

M.Sc. ZOOLOGY
First Semester (Repeat)
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 four from Question no. 2 to 8
Question no. 1 is compulsory.

1. Explain how collected specimens are identified with special emphasis on taxonomic keys and their various styles. (10)
2. Describe Chemotaxonomy with example. Describe how chromatography is employed in chemotaxonomy? (2+8=10)
3. What are type specimens? What are the needs and importance of type specimens? Discuss in brief the different zoological types recognized by the ICZN. (2+2+6=10)
4. In an effluent affected river, plankton density (/100m²) of three sites are given in below:

Site I: 483, 489, 481, 480, 491, 489, 479, 490

Site II: 506, 498, 497, 501, 50, 536, 499, 502, 505

Site III: 520, 527, 518, 519, 516, 526, 521, 523, 521, 525, 522

Find whether there is any significant difference in mean plankton density between the sites ($F_{2,25}$ at 5% level of significance is 3.3) (10)

5. Explain whether DNA can be a type specimen and comment on the process of typification. (10)

6. Differentiate between:

(2.5×4=10)

- (i) Parapatric and Peripatric species.
- (ii) Cryptic and Sibling species.
- (iii) Monotypic and Polytypic species.
- (iv) Allopatric and Sympatric species.

7. The weight (in g) of 10 guineapigs when bought in the laboratory and after one month of rearing on diets fortified with multi vitamins were recorded. Calculate and infer whether gain in weight is statistically significant or not (t at 5% level of significance with 8 degree of freedom is 3.36) (10)

8. Write the answers:

(2×5=10)

- (i) Describe Biological species concept. What are the limitations of Biological species concept?
- (ii) Give a brief account of the different infraspecific terms and infraspecific categories.

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Marks – 20

(PART A - Objective Type)

I. Choose the correct answer:

1×20=20

1. Standard deviation:
 - (i) is square root of arithmetic mean of the squared deviation.
 - (ii) ignores 50% of the extreme items.
 - (iii) is the average difference between the items of distribution and mean of that series.
 - (iv) represents the dispersion of the sample mean around the total population mean.
2. A taxonomic key which has two choices at each step is:
 - (i) Dichotomous
 - (ii) Polytomous
 - (iii) Diarctic
 - (iv) Diploid
3. To determine the correct place of a organism in a previously established plan of classification is called:
 - (i) Class
 - (ii) Taxonomy
 - (iii) Identification
 - (iv) Systematics
4. Which of the following technique is used for routine cytotaxonomy analysis?
 - (i) DNA Sequencing
 - (ii) DNA Fingerprinting
 - (iii) DNA Barcoding
 - (iv) None of the above
5. The characterization and identification of a cell's complete chromosomes set is referred to as:
 - (i) Genome
 - (ii) Karyotyping
 - (iii) Cytotaxonomy
 - (iv) None of the above
6. Protein fractions in electrophoretic techniques is used as tools in:
 - (i) Cytotaxonomy
 - (ii) Chemotaxonomy
 - (iii) Numerical taxonomy
 - (iv) Molecular taxonomy
7. Zero correlation is seen:
 - (i) When two variables are completely dependent.
 - (ii) When two variables are independent of each other.
 - (iii) When two variables are partially dependent.
 - (iv) When two variables are partially negatively correlated.
8. Species occupying different geographical areas are called:
 - (i) Allopatric species
 - (ii) Sibling species
 - (iii) Sympatric species
 - (iv) Cryptic species
9. Which among the following is not recognized in the taxonomic hierarchy?
 - (i) Cline
 - (ii) Race
 - (iii) Variety
 - (iv) All
10. The key most useful to non-specialist and field workers is:
 - (i) Pictorial key
 - (ii) Branching type key
 - (iii) Box type key
 - (iv) All of these
11. Bird skins prepared by removing all bones, bills and legs is known as:
 - (i) ROM
 - (ii) Shmoo
 - (iii) Flat skin
 - (iv) Catapult
12. A specimen of the opposite sex of a holotype is called:
 - (i) Lectotype
 - (ii) Paralectotype
 - (iii) Paratype
 - (iv) Allotype
13. Taxonomy concerns itself with the arrangement of species into a natural system of classification into a system of lower and higher categories called:
 - (i) *Alpha taxonomy*
 - (ii) *Beta taxonomy*
 - (iii) *Gamma taxonomy*
 - (iv) None of the above
14. A holotype in case of protista which consist of more than one related individuals is a:
 - (i) Neotype
 - (ii) Hapantotype
 - (iii) Syntype
 - (iv) Isotype

