Plant Growth and Development

Assertion Reason Questions

Given below are two statements labelled as Assertion (A) and Reason (R). Select the most appropriate answer from the options given below:

(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true and R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

1. Growth is a universal and fundamental process of life on earth. The analysis and modelling of plant growth has therefore been a particular concern in plant science as well as in production biology including forestry, agriculture and fishery to name but a few. This research has the important objective to identify growth patterns in response to environmental factors or treatments.

Assertion (A): Plant shows unlimited growth throughout their life.
Reason (R): Meristem in plants can divide continuously throughout the life of the plant.

Ans. (a) Both A and R are true and R is the correct explanation of A.
Explanation: Plants have meristems that divide continuously and this is the main reason behind the unlimited plant growth.

2. Assertion (A): Arithmetic growth occurs at a constant rate.
Reason (R): In Arithmetic growth, division occurs in every cell with all the daughter cells growing and dividing again.

Ans. (c) A is true but R is false.
Explanation: In Arithmetic growth, only one daughter cell divides continuously whereas other cells undergo differentiation and become mature or permanent. The increase in growth occurs in the arithmetic progression at a constant rate.

3. Assertion (A): Water is an important factor for growth in plants.
Reason (R): Water maintains the turgidity of growing cells and provides a medium for enzymatic activities.

Ans. (a) Both A and R are true and R is the correct explanation of A.
Explanation: Water is an important factor for growth in plants because it serves a major role in turgidity and also acts as a medium for enzymatic activities.

4. Assertion (A): The elongation phase has the thickest cell wall.
Reason (R): Cell wall thickens due to deposition of materials on them.

Ans. (d) A is false but R is true.
Explanation: Elongation phase has intermediate cell wall thickness.

5. Assertion (A): Plants respond to the environment or phases of life to form different kinds of structures.
Reason (R): This phenomenon is called plasticity.

Ans. (a) Both A and R are true and R is the correct explanation of A.
Explanation: Plasticity is the ability to change under the influence of internal or external stimuli. Due to plasticity, plants follow different pathways to respond to the environment or phases of life to form different structures. For example, heterophylly in cotton.

6. Assertion (A): Auxins were isolated from human urine.
Reason (R): Auxins are sometimes used as herbicides.

Ans. (b) Both A and R are true and R is not the correct explanation of A.
Explanation: Both the statements are correct as auxins were isolated from human urine and they are also used as herbicides. But (R) is not the explanation of (A).