

Andhra Pradesh — Summative Assessment 1 (SA1), 2026-27
Class X — General Science Paper II — Biological Science
Answer Key — Set 2

For: Model Paper 2

Max. Marks: 50

Notes for valuers

- Value points are given; accept answers in the student's own words that cover the same points.
- Diagram questions: neat diagram 2 marks, any four correct labels 2 marks.
- Slogans (Q 5) — any meaningful, relevant slogan gets the mark.

SECTION – I

6 × 1 = 6

1. Haemoglobin
2. Transpiration
3. Pituitary gland
4. B) binary fission
5. e.g. "A pinch of iodised salt keeps goitre away." / "Use iodised salt — for a healthy thyroid and a sharp mind."
6. All F₁ plants are tall (genotype Tt).

SECTION – II

4 × 2 = 8

7. Carbon dioxide — from the air, through stomata.
Water — from the soil, absorbed by roots and carried by xylem.
(Sunlight is the energy source and chlorophyll traps it; minerals like nitrogen come from the soil.)
8. A) Adrenaline
B) Insulin
9. Separation prevents mixing, so oxygen-rich blood goes to the body very efficiently.
Birds and mammals need a lot of energy to keep their body temperature constant, so they need a high supply of oxygen.
10. Vegetative propagation: growing new plants from vegetative parts such as root, stem or leaf.
Advantages (any two): plants that have lost the capacity to produce seeds (banana, orange, rose, jasmine) can be grown; new plants are exactly like the parent; plants bear flowers and fruits earlier.

SECTION – III

5 × 4 = 20

11. Stomach: gastric glands secrete hydrochloric acid (makes medium acidic, kills germs), pepsin (digests proteins) and mucus (protects the stomach lining).
Small intestine: receives bile from the liver (emulsifies fats) and pancreatic juice (trypsin for proteins, lipase for fats, amylase for starch).
Intestinal juice converts proteins to amino acids, carbohydrates to glucose and fats to fatty acids and glycerol.
Villi in the small intestine increase surface area and absorb the digested food into the blood.
12. A) Human respiratory system — labels: nostrils/nasal passage, pharynx, larynx, trachea, bronchi, bronchioles, alveoli, lungs, diaphragm, rib.
12. B) Sectional view of the human heart — labels: right atrium, left atrium, right ventricle, left ventricle, aorta, vena cava, pulmonary artery, pulmonary vein, valves.

- 13. Reflex action:** a sudden, automatic response to a stimulus without conscious thinking. [definition 1, example 1, arc 2]
 Example: pulling the hand away on touching a hot object.
 Reflex arc: Receptor (skin) → Sensory neuron → Relay neuron in spinal cord → Motor neuron → Effector (muscle of the arm).
 Flow diagram of the reflex arc gets credit.
- 14. Placenta:** a special disc-like tissue embedded in the uterine wall that connects the embryo to the mother. It has villi on the embryo's side; on the mother's side are blood spaces surrounding the villi. This gives a large surface area for glucose and oxygen to pass from the mother's blood to the embryo. Waste substances from the embryo pass into the mother's blood through the placenta and are removed.
- 15. Variations** give some individuals features that help them survive if the environment changes.
 Example: In a population of bacteria, if the temperature rises suddenly, most die, but a few variants that can resist heat survive and multiply.
 Example: Red beetles are easily seen and eaten by crows; a green variant hides among leaves and its numbers grow.
 Thus variations help a species survive over a long time and lead to evolution.

SECTION – IV

2 × 8 = 16

- 16. A) Aim:** To observe budding in yeast.
 Materials: yeast granules, sugar, water, conical flask, glass slide, coverslip, microscope.
 Procedure: Dissolve about 10 g sugar in 100 mL water. Add a pinch of yeast and keep the flask in a warm place for 1–2 hours. Put a drop of the culture on a slide, cover with a coverslip and observe under the microscope.
 Observation: Small bulb-like outgrowths (buds) are seen on yeast cells; some buds have their own buds, forming chains.
 Conclusion: Yeast reproduces asexually by budding.
 Marks: materials 1, procedure 3, observation & diagram 3, conclusion 1.
- 16. B) Aim:** To show that roots grow towards water.
 Materials: a trough/tray, dry soil, a porous (unglazed) pot, water, germinating seeds.
 Procedure: Fill the trough with dry soil. Bury the porous pot filled with water in the middle. Sow seeds around it. Keep it for a week, watering only the pot.
 Observation: When the soil is removed carefully, the roots are seen bending towards the porous pot.
 Conclusion: Roots grow towards water — positive hydrotropism.
 Marks: materials 1, procedure 3, observation & diagram 3, conclusion 1.
- 17. A) Ovaries** (a pair): produce eggs (ova) and the hormones estrogen and progesterone. One egg is released every month.
 Oviducts / fallopian tubes: carry the egg from ovary to uterus; fertilisation takes place here.
 Uterus: a bag-like muscular organ where the embryo is implanted and develops.
 Cervix and vagina: the uterus opens into the vagina through the cervix; the vagina receives sperms and forms the birth canal.
 Labelled diagram: ovary, oviduct, funnel, uterus, cervix, vagina.
 Marks: description 5, diagram 3.
- 17. B) Parents:** pure tall (TT) × pure dwarf (tt). Gametes: T and t.
 F₁: all Tt — tall. Dwarfness did not appear.
 F₁ self-pollinated: Tt × Tt → TT, Tt, Tt, tt.

F₂: phenotype 3 tall : 1 dwarf; genotype 1 TT : 2 Tt : 1 tt.

Mendel concluded that the trait seen in F₁ (tall) is dominant and the hidden trait (dwarf) is recessive.

The recessive trait reappears in F₂ when two recessive factors come together.

Marks: cross & Punnett square 4, ratios 2, conclusion 2.

* * *

www.educationobserver.com