2015

ZOOLOGY

Paper : 101 (Old Course)

BIOSYSTEMATICS & BIOSTATISTICS

Full Marks : 80

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Answer the following multiple choice questions (any eight) 1 x 8 = 8

I. A species may be reproductively isolated through which of the following causes?

a) behavior

b) anatomy

c) ecology

d) all the above

II. Speciation because of geographical isolation is known as

a) parapatric speciation

b) allopatric speciation

c) cladogenesis

d) anagenesis

III. Select the correct sequence of taxonomy

a) Classification>Identification >Description>Naming

b) Classification>Identification>Naming>Description

c) Identification>Naming> Classification>Description

d) Identification>Classification>Naming>Description

IV. Taxonomic characters provide the evidence of:

a) Morphological characters

b) Physiological characters

c) Phylogeny between the taxa

d) Molecular characters

V. Morphologically similar but reproductively isolated organisms are called:

a) Allopatric species

b) Sympatric species

c) Sibling species

d) Subspecies species

VI. Two species A and B were hybridized to form species C, which of the following technique can be used to confirm that the species C is hybrid:

a) Molecular marker analysis

b) Protein iso-enzymes

c) Phenotypic relations

d) Phylogenetic analysis

VII. In molecular taxonomy, DNA barcoding provides a way to compare:

a) Evolution of different species

b) Similarity of amino acid sequences

c) Total genome of different species

d) All of the above

VIII. Which is CORRECT in terms of weightage of taxonomic characters?

a) Phenotypic characters produce by different ancestral gene are of high weight

b) Phyletic characters rather than phenotypic characters are high weight

c) Characters that are product of the genome have high taxonomic weightage

d) Complexity, variability and constancy are high weight taxonomic characters

IX. To evaluate the significance of the difference between more than two variable means the following test is applied:

a) t-test b) chi-square test

c) ANOVA d) Variance ratio test

X. In molecular taxonomy, the technique of DNA hybridization provides a way of comparing:

a) Origin of different species

b) Similarity of amino acid sequences

c) Total genome of different species

d) All of the above

2. Answer the following short type questions (any five)

2 x 5 = 10

a) How does taxonomic character help in identifying sibling species?

b) What do you mean by sampling and sampling errors in biostatistics?

c) "Geographical isolation is not the only mechanism of speciation" Justify the statement.

d) What are the aims and task of a taxonomist?

e) What is the importance of recognizing polytypic species in taxonomy?

f) What are central Tendency and its importance?

3. Answer the following questions (any four) 5 x 4 = 20

a) Write short notes on speciation.

b) Molecular systematics is preferred over age old morphological taxonomy today" – justify.

c) What mechanisms permit the maintenance of genetic variability in natural populations?

d) What is molecular taxonomy and how does it differs from physiological taxonomic characters?

e) Define mean, median and mode. What is its significance in the Statistic?

4. Answer the following questions (any two 9x2 =18

a) What is super-species? Describe the different theories of speciation. 1+8

b) Define genetic material. Explain in which way genetic alteration lead to the intrapopulation variation and speciation? 1+4+4

c) How behavioral and ecological adaptation helps in speciation? How do you correlate molecular taxonomy with these taxonomic characters? 5+4

5. Answer the following questions (any two) 12x2 =24

a) What is taxonomic character? Describe the low and high weight taxonomic characters with examples. What are the necessary steps a taxonomist should take in order to choose a character? 2+6+4

b) What is variation? How does it differ from speciation? What are the new approaches to systematics and their used in speciation? 1+2+9

c) The diastolic blood pressure of 11 individuals is as follows: 70, 95, 65, 76, 85, 70, 80, 91, 94, 68 and 92. Calculate the Standard deviation. 12

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