

ANSWER KEY

MODEL SUMMATIVE ASSESSMENT - TERM II 2025-26

BIOLOGY

Class: X

Time: 1½ Hours

Total Score: 40

PART I

(4 x 1 = 4 Score)

1. (B) Iris

Reason: The Iris contains the pigment melanin, which gives the eye its color, and it regulates the size of the pupil.

2. (B) Tympanum --> Ear ossicles --> Oval window --> Cochlea

Reason: Sound waves vibrate the tympanum, which transmits vibrations to the ear ossicles (Malleus, Incus, Stapes), then to the oval window, and finally to the cochlea.

3. (A) P-2, Q-3, R-1

Reason:

- **(P) Ethylene:** Helps in fruit ripening.
- **(Q) Gibberellin:** Breaks seed dormancy.
- **(R) Cytokinin:** Stimulates cell division.

4. Photopsin

Reason: Rod cells contain the pigment Rhodopsin, while Cone cells contain the pigment Photopsin (also known as Iodopsin).

PART II

(5 x 2 = 10 Score)

5. (A) Eye Defect

- **a) Defect: Short-sightedness (Myopia).** The illustration typically shows the image forming in front of the retina.
- **b) Lens: Concave lens.**

OR

5. (B) Ear and Balance

- **a) Part: Vestibular System** (specifically the Vestibule and Semicircular canals).

- **b) Detection:** The movement of the head causes the **endolymph** inside the canals and vestibule to move, which stimulates the **hair cells**, generating impulses.

6. Taste and Smell

- The sense of taste and smell are interconnected.
- During a cold, the **mucus membrane** in the nose produces thick mucus, which blocks the olfactory receptors. This prevents the detection of smell, making food taste bland as flavor is a combination of taste and smell.

7. Artificial Hormones

- **a) Scientific Name:** Synthetic plant hormones.
- **b) Example:** 2,4-D (Synthetic Auxin) is used as a weedicide.

8. Glucose Regulation

- **a) Hormone:** **Insulin** (produced by Beta cells).
- **b) Function:** It accelerates the entry of glucose into cells and converts excess glucose into **glycogen** in the liver and muscles, thereby lowering blood glucose levels.

9. Cataract

- **a) Condition:** The eye lens becomes **opaque**.
- **b) Treatment:** **Cataract surgery** (Lens replacement surgery).

10. (A) Sensory Organs

- **a) Snakes:** They use **Jacobson's organ** to detect smell.
- **b) Insects:** They have **Ommatidia** (part of compound eyes) for vision.

OR

10. (B) Ant Communication

- **a) Substance:** Pheromones.
- **b) Type:** Trail pheromone.

11. Thymosin

- It helps in the **maturation of T-lymphocytes**, which plays a major role in the body's immune system.

PART III

(5 x 3 = 15 Score)

12. Pupil Reflex

- **a) Change:** The pupil **dilates** (increases in size).

- b) **Muscle Action:** The **radial muscles contract** and the **circular muscles relax** to widen the pupil.

13. (A) Thyroid Disorders

- (i) **Cause of Hypothyroidism:** Reduced secretion of thyroxine.
- (ii) **Condition:** Hyperthyroidism.
- (iii) **Cause of Goitre:** Deficiency of iodine (or disorders of the thyroid gland).

OR

13. (B) Phototropism

- a) **Phenomenon:** Phototropism (or Bending towards light).
- b) **Action of Auxin:** When light comes from one direction, Auxin moves to the **shaded side** of the stem. This stimulates **cell elongation** on the shaded side, causing the stem to bend towards the light.

14. Calcium Regulation

- a) **Hormones:** Calcitonin (Thyroid gland) and Parathormone (Parathyroid gland).
- b) **Lowering Mechanism (Calcitonin):** When calcium levels increase, Calcitonin is secreted. It **deposits excess calcium from blood into bones** and prevents the reabsorption of calcium from the kidneys and intestine back into the blood.

15. Hearing Flowchart

- (a) Tympanum.
- (b) Oval window.
- (c) Auditory nerve.

16. (A) Rod vs. Cone Cells

- a) **Pigment:** Rods have **Rhodopsin**; Cones have **Photopsin**.
- b) **Shape:** Rods are **Cylindrical**; Cones are **Cone-shaped**.
- c) **Function:** Rods help in **dim light** vision (black & white); Cones help in **bright light** and **color vision**.

OR

16. (B) Melatonin

- a) **Gland:** Pineal gland.
- b) **Biological Clock:** It regulates rhythmic body activities like **sleep and wakefulness** at regular intervals.
- c) **Mobile Phones:** The light from screens inhibits melatonin production (which requires darkness), thereby disrupting sleep quality.

17. Diseases

- a) Dwarfism.
 - b) Diabetes Insipidus (caused by a lack of Vasopressin/ADH).
 - c) Acromegaly.
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PART IV

(1 x 4 = 4 Score)

18. (A) Pituitary Gland

- a) **Master Control:** The Hypothalamus produces **Releasing** and **Inhibitory hormones** that control the production of hormones in the Anterior Pituitary, which in turn controls other glands.
- b) **Posterior Hormones:** **Oxytocin** and **Vasopressin (ADH)**.
- c) **Tropic Hormones (Any two):**
 1. **TSH:** Stimulates the Thyroid gland.
 2. **ACTH:** Stimulates the Adrenal cortex.
 3. **GTH:** Stimulates the activity of ovaries and testes.
 4. **Somatotropin:** Helps in body growth.

OR

18. (B) Adrenal Gland

- a) **Parts:** **Cortex** (outer) and **Medulla** (inner).
 - b) **Secretion:** The **Medulla** secretes Epinephrine and Norepinephrine.
 - c) **Emergency Action:** These hormones increase **heart rate**, **blood pressure**, and **blood glucose levels**. They divert blood flow to the heart and muscles to prepare the body for "fight or flight".
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