Q. State the role of phytohormones in the phototropic curvature of plants.

Ans. The phytohormone auxin also called Indole acetic acid (IAA) controls the tropic movements in plants. The phototropic movement is the curvature of the plant organs in response to unilateral illumination and is caused by auxin. The unequal distribution of auxin on two sides of stimulated stem is due to light induced lateral translocation of auxin due to light, auxin formation is restricted on the lighted side and it increases in the shaded side. This causes more cell division on the shaded side than the lighted side thereby bending of stem towards the direction of light takes place.

Q. State the role phytohormone in the geotropic curvature of plant.

Ans. The phytohormone auxin also called Indole acetic acid (IAA) controls the tropic movements in plants. The geotropic movement is the curvature of of plant organs in response to the direction of force of gravity. The phytohormone auxin also influences the geotropic movement which is caused due to unequal distribution of auxin. In horizontal organ, auxin concentration is more on the lower side than on the upper side. Roots being more effective on lesser auxin concentration causes greater growth on upper side of the root resulting in the downward curvature of roots.

iv) Example	Movements of algae, bacteria towards weak light	Movement of shoots towards light, mov. of roots away from light.	Opening of the petals of lotus, lily etc with sun and closing with sun

30) Describe an experiment on phototropism.

Ans:- Evidence — A potted plant kept near open window bends towards the source of light.

Experiment on phototropism:

i) Materials required - Potted seedling, table.

ii) Procedure — A potted seedling is kept near the open window through which adequate sunlight fall on the seedling.

iii) Observation - After some days we notice that the stem move towards the source of light i.e., towards the open window.

iv) Inference — We can thus say that the stem, moving towards the direction of the external stimulus i.e., light, is positively phototropic or in other words, positively heliotropic. The leaves being in a transverse position towards the external stimulus is transversely phototropic.

31) Describe an experiment on geotropism.

Ans:- i) Materials required — Few germinating seeds, a moist substance (saw...

ii) Procedure — The germinating seeds are placed in a horizontal position over the moist substance (wet saw dust) and kept in a dark chamber in order to avoid the influence of light.

iii) Observation - After some days it will be seen that the tip of the radicle bends downwards showing positive geotropism of root, and the plumule moves in a direction vertically upwards showing negative geotropism of stem.

iv) Inference - Stem bending in the direction away from the external stimulus (gravitational pull) shows negative geotropism, whereas the root shows positive geotropism by moving towards the external stimulus.

32) Describe an experiment on hydrotropism

Ans:- The roots of the seedlings are positively hydrotropic which was demonstrated by keeping them on moist hanging sieve contai... containing moist saw dust. Then it has been observed that, the roots after passing through the holes of sieve, bend and sp... on the moist outer surface of the container in search of water instead of going downwards.

33) State the ... convecture ...

Ans: The phy... (IAA) con... movement... to unilat... unequal ... stem ... of auxi... the ligh... causes ... lighte... direc...

33) State ... of p...

Th... ac... ge... in...

tongue in the petiolus, the swollen basal region of the leaflet containing sensitive cells.

Q5) what is chemonastic movement?

Ans: The nastic movement of plant organs induced by change in the intensity of the chemical substance is called chemonastic movement or chemonasty.

Eg: i) curving of tentacles of the insectivorous plant drosera in response to soluble portion of the insect body when placed at the center of the leaf.

ii) Movement of tendril accompanying from clockwise in insectivorous plant like drosera

Q6) state the differences among tactic, tropic and nastic movements

Ans:-

Point of diff	Tactic	Tropic	Nastic
i) change of place	Plants undergo change of place. It is an induced plant movement of locomotion.	Plants do not change their place. It is an induced plant movement of curvature	Plants do not change their place. It is an induced plant movement of curvature
ii) Factor	It is dependent on the intensity as well as the direction of the stimulus	It ~~is~~ depends on the direction of the stimulus and does not depend on the intensity of the stimulus	It depends on the intensity of the stimulus and is not dependent on the direction of the stimulus. It takes place in a pre determined direction and the stimulus is different.
iii) Types	The diff. types are Phototactic chemotactic, Thermotactic	The diff. types are phototropic, Geotropic, Chemotropic Thigmotropic, Hydrotropic.	The diff. types are photonastic, Chemonastic, Nyctinastic, Thermonastic, seismonastic.

stimulus in a pre-determined direction and the stimulus remains diffused in nature.

Eg: The opening of petals of lotus with sunrise and closing with sunset.

The diff. types of nastic movents are i)b Photonastic ii)b Thermonastic iii)b Nictinastic iv)b seismnastic v)b Chemonastic

2)b what is photonastic movement?

Ans:- The nastic movement induced by the change of in the light intensity is called photonastic movement or photonasty. Pg 167 Eg: i)b water lily, sun flower, poppy open at sunrise and close at sunset. ii)b Flowers of night queen (cestrum nocturnum) open at night.

2)b what is thermonastic movement

Ans:- The nastic movement of the plant organs induced by the variation in the degree of temp. is called thermonastic movement or thermonasty

Eg: i)b Pg 18 Flowers like Tulip, Cereus open at high temp. but close with fall of temp.

2)b what is nictinastic movement?

Ans:- The nastic movement of plant organs due to change of intensity of both light and temp which act simultaneously is called nictinastic movement or nictinasty. Oxalis

eg: Leaves of Acacia, Bauhinia, Mimosa pudica etc. and opening and closing of flowers of cactus and tobacco are the examples of nictinastic movement.

2)b what is ~~chemonasty~~ seismonasty?

Ans:- The nastic movement of plant organs in response to the intensity of mechanical stimuli such as contact with foreign body, pressure, shock, shaking is called seismonastic movement or seismonasty. The extent of seismonastic movement depends upon the intensity of the stimulus, the vigour and

negative tactic movement and negative geotropic movement.

19b what type of movement is exhibited by the roots of a plant?

Ans: The roots of a plant shows negative phototropic movement, positive hydrotropic movement and positive geotropic movement.

19b What is chemotropism?

Ans: The tropic movement of plant organs in response to the stimulation of a chemical substance is called chemotropic movement or chemotropism.

Eg: Movement of a pollen tube towards the chemical secreted by the of the ovule

19b What is thigmotropic or haptotropic movement?

Ans: The tropic movement of the plant organs in response to contact or touch with a foreign body is called the thigmotropic movement or haptotropic movement.

Eg: coiling of a tendril around a support

20b what type of movement is shown by coiling tendril?

Ans: Nutation

21b what type of movement is shown by the tendril coiling around a support

Ans: Haptotropic or Thigmotropic movement.

22b what is nastic movement?

Ans: It is an induced plant movement of convex when the direction of the response of the plant organs bears no definite relation to the direction of the external stimulus and the organs behave indifferently, then the plant movement is called nastic movement. The movement of the plant organs takes place according to the intensity of the

negative hydrotropic movement and negative geotropic movement.

1a) what type of movement is exhibited by the roots of a plant?

Ans: The roots of a plant show negative hydrotropic movement, positive hydrotropic movement and positive geotropic movement.

1b) What is chemotropism?

Ans: The tropic movement of plant organs in response to the stimulation of a chemical substance is called chemotropic movement or chemotropism.

eg: * Movement of a pollen tube towards the chemical secreted by the of the ovule.

1b) what is thigmotropic or haptotropic movement?

Ans: The tropic movement of the plant organs in response to contact or touch with a foreign body is called the thigmotropic movement or haptotropic movement.

eg: coiling of a tendril on around a support.

2a) what type of movement is shown by growing tendril?

Ans: Nutation.

2b) what type of movement is shown by the tendril coiling around a support

Ans: Haptotropic or Thigmotropic movement.

2b) what is nastic movement?

Ans: It is an induced plant movement of convex. When the direction of the response of the plant organs bears no definite relation to the direction of the external stimulus and the organs behave indifferently, then the plant movement is called nastic movement. The movement of the plant organs takes place according to the intensity of the

13) what is photo tropic movement?

Ans:- The tropic movement of plant organs in response to the source of light is called photo tropic movement or heliotropic movement.

Eg: i) The shoot of a plant grows towards the source of light and is positively photo tropic.

ii) The root of the plant grows away from the source of light and is negetively photo tropic.

iii) The leafs remain at right angle to the source of light and are transversely photo tropic.

14) what is hydro tropic movement?

Ans:- The tropic movement of plant organs in response to the source of water is called hydro tropic movement.

Eg: i) The roots grow towards the source of water and are positively hydro tropic.

ii) The shoots grow away from the source of water and are negetively hydro tropic.

15) what is geo tropic movement?

Ans:- The tropic movement of plant organs in response to the direction of the force of gravity is known as geotropic movement or geotropism.

Eg: i) The roots of a plant grow towards the force of gravity and are positively geotropic.

ii) The shoots of a plant ~~from a~~ move away from the force of gravity and are negetively geotropic

iii) The lateral roots and branches grow at right angle to the force of gravity and are transversely geotropic

16) (objective) what type of movement is exibited by the shoot of the plants?

9b what is thermotactic movement?

Ans:- The tactic movement in an organism due to the change of temperature is called thermotactic movement.

Eg: i) If hot water is dropped in the center of a bacterial colony the cells move apart showing negative thermotactic movement.

ii) If cold water is dropped similarly, the bacterial cells move towards it showing positive thermotactic movement.

iii) Movement of protoplasm at a higher rate within the cell due to the rise of temperature only.

10b what is movement of growth?

Ans:- This is a permanent spontaneous movement of curvature in plants. It is also known as nutation. When plant organs like stem and tendril grow in length, their tips follow a spiral course.

11b what is movement of variation?

Ans:- This is a temporary spontaneous movement of curvature in plants.

Eg: The leaflets of tegora plant show this movement. The two lateral leaflets exibits up and down movement at day time due to variation in the turgor pressure in the cells of the pulvinus of the leaflet.

12b what is tropic movement?

Ans:- It is an induced plant movement of curvature. When the direction of response of the plant organs bears a definite relation with the other towards or away from the external stimulus then the plant movement is called tropic movement or tropism.

Eg: Movement of stem towards light and movement of roots away from light.

The diff. types of tropic movement are :- i) Phototropic or Heliotropic movement. ii) Hydrotropic movemt iii) Geotropic movemt. iv) Chemotropic movement v) Haptotropic or Thigmotropic movement.

movement or taxism. It is of three types :- i) photo tactic
ii) chemo tactic
iii) Thermo tactic.

Eg: Movement of algae towards weak light.

Q) what is photo tactic movement or photo taxism?

Ans:- The tactic movement of the organism induced by light is called photo tactic movement or photo taxism.

Eg: i) Zoospores of Ulothix and the entire body of Chlamydomonas move away from intense light showing negative photo tactic movement.

ii) However, they move towards weak light thereby showing positive photo tactic movement.

iii) Movement of algae and bacteria towards weak light.

Q) what is chemo tactic movement?

Ans:- The tactic movement ~~indu~~ of the organism induced by some chemical substances is called chemo tactic movement.

Eg: i) In moss, cane-sugar is secreated by the female sex organs called archeogonium to induce the movement of antherozoids towards it.

ii) In fern, malic acid is secreated by similarly to attract the antherozoids.

These are positive chemo tactic movement.

iii) If a little acid is dropped in the center of a bacterial colony the bacteria move away from the acid. This is negative chemotactic movement.

4) What is celeary movement?

Ans:- It is a spontaneous movement of loco motion in plants. The protoplasm moves with the help of celea in some algae and fungi which is called celeary movement.

Eg: Zoospores of algae and fungi.

5) What is amaeboid movement?

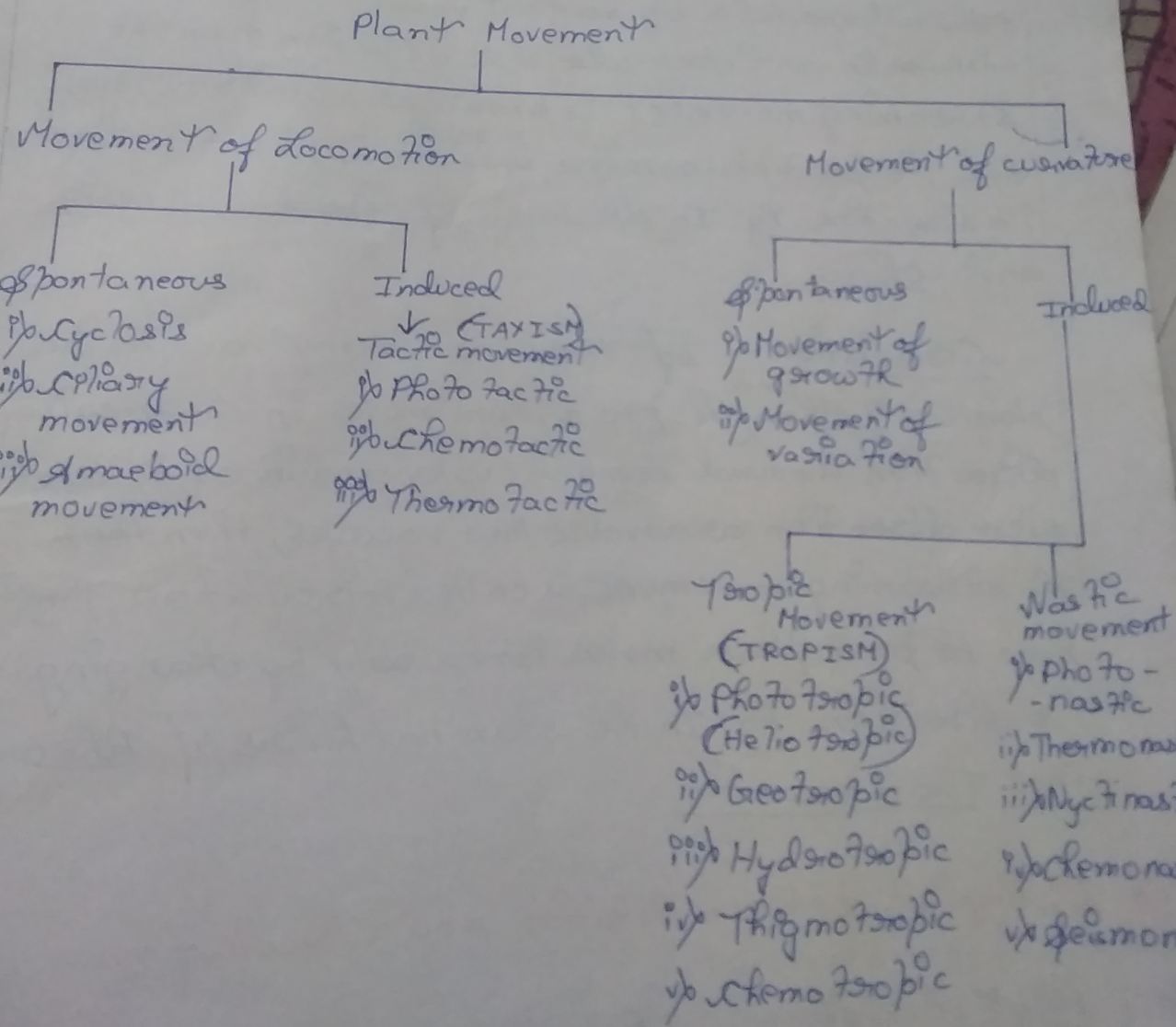
Ans:- It is a spontaneous movement of locomotion in plants. In some algae, the protoplasm moves with the help of pseudopodia which is called amaeboid movement.

Eg: Myxomycetes group of algae.

6) What is tactic movement?

Ans:- It is an induced plant locomotion of the organism. The free type of plant movement induced by some external stimuli like light, chemical, temperature etc. is called ta

Plant movement



4) Name two plants that can show locomotion.

Ans: Chlamydomonas and Volvox.

5) Name two animals that do not show locomotion.

Ans:- Sponge and Corals.

6) What are the factors of movement and locomotion?

Ans: The purposes of movement and locomotion are:-

(i) To acquire food - Almost all plant move towards the source of water for absorption. Some lower groups of plants can move place to place in search of food. Animals can not prepare their own food and hence, the move from place to place in search of food.

(ii) Shelter - In order to live a normal life, and to perform all the ~~physical~~ living functions properly a suitable shelter is necessary for all plant and animals. Hence, animals have to move from one place to the other.

(iii) Protection - Animals have to undergo locomotion in order to protect themselves from danger.

(iv) Reproduction - Locomotion of animals is necessary for reproduction.

(v) Search of suitable environment - In order to get sufficient amount of light, air and temperature, parts of the plant body move. Animals have to undergo locomotion in search of a suitable environment.

The purpose of movement in case of plant is also to get sufficient ammount of water and to check loss of water, for pollination, reproduction etc.

Movement and locomotion

1) What is movement?

Ans:- The process by means of which the living organism is partly or wholly or due to the influence of the stimuli can move any part of their body is called movement

Eg.: Movement is usually seen in higher plants.

2) What is locomotion?

Ans:- The process by means of which the living organism can change their position entirely from one place to the other due to the voluntary movement of their locomotory organs is called locomotion.

Eg.: Locomotion is commonly seen in animals.

3) Distinguish between movement and locomotion.

Ans:-

Point of difference	Movement	Locomotion
i) Change of place	Involvement of change of place do not occur.	Involvement of change of place occurs.
ii) Whole organism	Change of place of the whole organism do not takes place	Change of place of the whole organism takes place
iii) Parts of the organism	Only parts of the organism changes its place	The parts of the organism do not involve change of place
iv) Example	Higher plants mainly exibit movement (except Chlamydomonas and Volvox)	Animals mainly exibit locomotion (except sponge and Corals)