J-02012102 Seat No. _____

Third Year B. A. S. L. P. Examination

July - 2019

B - 3.6 : Bio-Statistics & Scientific Enquiry in Audiology & Speech Language Pathology

Time : **3** Hours] [Total Marks : **80**

Instructions : (1) Answers should be brief and to the point.

(2) Figures to the right indicate the marks of the question.

(3) Illustrate answers with suitable diagram where applicable.

SECTION - A

1 Long answer type question : (attempt any **one**) **1×15=15**

(a) What are the different sampling methods? Explain each method with suitable example.

OR

(b) What is the meaning of measurement in research? What difference does it make whether we measures in terms of nominal, ordinal, interval or ratio scale ? Explain giving examples.

2 Long answer type question : (attempt any **one**) **1×15=15**

(a) Define correlation. What are the different types of correlation ? Explain using diagrams.

OR

(b) What are the different applications of using a chi square test ?

From the following data find out if there is a significant difference between incidence of accidents among power and hand driven machines using the chi square test.

($\chi^2 = 3.84$ at df = 1 and p = 0.05 level)

Group	Accidents	No accidents
Power machine	8	112
Hand driven machine	15	165

3 Write very short notes on following : (attempt **all**) **5×2=10**

(a) Type I Error

(b) Skewness

(c) Measures of dispersion

(d) Briefly explain the term - (1) Confounding (2) Double blinding.

(e) Mean pulse rate of a population is believed to be 72/minute with SD of 8. Calculate minimum sample size to verify this if allowable error is 1 at 5% significance level.

SECTION - B

4 Write short notes on following : (attempt any **four**) **4×5=20**

(a) Surgical unit of C. U. Shah Medical College and Hospital performed the following number of operations each month in the year 2018.
15,18, 25, 25, 40, 25,18, 25, 21, 30, 33, 25
Calculate mean, median, mode and SD.

(b) Depict the following data with appropriate graphical presentation.

Year	Exports (Crores of Rupees)	Imports (Crores of Rupees)
1960-61	610	624
1961-62	955	742
1962-63	660	578
1963-64	565	527

(c) In a nutritional study, 100 children were given a usual diet with Vitamin A and D tablets. After 6 months their average weight was 30 kg with SD of 2 kg. While the average weight of second comparable group of 100 children who were taking the usual diet only was 29 kg with SD of 1.8 kg. Can we say that Vitamins A and D were responsible for this difference ?
($z = 1.96$ at $p = 0.05$ level)

(d) What are the uses of biostatistics in medical research ?

(e) Write a note on different types of data with suitable examples.

5 Choose the best fitting answer : (attempt **all**) **20×1=20**

(1) The median is a measure of

(a) Relative dispersion (b) Absolute dispersion

(c) Central location (d) Relative location

(2) Weight in kg is an example of

(a) Normal variable (b) Discrete variable

(c) Confounding variable (d) Continuous variable

(3) A scatter diagram shows
   (a) Trend of events with passage of time
   (b) Proportion of an event
   (c) Relationship between two variables
   (d) Statistics as a pie chart

(4) The result of a test was given as very satisfied, satisfied and dissatisfied. In which scale does it belong ?
   (a) Nominal scale (b) Ordinal scale
   (c) Interval scale (d) Ratio scale

(5) Out of 11 births in a hospital, 5 babies weighed over 2.5 kg and 5 weighed less than 2.5 kg. What value do 2.5 represent ?
   (a) Geometric average (b) Arithmetic average
   (c) Median (d) Mode

(6) If the systolic blood pressure in a population has a mean of 130 mm and a median of 140 mm Hg, then the distribution is said to be
   (a) Symmetrical
   (b) Positively skewed
   (c) Negatively skewed
   (d) Either positively or negatively

(7) A measure of location which divides the distribution in the ratio of 3:1 is
   (a) Median (b) First quartile
   (c) Third quartile (d) Mode

(8) Shape of the normal curve depends on
   (a) Mean
   (b) Standard deviation
   (c) Number and nature of observation
   (d) All of the above

(9) All are true about cluster sampling except
   (a) Sample size is same as that of simple random sampling
   (b) Results can be generalized to the population
   (c) Clusters are naturally occurring groups
   (d) Less efficient method than simple random sampling

(10) The number of patients in a clinical trial to treat a specific disease increases as
   (a) The incidence of the disease decreases
   (b) The significance level increases
   (c) The size of the expected treatment effect increases
   (d) The dropout rate increases

(11) Value of 'p' indicates
(a) Degree of similarity between two sets of measurements
(b) Degree of dissimilarity between two sets of measurements
(c) If lower than 0.001 then the result is not significant
(d) None of the above

(12) If we reject Null Hypothesis, when actually it is true, it is known as
(a) Type I error (b) Type II error
(c) Power (d) Specificity

(13) All of the following are markers of association except
(a) Odd's ratio (b) P value
(c) Alpha (d) Correlation coefficient

(14) If each value of a given group of observation is multiplied by 10, the standard deviation of the resulting observation would be
(a) Original SD × 10 (b) Original SD /10
(c) Original SD – 10 (d) Original SD itself

(15) Chi-square test is used to measure the degree of
(a) Causal relationship between exposure and effect
(b) Association between two variables
(c) Correlation between two variables
(d) Agreement between two variables

(16) All of the following are non-parametric test except
(a) Student's t test (b) Chi-square test
(c) Spearman's test (d) McNemar test

(17) The correlation between variables A and B in a study was found to be 1.1, this indicates
(a) Very strong correlation
(b) Moderately strong correlation
(c) Weak correlation
(d) Computational mistake in calculating correlation

(18) A 2×2 contingency table construction is applicable in the calculation of the following except
(a) Relative risk
(b) Odd's ratio
(c) Validity of screening test
(d) Regression coefficient

(19) Most appropriate method to know about contribution of risk factor to disease
(a) Relative risk (b) Attributable risk
(c) Absolute risk (d) Odd's ratio

(20) Which is not an analytical observational study ?
(a) Case control study (b) Cohort study
(c) Ecological study (d) Field trails