M.Sc. ZOOLOGY
First Semester
TAXONOMY, BIOSYSTEMATICS & BIOSTATISTICS
(MSZ – 101)

Duration: 3Hrs. **Full Marks: 70**

PART A (Objective) =20
PART-B (Descriptive)=50

PART-B (Descriptive)

Duration: 2 hrs. 40 mins. **Marks: 50**

Answer any *five of* the following questions:

1. What is Chemotaxonomy? What are the limitations of chemotaxonomy? Describe how Chromatography technique is used in Chemotaxonomy. (2+4+4=10)
2. Describe about the biological species concept. What are the difficulties in the application of biological species concept? (5+5=10)
3. Distinguish between: (2×5=10)
   a) Allopatric and sympatric species.
   b) Holotype and syntype.
   c) Binomial nomenclature and Trinomial nomenclature.
   d) Peripatric and parapatric species.
   e) Cryptic species and sibling species.
4. Discuss the International Code of Zoological nomenclature with special reference to the rules of nomenclature. (10)

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5. What is procedural taxonomy? Write about the importance of Museum collection. Write briefly about the different methods of collection of Invertebrate species. (2+2+6=10)

6. What do you mean by sample and sampling? Explain it with the help of some examples. Why sampling is essential in biostatistics? (2+3+5=10)

7. Define Arithmetic mean, Geometric mean and Harmonic mean. Mention merits and demerits of each measure. (2+2+2+4=10)

8. What is X^2 test? Enumerate the hypothesis on which it is based. (2+8=1

Or

(a) Weight (g) of albino rat, reared on normal diet, before and after treatment with stanozolol for 30 days is given below. (5)

Rats	1	2	3	4	5	6	7	8	9	10
Before treatment	105	95	85	102	108	103	95	87	102	90
After 30 days of treatment	115	100	95	121	112	105	99	89	110	95

Find out whether the treatment causes significant increase in weight.

[table value of "t" at 9 df is 1.83 (p = 0.05)

(b) Four different types of biofertizers are applied in 40 different experimen plots and the production of paddy (Autumn = Ahu) per hectare obtained was

Nitrogen fixing	Phosphorous solubilising	Phosphate mobilizing	Plant growth promoting
1000	990	900	800
1100	930	980	890
1020	900	880	850
1035	980	845	1000
1080	1040	890	890
990	990	890	790
1070	900	1000	850
1200	960	895	800

(5)

Find out whether there is any significant difference in mean production due to the varieties of biofertilizers

[The critical value of F (table value) at (3, 36) degree of freedom is 2.87]

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Duration: 20 minutes **Marks – 20**

PART-A (Objective)

Time: 20 mins **Total Marks: 20**

I. Choose the correct option: **1×15=15**

1. Alpha taxonomy concern with the
   (a) Analysis of intraspecific variations and evolutionary studies.
   (b) Describing new species, characterizing and naming the species.
   (c) Arrangement of species into natural system of classification.
   (d) None of the above.

2. Linnaeus gave natural system of classification based on
   (a) Morphology (b) Evolutionary trend
   (c) Anatomy (d) All of these

3. Phylogenetic classification is based on
   (a) Utilitarian system (b) Common evolution
   (c) Habit and habitat (d) External similarity

4. Bio systematics aims at
   (a) Identification and arrangement of organisms on the basis of their cytological characteristics.
   (b) The classification of organism based on broad morphological characters.
   (c) The classification of organisms based on their evolutionary history and establishing their phylogeny on the totality of various parameters from all fields of studies.
   (d) Delimiting various taxa of organisms and establishing their relationship.

5. What is the basic unit of classification?
   (a) Phylum (b) Class
   (c) Order (d) Species

6. A new species can be formed when
   (a) Individual variations leads to sexual isolation.
   (b) Common genotype of similar species.
   (c) An individual is produced by the combined effects of phonotypic and environmental influences.
   (d) There is no relationship between genotype and phenotype.

7. The characterization and identification of a cell's complete chromosome set is referred to as
   (a) Chemotaxonomy (b) Cytotaxonomy
   (c) Karyotyping (d) None of the above

8. Which of the following has name bearing function?
   (a) Lectotype (b) Paralectotype
   (c) Paratype (d) Allotype

9. Two or more species occupying identical or overlapping areas are known as
   (a) Sympatric Species (b) Sibling Species
   (c) Poly lypic Species (d) Allopatric Species

10. Closely related, morphologically similar sympatric population, but reproductively isolated
   (a) Clines (b) Demes
   (c) Clones (d) Sibling Species

11. The book "Systema Naturae" was written by
   (a) Linnaeus (b) Aristotle
   (c) Lamarck (d) Darwin

12. The suffix "idae" is used after
   (a) Order (b) Class (c) Family (d) Genus

13. A taxonomic key which has two choices at each step is
   (a) Dichotomous (b) Polytomous
   (c) Diarctic (d) Diploid

14. While performing a chi-square test, the data must be:
   (a) In raw form as scores (b) In proportion
   (c) In percentage (d) In ratio

15. Chi-square test is the test of significance or goodness of fit, was given by the statistician
   (a) Karl Pearson (b) Fisher (c) Elhans (d) Guil ford

II. Fill in the blanks- **1×5=5**

1. Arithmetic mean has a bias for _____ values where as Geometric mean has bias for_____ observations.
2. The mean is Calculated from the formula M = _____.
3. The degree to which the individual values of the variate scatter away from the average or central value is called a _____.
4. Systematic sampling is calculated by the formula K = _____.
5. Research workers of life science uses the computer _____
   Choose the correct choice_____ programs _____ and _____.

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