

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 four from Question no. 2 to 8
Question no. 1 is compulsory.

1. Differentiate between: (2.5×4=10)
 - (i) Monotypic and Polytypic species
 - (ii) Allopatric and Sympatric species
 - (iii) Parapatric and Peripatric species
 - (iv) Cryptic and Sibling species

2. 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.

3. Describe Chemotaxonomy with example. Describe how chromatography is employed in chemotaxonomy. (2+8=10)

4. Explain how collected specimens are identified with special emphasis on taxonomic keys and their various styles. (10)

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

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Duration: 20 minutes

Marks – 20

(PART A - Objective Type)

I. Choose the correct answer:

1×20=20

1. 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
2. The term “New Systematic” was proposed by
 - (i) John Ray
 - (ii) Julian Huxley
 - (iii) Aristotle
 - (iv) Adanson
3. 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
4. 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
5. Protein fractions in electrophoretic techniques is used as tools in
 - (i) Cytotaxonomy
 - (ii) Chemotaxonomy
 - (iii) Numerical taxonomy
 - (iv) Molecular taxonomy
6. 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

7. A taxonomic key which has two choices at each step is
 - (i) Dichotomous
 - (ii) Polytomous
 - (iii) Diarctic
 - (iv) Diploid
8. Bird skins prepared by removing all bones, bills and legs is known as
 - (i) ROM
 - (ii) Shmoo
 - (iii) Flat skin
 - (iv) Catapult
9. A specimen of the opposite sex of a holotype is called
 - (i) Lectotype
 - (ii) Paralectotype
 - (iii) Paratype
 - (iv) Allotype
10. A holotype in case of protista which consist of more than one related individuals is a
 - (i) Neotype
 - (ii) Hapantotype
 - (iii) Syntype
 - (iv) Isotype
11. To determine the correct place of an organism in a previously established plan of classification is called
 - (i) Class
 - (ii) Taxonomy
 - (iii) Identification
 - (iv) Systematics
12. A taxonomic key which has two choices at each step is
 - (i) Dichotomous
 - (ii) Polytomous
 - (iii) Diarctic
 - (iv) Diploid
13. Pitfall traps are employed to capture
 - (i) Invertebrates
 - (ii) Amphibia
 - (iii) Reptilia
 - (iv) All of these
14. 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

15. 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.

16. 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.

17. Populations that are morphologically similar but do not interbreed for physiological or behavioural reasons are grouped as

- (i) Races
- (ii) Sub-species
- (iii) Varieties
- (iv) Sibling species

18. Species occupying different geographical areas are called

- (i) Allopatric species
- (ii) Sibling species
- (iii) Sympatric species
- (iv) Cryptic species

19. Biological species concept as proposed by Mayr applies to

- (i) Species which form hybrids
- (ii) Paleospecies
- (iii) Sexually reproducing species
- (iv) All of these

20. Which among the following is not recognized in the taxonomic hierarchy?

- (i) Cline
- (ii) Race
- (iii) Variety
- (iv) All
