

ANSWER KEY & MARKING SCHEME · CBSE CLASS 11**The Living World**

Biology · Chapter 1 · Use this with the Board Paper · Companion to Quick Drill

HOW TO USE

Attempt the Board Paper first (closed-book, full time). Then come here. For 2-mark+ questions, compare your answer to the model. For 3-4 mark questions, also consult the **Topper Templates** below — these show the exact step-by-step structure that scores full marks per CBSE marking-scheme conventions.

MODEL ANSWERS · BOARD PAPER**Section A — Very Short Answer (1 mark each, 4 Qs)**

Q1. Name the system of naming organisms with two Latinised words and the scientist who gave it. [1 mark]

| **Ans:** Binomial nomenclature, given by Carolus (Carl) Linnaeus.

Q2. Which is the basic (lowest) unit of taxonomic classification? [1 mark]

| **Ans:** Species.

Q3. Expand ICZN and state what it governs. [1 mark]

| **Ans:** International Code of Zoological Nomenclature — it governs the scientific naming of animals.

Q4. What is the approximate number of species described on Earth so far? [1 mark]

| **Ans:** About 1.7 to 1.8 million species.

Section B — Short Answer I (2 marks each, 3 Qs)

Q5. Differentiate between a 'taxon' and a 'category' with one example each. [2 marks]

| **Ans:** A CATEGORY is an abstract rank in the taxonomic hierarchy (e.g. Class, Order). A TAXON is an actual group of real organisms placed at a rank — e.g. 'Mammalia' is a taxon at the category 'Class'; 'Carnivora' is a taxon at the category 'Order'. Category = the slot; taxon = the organisms filling it.

Q6. What is a herbarium? State any one piece of information found on a herbarium label. [2 marks]

| **Ans:** A herbarium is a store house of dried, pressed and preserved plant specimens mounted on sheets and arranged according to an accepted system of classification. A label carries information such as the date and place of collection, scientific and common name, family, and the collector's name (any one).

Q7. Why can common (local) names not be used in scientific communication? Give one example. [2 marks]

| **Ans:** Common names vary from region to region and language to language, so they are ambiguous across the world — e.g. the mango is called 'aam', 'maamidi' and 'mango' in different languages. A single universal scientific name (*Mangifera indica*) removes this ambiguity.

Section C — Short Answer II (3 marks each, 3 Qs)

Q8. Why are growth and reproduction NOT considered defining properties of all living organisms? Name the properties that ARE defining. [3 marks]

| **Ans:** Growth is not defining because non-living things also grow — a mountain or crystal grows by accretion (addition from outside) — and adult organisms stop growing yet stay alive. Reproduction is not defining because many living organisms do not reproduce — sterile worker bees, mules, and infertile individuals are alive but cannot reproduce. The truly defining properties are metabolism, cellular organisation, and consciousness (consciousness being the ultimate defining property).

Q9. State the rules of binomial nomenclature using *Mangifera indica* as your example. [3 marks]

| **Ans:** (i) Each name has two Latinised words — the first is the genus (*Mangifera*), the second the specific epithet/species (*indica*). (ii) The genus begins with a capital letter, the species with a small letter. (iii) The name is printed in italics, or each word is underlined separately when handwritten, to show Latin origin. (iv)

The author who first described the species is written after it, e.g. *Mangifera indica* Linn.; plant names are governed by ICBN and animal names by ICZN.

Q10. Differentiate between taxonomy and systematics. Why is Carolus Linnaeus important to both? [3 marks]

Ans: TAXONOMY deals with the classification of organisms and rests on characterisation, identification, classification and nomenclature — it answers 'what is this and where does it belong?'. SYSTEMATICS (from Latin 'systema') includes all of taxonomy but ALSO studies the evolutionary relationships and kinships between organisms — it adds 'how is it related to others through descent?'. Carolus Linnaeus is central to both: he gave the binomial nomenclature system and the hierarchical classification, and titled his landmark work *Systema Naturae*, founding modern taxonomy.

Section D — Long / Case-Study (5 + 6 marks, 2 Qs)

Q11. (a) Arrange the seven taxonomic categories in the correct descending order. (b) Define species as the basic unit of classification. (c) Place the human (*Homo sapiens*) into the full hierarchy. (d) State how the number of shared characters and the number of organisms change as we move DOWN the hierarchy. [5 marks]

Ans: (a) Kingdom → Phylum (Division in plants) → Class → Order → Family → Genus → Species. (b) Species is the lowest, basic (obligate) unit — a group of individuals with fundamental similarities that can interbreed and are reproductively isolated from other such groups. (c) *Homo sapiens*: Kingdom Animalia → Phylum Chordata → Class Mammalia → Order Primata → Family Hominidae → Genus *Homo* → Species *sapiens*. (d) Moving DOWN the hierarchy (Kingdom → Species), the number of shared/common characters INCREASES while the number of organisms in the group DECREASES.

Q12. Read the passage and answer: A botany student collects an unfamiliar flowering plant on a field trip. To name it correctly and store it, she uses several taxonomical aids — she first identifies it using a published analytical tool, then dries and presses it onto a labelled sheet, and later compares it against living specimens in a reference garden. (a) Name the analytical tool she used to identify the plant and state what its paired statements are called. (b) Name the aid in which she dried and pressed her specimen, and one detail recorded on its label. (c) Name the reference garden of living plants she visited, and give one real example of such a garden. (d) Besides these, name any two OTHER taxonomical aids and state the use of each. [6 marks]

Ans: (a) A KEY (taxonomic key); its paired contrasting statements are called couplets (each statement of a couplet is a lead). (b) A HERBARIUM; the label records details such as date and place of collection, scientific and common name, family, and collector's name (any one). (c) A BOTANICAL GARDEN; real example — Royal Botanical Gardens, Kew (England) OR Indian Botanical Garden, Howrah. (d) Any two of: MUSEUM — stores preserved plant and animal specimens for study and reference; ZOOLOGICAL PARK (zoo) — keeps living wild animals in protected conditions to study behaviour and aid conservation; FLORA — gives the account of habitat and distribution of plants of an area; MONOGRAPH — gives detailed information on a single taxon; CATALOGUE/MANUAL — an alphabetical record / identification guide of organisms.

★ TOPPER TEMPLATE — 2-3 mark question: 'Why are growth and reproduction not considered defining properties of living organisms? Explain with examples.'

Class 11 annuals — every year; the most common conceptual question of this chapter.

Step 1 [1 mark]	Growth is not defining	State that non-living things also grow: a mountain, boulder, sand dune or crystal increases in mass by ACCRETION (addition from outside). Living things grow by cell division from INSIDE — but adult animals and many organisms stop growing while remaining alive. Hence growth cannot be a universal defining property.
Step 2 [1 mark]	Reproduction is not defining	State that many living organisms do NOT reproduce: sterile worker bees, mules (a sterile hybrid), and infertile individuals are clearly alive yet cannot reproduce. So reproduction is not a property shared by ALL living organisms.
Step 3 [1 mark]	Name the truly defining properties	Conclude that the truly defining properties are METABOLISM (cellular chemical reactions), CELLULAR ORGANISATION, and CONSCIOUSNESS (the ability to sense and respond to the environment — the ultimate defining property). Examiners reward this explicit conclusion.

COMMON LOSS OF MARKS:

- Saying growth is not defining WITHOUT giving the accretion / mountain example (-0.5).
- Forgetting the mule / sterile-worker-bee example for reproduction (-0.5).
- Not naming metabolism + cellular organisation + consciousness as the actual defining properties.

★ TOPPER TEMPLATE — 2-3 mark question: 'State the rules of binomial nomenclature, using *Mangifera indica* as an example.'

Annual + sample papers — near-certain appearance.

Step 1 [1 mark]	Define binomial nomenclature + system author	Binomial nomenclature is the system (given by Carolus Linnaeus) of naming each organism with TWO Latinised words: the first is the GENUS, the second is the specific epithet (SPECIES). Example: <i>Mangifera indica</i> — <i>Mangifera</i> is the genus, <i>indica</i> is the species.
Step 2 [1 mark]	Capitalisation + Latin + script rules	Rules: (i) both words are in Latin / Latinised; (ii) the genus begins with a CAPITAL letter, the species with a small letter; (iii) when printed the name is in ITALICS, when handwritten each word is UNDERLINED SEPARATELY to show Latin origin.
Step 3 [1 mark]	Author citation + governing code	The name of the author who first described the species is written (often abbreviated) after the species name, e.g. <i>Mangifera indica</i> Linn. Botanical names are governed by ICBN (International Code for Botanical Nomenclature) and animal names by ICZN (International Code of Zoological Nomenclature).

COMMON LOSS OF MARKS:

- Capitalising the species epithet (writing '*Mangifera Indica*') — direct deduction.
- Forgetting to mention italics/underlining convention.
- Not naming the governing code (ICBN/ICZN) when the question asks for full rules.

★ TOPPER TEMPLATE — 1-2 mark question: 'Arrange the taxonomic categories in correct ascending/descending order' OR 'Why is species the basic unit of classification?'

Annual + NEET-aligned recall.

Step 1 [1 mark]	Write the hierarchy in correct order	Descending order: Kingdom → Phylum (Division in plants) → Class → Order → Family → Genus → Species. Ascending order is the reverse, starting from Species. Each higher category groups the ranks below it.
Step 2 [1 mark]	Species as the basic, obligate unit	Species is the lowest and BASIC (obligate) unit of classification — a group of individuals with fundamental similarities that can interbreed and are reproductively isolated from other such groups. All higher categories are built upward from species.

COMMON LOSS OF MARKS:

- Writing the hierarchy out of order, or omitting 'Division' as the plant equivalent of Phylum.
- Confusing genus with species as the basic unit.
- Defining species vaguely without the interbreeding / fundamental-similarity criterion.

MARKING SCHEME — GENERAL NOTES

- Scientific name must show correct capitalisation (genus capital, species lowercase) AND italics/separate underlining for full marks.
- Any 'not a defining property' statement must be supported by an example (accretion for growth; mule/sterile bee for reproduction) — bare claim caps at half marks.
- The taxonomic hierarchy must be in the correct order; 'Division' must be acknowledged as the plant equivalent of Phylum where relevant.
- Definitions (species, herbarium, systematics, taxon) are marked on precision — vague paraphrase earns partial credit only.

· For taxonomical-aid questions, naming the aid AND stating its use are each worth marks; one without the other is incomplete.