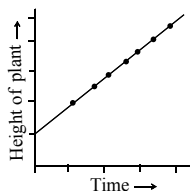## Topic :- Plant Growth & Development

1 **(d)**

Both (b) and (c).

Arithmetic Growth Rate The expression of arithmetic growth is exemplified by roots (or organ) elongating at constant rate. On plotting the length of an organ against time, a linear curve is obtained. Mathematically it is expressed as

Constant linear growth, a plot of length L against time

$L_t = L_0 + rt$

L_t = Length of time 't'

L_0 = Length of time to

r = Growth rate or elongation per unit time

2 **(d)**

Ethepton hastens fruit ripening in tomatoes and apples and accelerates abscission in flowers and fruits. It promotes female flowers in cucumbers thereby increasing the yield

3 **(a)**

Gibberellins (Tabuta; 1935) are weakly **acidic** plant growth hormones.

4 **(a)**

Auxin (derived from Greek work *auxin*, which means to grow) was first isolated from human urine. Kogl and Heagen Smith (1931) isolated three chemicals from human urine and named them as auxin

5 **(c)**

Abscisic acid (ABA) inhibits synthesis of RNA and proteins. It has been shown that ABA regulate the expression of certain genes during seed maturation and certain stress condition such as heat shock, adaptation to low temperature and tolerance.

6 **(d)**

Gibberellins are the plants hormone causing light inhibited stem growth, this shows that light lowers the level of endogenous gibberellins and stem growth, while in drak it reverses. Gibberellins also produce some other physiological effects on plants like elongation of internodes and the stem, induce seed germination, breaking dormancy, induce perthenocarpy

and maleness in plants, etc.

7 (a)
Seismonastic movement is a type of nastic movement. It comes in response of touch and this phenomenon is known as seismonasty, *e.g.,* leaflets of *Mimosa pudica.*

The nastic movements in response to light, chemical, temperature, etc, are called as photonastic, chemonastic and thermonastic movements respectively.

8 (d)
Vernalisation made plant of flower by shortening the vegetative or juveline growth of the plant

9 (c)
Ability of the plants to produce new plant material is called efficiency index.
The exponential growth or phase of geometrical growth of the plant can be expressed as
$W_1 = W_0\, e^{rt}$, where
$W_0 =$ Initial size at the beginning of the period
$W_1 =$ Final size at the beginning of the period
$r =$ Growth rate
$t =$ Time of growth
$e =$ Base of natural logarithms
Here, the relative growth rate is also the measure of the ability of the plant to produce new plant material, which is referred to as efficiency index. Hence, the final size, W_1 depends on the initial size, W_0

10 (c)
Day netural plants can flower in all possible photoperiods. Such plants can blossom throughout the year, *e.g.,* cucumber, cotton, sunflower, tomato, some varieties of pea, etc.

11 (c)
The movement which occurs due to difference in the rate of growth on two opposite sides of a plant organ is called **nastic movement**. When movement occurs due to faster growth of the upper surface of organ as compare to lower it is called **epinasty**, e.g., **opening of flower**.

12 (a)
In the given graphs, only 'A' shows the linear growth curve.
Arithmetic Growth Rate The expression of arithmetic growth is exemplified by roots (or organ) elongating at constant rate. On plotting the length of an organ against time, a linear curve is obtained. Mathematically it is expressed as
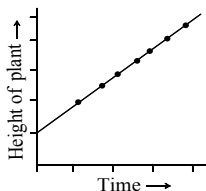
Constant linear growth, a plot of length L against time
$L_t = L_0 + rt$

L_t = Length of time 't'

L_0 = Length of time to

r = Growth rate or elongation per unit time

13 **(d)**

Injury induced growth movement is called **traumatropism**. Growth away from injured side is negative traumatropism and towards injured side accounts to be positive traumatropism.

14 **(c)**

Auxins concentration increase in shaded area (opposite side of light). Increased auxin concentrations are stimulatory for shoot growth so, shaded side shows more growth than lighed side. Thus, bending of shoot takes place towards the lighted side.

15 **(a)**

Development is a term that includes all changes that an organism goes through during its life cycle from germination of the seed to senescence. Diagrammatic representation of the sequence of processes, which constitutes the development of a cell of a higher plant is given in figure. It is also applicable to tissues/organs

Sequence of the development process in a plant cell
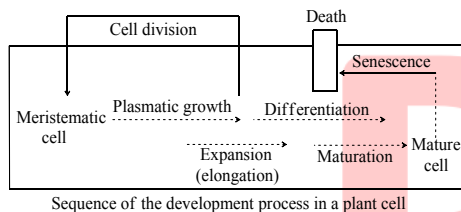
16 **(a)**

Phytochrome is a pigment universally present in green flowering plants responsible for photomorphogenic changes and developmental processes.

17 **(d)**

During mid 1960s, three independent researches reported the purification and chemical characterisation of three different kind of inhibitors as inhibitor B, abscission II and dormin. Later, three were proved chemically identical. It was named Abscisic Acid (ABA)

18 **(a)**

Florigen is hypothetical hormone, which has not yet een extracted. It is produced by the joint activity of leaves and growing points. It is produced in response to specific photoperiodicity. It induces only flowering. Growth is neither inhibited nor stimulated by this hormone.

19 **(d)**

Auxin elongates the cells present just below the apical part of shoot. It also do cell division and cell differentiation

20 **(b)**

Paratonic movements are produced in response to some external stimulus. These are said to be positive if directed towards the stimulus and negative if away from the stimulus. In pitcher plant, stimulus is provided by the insect.

ANSWER-KEY										
Q.	1	2	3	4	5	6	7	8	9	10
A.	D	D	A	A	C	D	A	D	C	C
Q.	11	12	13	14	15	16	17	18	19	20
A.	C	A	D	C	A	A	D	A	D	B