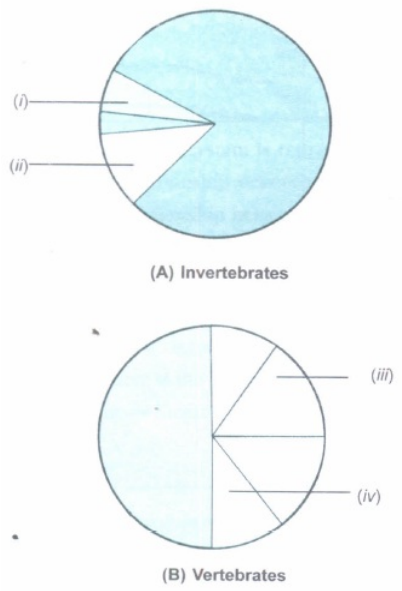
Exam Time: 00:30 Hrs Date: 2025-10-14
Total Marks: 8

Questions:

Case Study Questions

1.The global animal diversity is shown in the pie charts (A-Invertebrates and B-vertebrates) drawn below.
Answer the questions that follow.



(a) Name the animal groups that are represented by the areas shaded black in A and B, respectively. Also, mention the kind of habitat, where you would find these groups of animals.
(b) Identify the following groups of animals in the pie diagrams: Crustaceans and Amphibians.

2.**Read the following and answer any four questions from (i) to (v) given below:**
Edward Wilson described diversity at all levels of biological organisation ranging from macromolecules inside the cells to biomes. It is of three inter-related hierarchial levels- genetic diversity, species diversity and community ecosystem diversity. Species diversity is the variety in the number and richness of the species of a region. For example, the Western ghats have a greater amphibian species diversity than the Eastern ghats.
(i) The number of species per unit area is called

(a) species evenness **(b) species richness** **(c) species equitability** **(d) both (a) and (c).**

(ii) The table below gives the population (in thousands) of ten species (A - J) in four areas (I - IV) consisting of the number of habitats given within brackets against each. Study the table and answer the question which follows:

Area and number of habitats	**Species and their population (in thousands) in the area**									
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**

I(11)	23	12	0.52	6.0	-	3.1	1.1	9.0	-	10.3
II(11)	10.2	-	0.62	-	1.5	3.0	-	8.2	1.1	11.2
III(13)	11.3	0.9	0.48	2.4	1.4	4.2	0.8	8.4	2.2	4.1
IV(12)	3.2	10.2	1.1	4.8	0.4	3.3	0.8	7.3	1.3	2.1

Which are out of I to IV shows maximum species diversity?

(a) II (b) III (c) IV (d) I

(iii) Study the given populations and choose the correct answer in relation to species diversity.

Population	**Species**	**Group**	**Individuals**
	I	Mammals	3
Population A	II	Birds	2
	III	Amphibians	2
	I	Mammals	2
Population B	II	Mammals	2
	III	Amphibians	1
	I	Mammals	3
Population C	II	Mammals	2
	III	Mammals	1

Maximum diversity Minimum diversity

(a) Population B Population C

(b) Population A Population C

(c) Population A Population B

(d) Population B Population A

(iv) The concept of species diversity has two components : evenness and richness. Evenness is based on the relative abundance of species. Richness is based on the total number of species present. Diversity indices combine a measure of richness and evenness. The Simpson index (D) is calculated from the following equations:

$D = \sum_{i=1} (n_i/N)^2$

where, n = total number of organisms of particular species

N = total number of organisms of all species

Below are data collected in two terrestrial plant communities that represent part of a successional

chronosequence. In this case the values were measured as percent cover.

Early Successional Community		**Late Successional Community**	
Species	Percent Cover	Species	Percent Cover
A	83	F	24
B	5	G	20
C	9	H	18
D	2	I	23
E	1	J	15

The data indicate that, relative to the early successional community, the late successional community has which of the following characteristics?

Species Richness	**Evenness**
(a) Higher	**Higher**
(b) Higher	**Lower**
(c) Same	**Lower**

(d) Same **Higher**

(v) Select the incorrect statement regarding species diversity.

(a) It results in polymorph formation and is useful in adaptation to changes in environmental conditions.

(b) Number of individuals of different species represent species evenness.

(c)It influences biotic interactions and stability of the community.

(d) It is a trait of the community.

Answers Key:

Case Study Questions

1. (a) A - Insects; they are present in soil, water, on the plants and animals.
   B - Fishes; they are aquatic, both marine and freshwater.
   (b) (ii) Crustaceans (iv) Amphibians.
2. **(i) (b) :** The number of species per unit area is called species richness.
   (ii) (b)
   (iii) (b)
   (iv) (d)
   (v) (a) : Genetic diversity results in polymorph formation and is useful in adaptation to changes in environmental conditions.