

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

For: Model Paper 1

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. Chlorophyll
2. Salivary amylase
3. Synapse
4. C) Cytokinin
5. e.g. "Let her study first — marriage can wait." / "Early marriage harms her health; let her grow and glow."
6. 3 : 1 (tall : dwarf)

SECTION – II

4 × 2 = 8

7. Any two:
 - Aerobic respiration needs oxygen; anaerobic takes place without oxygen.
 - Aerobic gives CO₂ and water; anaerobic gives ethanol + CO₂ (yeast) or lactic acid (muscles).
 - Aerobic releases much more energy; anaerobic releases less.
 - Aerobic is completed in mitochondria; anaerobic occurs in the cytoplasm.
8. A) Phloem
B) Translocation
9. DNA carries the information for making proteins and hence for the body design and characters.
Copying DNA lets the new cell/offspring get the same basic body design; small errors in copying produce variations.
10. Exocrine: it secretes pancreatic juice (trypsin, lipase, amylase) through a duct into the small intestine.
Endocrine: its islets of Langerhans secrete insulin directly into the blood.

SECTION – III

5 × 4 = 20

11. Urine is formed in the nephron in three steps:
 1. Glomerular filtration — blood is filtered in the glomerulus; water, glucose, amino acids, salts and urea enter Bowman's capsule.
 2. Selective reabsorption — in the tubule, useful substances like glucose, amino acids, salts and most of the water are reabsorbed into the blood.
 3. Tubular secretion — some extra wastes are added to the tubule.The remaining fluid is urine, which passes to the collecting duct, ureter and urinary bladder.
12. A) Neuron — labels: dendrites, cell body (cyton), nucleus, axon, nerve ending / axon terminal, (myelin sheath).
12. B) L.S. of flower — labels: sepal, petal, stamen (anther, filament), pistil (stigma, style, ovary, ovule), receptacle.

13. Plants respond by growth movements called tropisms:

[1 each]

- Phototropism — response to light; shoots bend towards light.
- Geotropism — response to gravity; roots grow downwards.
- Hydrotropism — response to water; roots grow towards water.
- Chemotropism — response to chemicals; pollen tube grows towards the ovule.

14. Value points (any four):

- Barrier methods such as condoms prevent pregnancy and also protect against STDs.
- Oral pills change hormonal balance to stop release of eggs (to be used on medical advice).
- Loop or copper-T placed in the uterus (by a doctor).
- Surgical methods — vasectomy in men and tubectomy in women — for couples who do not want more children.
- STDs like gonorrhoea, syphilis and HIV-AIDS spread through unsafe sexual contact; regular check-ups at the PHC are important.
- Spacing children and avoiding early marriage protect the mother's health.

15. Women have XX sex chromosomes; men have XY.

[explanation 2, flow chart 2]

All eggs carry an X chromosome. Sperms are of two types — half carry X, half carry Y.

Flow chart: Mother (XX) → egg X; Father (XY) → sperm X or Y

Egg X + sperm X → XX → girl; Egg X + sperm Y → XY → boy

So the sex of the child depends on which sperm fertilises the egg, i.e. on the father.

SECTION – IV

2 × 8 = 16

16. A) Aim: To show that light is necessary for photosynthesis.

Materials: potted plant, black paper strips, clips, alcohol, beaker, water bath, iodine solution, petri dish.

Procedure: Keep the potted plant in a dark room for 2–3 days to destarch it. Cover part of a leaf on both sides with black paper using clips. Keep the plant in sunlight for a few hours. Pluck the leaf, remove the paper, boil it in water and then in alcohol (on a water bath) to remove chlorophyll. Wash it and add iodine solution.

Observation: The uncovered part turns blue-black; the covered part does not.

Conclusion: Starch was formed only where light fell — light is necessary for photosynthesis.

Marks: aim/materials 2, procedure 3, observation 2, conclusion 1.

16. B) Aim: To show that CO₂ is released during respiration.

Materials: germinating seeds, conical flask, small test tube with KOH solution, cork, bent glass tube, beaker of water, thread.

Procedure: Put germinating seeds in the flask. Hang a small tube of KOH inside. Close the flask with a cork carrying a bent tube whose other end dips in water. Mark the water level and leave for some hours.

Observation: Water rises in the bent tube.

Conclusion: CO₂ released by the seeds is absorbed by KOH, lowering the pressure, so water rises.

Precautions: apparatus must be airtight; use freshly germinated seeds; KOH should not touch the seeds.

Marks: procedure 3, observation 2, conclusion 1, precautions 2.

17. A) Forebrain — the largest part (cerebrum); centre for thinking, memory, intelligence, speech; receives sensory impulses (sight, hearing, smell) and controls voluntary actions. Hypothalamus is also part of it. Midbrain — controls involuntary actions such as change in pupil size and reflex movements of head, neck and trunk.

Hindbrain — Pons: regulates breathing; Medulla oblongata: controls blood pressure, salivation, vomiting; Cerebellum: maintains posture, balance and precision of voluntary movements.
The brain is protected by the cranium and meninges, with cerebrospinal fluid acting as a shock absorber.

Marks: forebrain 3, midbrain 1, hindbrain 3, protection 1 (a labelled diagram may get credit).

17. B) Parents: round-yellow (RRYY) × wrinkled-green (rryy). Gametes: RY and ry.

F₁: all RrYy — round and yellow (round and yellow are dominant).

F₁ self-pollinated: gametes RY, Ry, rY, ry; Punnett square of 16 combinations.

F₂ phenotypes: round-yellow 9, round-green 3, wrinkled-yellow 3, wrinkled-green 1 → 9 : 3 : 3 : 1

Conclusion: the two traits (seed shape and colour) are inherited independently of each other (law of independent assortment); new combinations like round-green appear.

Marks: parents/F₁ 2, Punnett square 3, ratio 1, conclusion 2.

* * *