(8 pages) **Reg. No. :** .....

Code No. : 7607 **Sub. Code : KZOM 32/ PZOM 33**

M.Sc. (CBCS) DEGREE EXAMINATION, NOVEMBER 2019.

Third Semester

Zoology

BIOSTATISTICS AND BIOINFORMATICS

(For those who joined in July 2016 and afterwards)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Chi square test X2
   (a) Measure the degree of deviation of the experimental result from the expected result
   (b) To test the closeness of observed and expected frequency
   (c) To test the population variance and sample
   (d) All of the above

2. Standard deviation is the square of
   (a) Mode
   (b) Standard error
   (c) Median
   (d) Variance

3. A circle divided into sectors proportional to the frequency of items shown is called
   (a) Bar chart
   (b) Histogram
   (c) Pie chart
   (d) Frequency polygon

4. The mean of a distribution is 14 and the standard deviation is 5. What is the value of the coefficient of variation?
   (a) 60.4%
   (b) 48.3%
   (c) 27.8%
   (d) 35.7%

5. The student's t test is used for

(a) Small sample size

(b) Large sample size

(c) Data transformation

(d) None of the above

6. Co-efficient of variation denotes

(a) Mean deviation

(b) Percent variation of mean in relation with standard deviation

(c) Standard error

(d) None of the above

7. A hypothesis which is stated for purpose of possible acceptance is called

(a) Null hypothesis

(b) Alternative hypothesis

(c) Functional hypothesis

(d) None of the above

8. Standard error is

(a) $\bar{x} = \frac{\sum x_i}{n}$

(b) $IQR = Q_3 - Q_1$

(c) $\mu_x = \frac{\sum x_i}{N}$

(d) $\sigma = X\frac{\sigma}{\sqrt{n}}$

9. Which of the following is not a correct about BLAST?

(a) The BLAST web server has been designed in such away as to simplify the task of program selection.

(b) The programs are organized based on the type of query sequences

(c) The programs are organized based on the type of nucleotide sequences, or nucleotide sequence to be translated

(d) BLAST is not based on heuristic searching methods

10. _____ compares protein sequence against protein databases.

(a) blastn

(b) blastp

(c) blastx

(d) tblastx

PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Describe the importance of sampling in statistical analysis.

Or

(b) Give an account on various graphical representations of biological data.

12. (a) Consider the following data which are amino acids concentration $(\mu g/100ml)$ in arthropod hemolymph

240, 238, 236, 245, 242, 248, 237

Calculate the standard deviation and standard error.

Or

(b) Explain uses of regression analysis in biology.

13. (a) Enumerate the procedures of use of one-way classification in analysis of variance.

Or

(b) Define poisson's distribution and add a note on the important methods of measuring distribution.

14. (a) Explain the Mann-Whitney U test and its uses.

Or

(b) Describe in brief about the addition and multiplication theories of probability.

15. (a) Give an account on the importance of information technology in biology.

Or

(b) Briefly explain the data base similarity tools -BLAST and FASTA.

PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Describe the methods of classification and tabulation of biological data.

Or

(b) Give a detailed account on primary and secondary data collection with suitable examples.

17. (a) The frequency distribution given below describes the distribution of a sample of 100 molluscan shell distributed according to the length

Length in mm	50-52	53-55	56-58	59-61	62-64
No of shells	5	20	40	28	7

Calculate the mean, median and standard deviation

Or

(b) In trying to evaluate the effectiveness of antibiotics in killing bacteria, a research institution complied the following information

Antibiotics (mg)	12	15	14	16	17	10
Bacteria (lakhs)	5	7	5.6	7.2	8.6	6.2

Calculate correlation co-efficient for bacteria on antibiotics

18. (a) Enumerate types of asymmetrical distribution with suitable illustrations.

Or

(b) What are non-parametric tests, when they are preferred in data analysis?

19. (a) Define Yates correction? Explain the usefulness of chi-square test of goodness of fit in testing independence of attributes.

Or

(b) What is F test? Given below are the on gains in weight (in pounds) of guinea pigs fed on three diets

Diet 1	40	24	46	29
Diet 2	11	21	17	28
Diet 3	19	24	34	29

Test at 5% level of significance whether the feeds have impact of weight gain in given group

20. (a) Write an essay on biological database and explain the application of software's in data base management systems.

Or

(b) Write an essay on molecular modeling and visualizing tools and its importance.

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