CLASS IX – SCIENCE PRACTICE PAPER (2026-27)

Step-by-Step Solutions and Marking Scheme

Chapter 12: Patterns in Life – Diversity and Classification | Max. Marks: 40

SECTION A – Objective Questions (1 mark each)

Q1 **[1 mark]**

Arthropods such as insects have jointed appendages (legs). Earthworms are cylindrical, bilaterally symmetrical and segmented, so those features do not separate them.

Answer: (C)

Q2 **[1 mark]**

Genetic material lying free (no membrane-bound nucleus) means X is a prokaryote. Single-celled prokaryotes are placed in kingdom Monera.

Answer: (B)

Q3 **[1 mark]**

Fungal cell walls are made of chitin; plant cell walls are made of cellulose.

Answer: (A)

Q4 **[1 mark]**

Protochordates such as *Amphioxus* have a notochord at least once in their life but no backbone. *Hydra*, starfish and earthworm have no notochord.

Answer: (D)

Q5 **[1 mark]**

Genus name starts with a capital letter and species name is in small letters; the whole name is italicised (underlined when handwritten).

Answer: (B)

Q6 **[1 mark]**

S is a fern (pteridophyte): true roots, stem and leaves, xylem and phloem, no seeds. P is a pine (gymnosperm), Q a flowering plant (angiosperm), R a moss (bryophyte).

Answer: (D)

Q7 **[1 mark]**

Echinoderms (starfish, sea urchin) have a hard internal skeleton of calcium carbonate and no notochord.

Answer: (A)

Q8 **[1 mark]**

Whittaker proposed the five kingdom system in 1969 (1758: Linnaeus, 1866: Haeckel, 1938: Copeland).

Answer: (C)

Q9 **[1 mark]**

Both statements are true. But the lack of seeds is not caused by having xylem and phloem, so R does not explain A.

Answer: (B)

Q10 **[1 mark]**

Assertion is false: yeast (a fungus) and bacteria (Monera) are also unicellular. Reason is true.

Answer: (D)

SECTION B – Very Short Answer Questions (2 marks each)

Q11 **[2 marks]**

(a) (1 mark) Biodiversity is the immense variety of living organisms on the Earth.

(b) (1 mark) Endemic species are found naturally only in a particular region and nowhere else. Example (any one): Nilgiri tahr, lion-tailed macaque, *Nepenthes khasiana*, Neelakurinji.

Q12 **[2 marks]**

(a) (1 mark) Phylum Cnidaria (e.g. *Hydra*); tissue level of organisation.

(b) (1 mark) P is a **tentacle**; it is used to capture prey.

Q13 **[2 marks]**

(a) (1 mark) Annelida. Segmentation gives greater flexibility and more precise control of movement.

(b) (1 mark) Any one: protection, reduces water loss, supports powerful muscles.

Q14 **[2 marks]**

Option A:

(1 mark) A single, universal name avoids confusion between common names used in different regions or languages.

(1 mark) Any two rules: two parts (genus then species); genus starts with a capital letter and species with a small letter; italics when printed, underlined when handwritten.

Option B:

(1 mark) Porifera have cellular level organisation (no tissues or organs); Cnidaria have tissue level organisation.

(1 mark) Porifera get food and oxygen by water flowing through pores; Cnidaria capture prey with tentacles.

SECTION C – Short Answer Questions (3 marks each)

Q15 **[3 marks]**

(i) (1 mark) Slide 1: Monera; slide 2: Protista.

(ii) (1 mark) Slide 1 has no true nucleus (prokaryote). Slide 2 has a well-defined nucleus and is single-celled (eukaryote).

(iii) (1 mark) Any one: *Lactobacillus* / *Rhizobium* are useful; bacteria produce biogas from dung; break down pollutants such as oil, pesticides and sewage; nutrient cycling.

Q16 **[3 marks]**

(i) (1 mark) P: Mammalia; Q: Felidae.

(ii) (1 mark) R: *tigris* (species). Scientific name: *Panthera tigris* (genus capital, species small, italics or underlined).

(iii) (1 mark) The same genus. Lower levels of classification share more common features, as every lower group is part of the group above it.

Q17 **[3 marks]**

Option A (any three, 1 mark each):

• Organisms like *Amoeba*, *Paramecium* and bacteria could not be placed in Plantae or Animalia, so Protista was added.

• Bacteria have no true nucleus, unlike *Amoeba*, so they were placed in a separate kingdom, Monera.

• Fungi do not move like animals and are heterotrophic by absorption, so they were placed in a separate kingdom.

Option B (any three activities, 2 marks; one effect, 1 mark):

• Pollution, deforestation, overuse of resources, climate change.

• Effect: when one species disappears, others that depend on it may also decline and eventually disappear.

SECTION D – Case-Based Questions (4 marks each)

Q18 **[4 marks]**

(i) (1 mark) Cnidaria.

(ii) (1 mark) Nematoda (roundworms). Food enters through the mouth and waste leaves through the anus, so the two functions are separate.

(iii) (1 mark) Food intake and waste removal happen through the same opening, so the digestive process cannot be as efficient or continuous.

(iv) (1 mark) Distinct head–tail and front–back regions allow better coordination of movement and directional movement.

Q19 **[4 marks]**

(i) (1 mark) Old-growth forest; 12 ÷ 4 = **3 times**.

(ii) (1 mark) Hornbills nest only in large, old trees with suitable cavities, and young plantation trees are small and lack cavities.

(iii) (1 mark) (300 ÷ 1300) × 100 = 23.07 ≈ **23%**.

(iv) (1 mark) They would lose nesting sites (and fruit trees), so hornbill numbers would fall and species could become threatened.

SECTION E – Long Answer Question (5 marks)

Q20 **[5 marks]**

Option A:

(i) (1 mark) P: Fungi; Q: Plantae; R: Animalia.

(ii) (1 mark) Mode of nutrition: P is heterotrophic and Q is autotrophic.

(iii) (1 mark) Its cell wall is made of chitin and it is heterotrophic (absorbs nutrients), like other fungi.

(iv) (1 mark) P: chitin; Q: cellulose.

(v) (1 mark) Bacteria are prokaryotes with no membrane-bound nucleus (Monera); *Amoeba* is a eukaryote with a true nucleus (Protista).

Option B:

(i) (1 mark) Thallophyta, Bryophyta, Pteridophyta, Gymnosperm, Angiosperm.

(ii) (1 mark) They live on land but need water for reproduction, because male gametes must swim to reach the female cells.

(iii) (1 mark) Any one: pteridophytes do not produce seeds, gymnosperms do; pteridophytes need water for reproduction, gymnosperms do not.

(iv) (1 mark) Gymnosperm seeds are naked (exposed on cones); angiosperm seeds are enclosed in fruits.

(v) (1 mark) Xylem carries water; phloem carries food.

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