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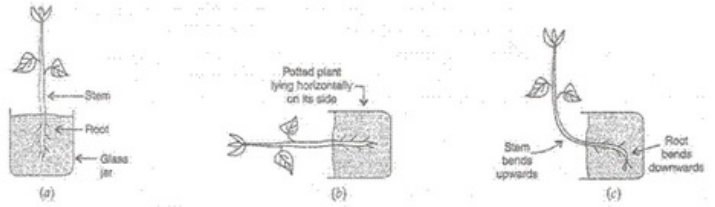
Solution 28
(a) Figure
(b) Geotropism.
Solution 29
(a) Abscisic Acid
(b) Cytokinin
(c) Auxin
(d) Abscisic Acid
Solution 30
(a) Stem
(b) Root
(c) Stem
(d) Root
Solution 31
The folding of leaves of a sensitive plant is not a case of tropism (like thigmotropism) because in this case the direction of movement of leaves does not depend on the direction of stimulus (touch).
Solution 32
The closing of a dandelion flower at dusk (when it gets dark) is not a tropism because the direction of movement of petals of dandelion flower does not depend on the direction of stimulus (light).
Solution 33
(a) A growth movement ofa plant part in response to an external stimulus in which the direction of stimulus determines the direction of response is called tropism. Example - The bending of plant stem towards light is an example of positive phototropism.
(b) Different types of tropisms are:
(i) Phototropism - The movement of a plant part in response to light is called phototropism. Its stimulus is light.
(ii) Geotropism - The movement of a plant part in response to gravity is called geotropism. Its stimulus is gravity.
(iii) Chemotropism - The movement of a plant part in response to a chemical stimulus is called chemotropism. Its stimulus is chemical.
(iv) Hydrotropism - The movement of a plant part in response to a water stimulus is called hydrotropism. Its stimulus is water.
(v) Thigmotropism - The movement of a plant part in response to a touch stimulus is called thigmotropism. Its stimulus is touch.
(c)
Tropisms:
1. These movements are always in the direction of the stimulus.
2. These movements are slow.
3. These movements are exhibited by all parts of a plant.
For example, movement of shoot towards the light and not towards
Nasties:
1. These movements are neither away nor towards the stimulus.
2. These movements are fast.
3. These movements are exhibited by the flat organs (like leaves and petals of flowers) of a plant.
For example, the bending and dropping of leaves in 'Touch-me-not' plant.
Solution 34
(a) Phototropism - The movement of a plant part in response to

light is called phototropism. Example -Stem bends towards the light is positive phototropism.
(b) Phototropism in a plant stem - The bending of a plant stem towards light is an example of phototropism. The plant stem responds to light and bends towards it due to the action of auxin hormone. The auxin hormone is present at the tip of the stem of the growing plant. Auxin prefers to stay in shade away from light so when sunlight falls on the stem from one side, it gets concentrated on the opposite side. Due to more auxin, the shady side of the stem grows to be longer than the side of stem which is facing light, and makes the stem bend towards light.

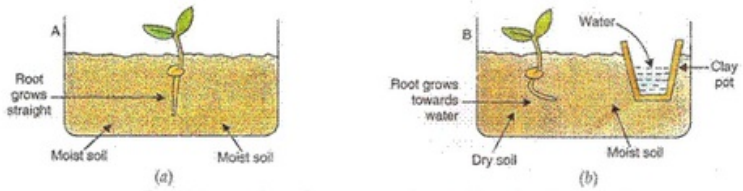
Diagrams to explain the bending of a plant stem (or shoot) towards light by the action of 'auxin' hormone.

(c) The movement of a plant part towards light is called positive phototropism. Example ? the stem of the growing bends towards light. The movement of a plant part away from light is called negative phototropism. Example ? The roots of a plant move away from light.
Solution 35
(a) The movement of plant part in response to gravity is called geotropism. Example - Roots grow towards gravity.
(b) If the plant part moves towards the direction of gravity, it is called positive geotropism. Example - Roots. If the plant part moves against the direction of the gravity it is negative geotropism. Example - Stem



Experiment to show the response of a plant to gravity (geotropism).

(c) Tendrils.
Solution 36
(a) The plants do not have a nervous system but they can sense things in the presence of stimuli such as light, touch, water etc. and respond to them by the action of hormones. Thus, the plants coordinate their behavior against environmental behavior by using organic chemicals called hormones. This is called chemical coordination. The hormones in plants coordinate their behavior by affecting the growth of a part of the plant resulting in the movement of that plant part in response to a stimulus. The control and coordination in animals takes place by both nervous system and hormones.
(b)
(i) Light - Phototropism.
(ii) Gravity - Geotropism.
(iii) Chemical - Chemotropism.
(iv) Water - Hydrotropism.
(v) Touch - Thigmotropism.
(c) The movement of a plant part in response to water is called hydrotropism. Example: The roots of a plant always go towards water, this is positive hydrotropism.



Experiment to show the response of a plant to water (hydrotropism).

Solution 37

(a) The growth of a plant part in response to a stimulus is called positive tropism and if the growth of a plant part is away from the stimulus, then it is called negative tropism.Example: The roots of a plant go towards earth in response to gravity is an example of positive geotropism whereas stem grows away from earth against gravity is an example of negative geotropism.

(b) The directional growth movement of a plant part in response to the touch of an object is called thigmotropism.Example: Tendrils grow towards any support which they happen to touch and wind around it.

(c)

Thigmotropism	Thimonasty
The directional growth movement of a plant part in response to the touch of an object is called thigmotropism. Example: Tendrils.	The non-directional movement of a plant part in response to the touch of an object is called thigmonasty. Example: Mimosa pudica.

Tendrils grow towards a stimulus hence it is a directional movement which shows that it is a case of thigmotropism whereas, the folding of leaves in mimosa plant does not depend on the direction of stimulus (touch) which shows that it is an example of thigmonasty.

********** END **********