Covid-19, the sample proportion of nobody infected, is
   a. undetermined
   b. 0.26
   c. 0.74
   d. 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:
    a. 1.55
    b. 2.4
    c. 6
    d. None of the above

11. Which of the following statement is true for Chi-square test?
    a. Chi-square test is based on the normality assumption of the population
    b. Chi-square test is not based on the normality assumption of the population
    c. Chi-square test is applied on large sample
    d. Chi-square test is applied on small sample

12. Mean of the sampling distribution of the sample proportion is_____.
    a. population proportion
    b. population variance
    c. population mean
    d. None of the above

13. Analysis of variance is a statistical method of comparing the _____ of several populations.
    a. Proportions
    b. Variances
    c. Means
    d. None of the above.

14. The relationship between the two characteristics "Beauty" and "Intelligence", is measured by
    a. Karl Pearson's coefficient of correlation
    b. Spearman's rank correlation
    c. linear model
    d. None of the above

15. The technique of analysis of variance, was developed by
    a. La-Place
    b. Pascal
    c. Newton
    d. R. A. Fisher

16. In testing of hypothesis, the null hypothesis is rejected at a certain level of significance, if
    a. The value of the test statistic is greater than the critical value
    b. The value of the test statistic is less than the critical value
    c. The value of the test statistic is equal to the critical value
    d. Both b and c

17. To test the equality of two variances, which of the following test statistic is used?
    a. Z
    b. t
    c. F
    d. χ^2

18. ANOCOVA procedure is a combination of
    a. Analysis of variance and correlation analysis
    b. Analysis of variance and regression analysis
    c. Both a and b
    d. Neither a nor b

19. Regression is
    a. A mathematical function of the average relationship between two variables
    b. A mathematical relationship between two variables
    c. Both a and b
    d. 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   10
   variation (CV) for the following distribution:
   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 $3 + 3 + 4 = 10$
   inches and standard deviation 3.0 inches, how many students have
   height
   (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 $5+5=10$
        distribution.
   (b) Write some important properties of Poisson Distribution.

5. What is testing of hypothesis? Explain one-tailed test and two-tailed $2 + 3 + 5 = 10$
   test. Write the steps of conducting the testing of hypothesis.

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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