3.11. PLANTS GROWTHAND ITS REGULATORS

SYNOPSIS

Introduction and Growth

- 1. Growth is a fundamental character of living organisms.
- 2. Growth is a cumulative result of cell division, cell elongation and differentiation.
- 3. In the life history of a plant two types of Growth can be seen.
 - a) Vegetative growth and b) Reproductive growth
- 4. Flower initiation is based on Photoperiod and Vernalization
- 5. Growth is defined as irreversible, permanent increase in size accompanied by change in weight.

1. GROWTH CURVE

- 1. Growth curve resembles sigmoid curve.
- 2. First phase of growth is Lag phase
- 3. During Lagphase Growth is steady and slow.
- 4. Lagphase is otherwise known as formative phase
- 5. Second phase of Growth is Log phase
- 6. This phase represents maximum growth or rapid growth
- 7. This phase is otherwise known as Logarithimic phase or exponential phase.
- 8. Third phase of growth is known as Senescent phase.
- 9. This phase exhibits decline in growth activity.
- 10. This phase corresponds to maturity of cells.
- 11. Total period of time required for all the three phases is known as Grand Period of Growth.

Introduction to Growth Regulators

- Plant growth is a co-ordinated process resulting from the interaction of light, CO₂, Carbondioxide, oxygen etc external factors and nutrients and photosynthetic internal factors
- Julius Sachs (1880) suggested the presence of chemical messengers, which control growth directly.
- **Starling** (1905) called the chemical messengers controlling growth as hormones.
- The hormones of plants are called Phytohormones.
- An organic substance sythesized in one part of the plant and moves to the site of action, where in low concentration it causes physiological response is called Phytohormone.
- Growth regulators are either growth promoters or growth inhibitors.
- Auxins, Gibberllins and Cytokinins are growth promotors.
- Abscisic acid is a growth inhibitor.
- Ethylene is a fruit ripening hormone

UNIT - III :: PLANT GROWTH AND ITS REGULATORS

2. AUXINS

- The term 'auxin' is derived from Greek word "Auxen" which means to increase.
- Julius von sachs (1880) showed organ forming substances are produced in leaves and translocated in a downward manner.
- Charles Darwin and Francis Darwin proved the ideas of Sachs through their experiments on phototrophic movements in plants.
- They published their results in their book titled "The power of movements in plants".
- They found that Coleoptile of canary grass bends towards light when exposed to unilateral light.
- Boyson Jenson (1910) demonstrated that Coleoptile tip bends towards unilateral light, even if a gelatin block is placed between Coleoptile cap and stump.
- **Paal** (1918) proved that assymetric placement of Coleoptile cap on stump causes bending of Coleoptile even in dark.
- **F.W. Went** discovered auxins. He collected the substance on Agar blocks.
- He developed the first auxin bioassay namely "Avena curvature test".
- Use of biological material to test the activity of a substance is called "**Bioassay**".
- 1 µg of Auxin is present in 10,000 coleoptile tips.
- IAA (Indole-3-aceticacid) and 4-chloro IAA and PAA are natural auxins.
- IAA is the most active and abundant type of natural auxin.
- IBA, NAA, 2,4-D, 2,4,5-T are synthetic auxins.
- Auxins are synthesized at shoot apex and to certain extent in root apex.
- Auxin movement is **bidirectional.** The acropetalous and basipetalous movement occur in **1** : **3** ratio.
- **Tryptophan** is the precursor of IAA synthesis. Zinc is needed for synthesis of Tryptophan.
- The molecular structure of IAA has an indole ring with nitrogen and a side chain having carboxylic group.

Physiological effects of auxins

- Auxins induce growth in excised stem and Coleoptile by cell elongation.
- They induce differentiation of xylem.
- IAA induces root initiation on stem cuttings. Synthetic auxins are more powerful root initiating hormones (IBA,NAA)
- Phototropic and geotropic movements induced by auxins are explained by Cholodney Went theory.

- According to this theory auxins at same concentration act differently on different parts.
- High concentration of auxin promotes stem growth.
- High concentration of auxin inhibits root growth.
- The bending of Coleoptile towards light is due to more auxin on dark side and destruction of auxin on illuminated side.
- Auxins induce positive geotropism in root and negative geotropism in stem.
- Positive geotropism in root is due to inhibition of growth due to accumulation of auxin on lower side.
- Negative geotropism in stem is due to more growth on lower side of stem.
- Inhibition of growth of lateral buds by apical bud is called **apical dominance**.
- Thimann & Skoog explained apical dominance is due to high Auxin concentration in lateral buds..
- Development of fruit without fertilization is called parthenocarpy.
- Auxins induce parthenocarpy. This was discovered in Orchids.
- Auxins induce female flower formation in Cucurbits and enhance yield.

Role of auxins in Agriculture and Horticulture

- IBA, NAA and IAA at low concentration are applied to induce root formation in stem cuttings. Among these IBA is most powerful inducer of roots.
- 2,4-D, 2,4,5-T are weed killers or herbicides. They kill broad leaved dicot weeds.

Gibberellins

- Gibberellins were discovered in rice plants infected by Gibberellina fujikuri, causing Bakanae or foolish seedling disease.
- Sawada reported that Bakanae disease is caused by the secretion of a fungus called **Gibberella fujikouroi.**
- *Fusarium moniliformae* is the asexual stage of Gibberella fujikuroi (sexual stage).
- Kurasawa demonstrated that the disease is caused by sterile filterates of the fungal extracts.
- Yabuta and Sumiki crystallised gibberellic acid. They are diterpenoid substances synthesized from Acetyl CoA.
- Gene mutation in Pea and Maize etc. results in blockage of Gibberellin synthesis and leads to genetic dwarfism.
- Externally applied gibberellins remove genetic dwarfism.

- L.G. Paleg (1950) demonstrated the effect of gibberellins in inducing seed germination.
- Gibberellins synthesized in embryo move to aleurone layer and induce the formation of αamylase enzyme which hydrolyses starch into sugars.
- Hyper-elongation of stem before flowering is called Bolting.
- Gibberllins induce Bolting and flowering in rosette plants and several other plants.
- Like auxins gibberellins induce parthenocarpy. Eg. Tomato, Grapes etc.
- Unlike auxins gibberellins promote male flower formation in Cucurbits and Cannabis.
- In Grapes more number of bunches, more fruits in a bunch, large and seedless fruits with more glucose are produced by the application of gibberllins.
- Gibberllins reduce the susceptibility of grapes to fungal diseases, enhance sugar cane yield, increase seed production in conifers and help in the production of superior quality malt in barley.

Cytokinins

- Skoog and Miller isolated a compound inducing cell division from Yeast. They used the name 'Kinetin' for the compound formed by partial breakdown of Herring sperm DNA, which induces cell division.
- Miller and Letham isolated naturally occurring cytokinin from milk stage endosperm in Maize and called it "Zeatin".
- Benzyl amino purine, Benzyl adenine are synthetic Cytokinins.
- Induction of cell division is the major function of Cytokinins.
- Cytokinins induce cell expansion in leaf discs of Soyabeans and cotyledons of Radish.
- Higher cytokinin-low auxin ratio in tissue culture medium induces differentiation of stem, bud and leaves.
- Low Cytokinin-high Auxin ratio induces root formation in tissue cultures.
- The ageing process in plant is called '**senescence**'. This occurs due to breakdown of chlorophyll, reduction of RNA synthesis etc.
- Cytokinins delay senescence. This is called "Richmond Lang effect".
- Cytokinins induce opening of stomata by increasing potassium ion concentration in guard cells.
- BAP is used in horticulture to enhance shelf life period of lettuce and Asparagus and vase life period of flowers of Dianthus and Poinsettia.

Abscisic Acid (ABA)

- ABA is a growth inhibiting Hormone.
- Addicott etal isolated two compounds from cotton Bolls inducing fruit fall. They named these compounds as Abscisin I and II.
- Wareing isolated dormin from the leaves of Acer. Later Abscisin - II and Dormin were found to be same compounds.
- ABA is a terpenoid compound.
- It is synthesized anabolically from mevalonate pathway and catabolically from carotenoids.
- ABA is called stress hormone.
- Its concentration is high in dormant buds, seeds and senescent leaves.
- It is present in all parts of the plants except roots.
- Mosses, Fungi, vascular plants are found to have ABA.
- ABA is absent in bacteria.

Physiological effects of ABA

- ABA induces seed and bud dormancy. The inability of seed to germinate or bud to grow even under favourable conditions is called **dormancy**.
- Under conditions of water stress ABA induces closure of stomata and reduces transpiration.
- In a drying pond, perennating buds in Lemna arise due to ABA.
- Unlike cytokinins, ABA induces degradation of chlorophyll and promotes senescence.
- Application of ABA on leaves of potato before harvest prevents sprouting in tubers under storage.

Ethylene

- Gane (1934) suggested Ethylene to be considered as Hormone.
- Burg and Thimann proved that ethylene is a gaseous Phytohormone.
- Ethylene is a simple gaseous Hormone. It is synthesized from Methionine.
- Ethylene induces fruit ripening in apples, banana, tomato etc.
- Ethylene induces transverse geotropism. Inhibition of elongation, stimulation of thickening in stem and induction of horizontal growth are collectively called triple response growth. This causes transverse geotropism.
- Ethephon (2-chloro ethyl phosphonic acid) is an ethylene releasing substance widely used in horticulture.

• Ethephon is used for quick ripening of banana, apple, watermelon etc, for induction of synchronous flowering in pine apple, production of tobacco leaves with low nicotine content.

Photoperiodism

• The influence of the relative duration of day and night on the flowering response of plants is called **Photoperiodism**. The phenomenon of Photoperiodism was first discovered by **Garner and Allard**.

I. Short day plants(SDP)

In these plants, flowering is induced when they are exposed to a day duration (8-10hrs) which is shorter than a critical day length. In short day plants the dark period is critical and so it must be continuous for certain duration. These plants are also called long night plants.

e.g. Maryland Mammoth variety of Tobacco, Soyabean, Chrysanthemum etc.,

II. Long day plants(LDP)

In these plants flowering is induced by exposing them to a day duration (14-16 hrs) which is longer than a critical day length. In long day plants, the light period is critical so it must be continuous for certain duration. These plants are also called short night plants.

e.g.Spinach, Beet root

III. Day neutral Plants: In these plants flowering is unaffected by day length conditions e.g.Cucumber, Maize

Vernalization

- The term **vernalization** was coined by **Lysenko**.
- The method of inducing early flowering in plants by pre-treatment (of their seeds or young shoots) at low temperature is called **vernalization**.
- In case of annuals the influence of temperature on flowering is secondary to that of light. In these plants vernalization takes place at seed stage.

Incase of biennials the influence of temperature is primary.

- In perennials, plants are vernalized every successive winter.
- Vernalization simply prepares the plants for flowering by shortening the vegetative period of plant.
- It is believed that the perception of the cold stimulus results in the formation of a floral hormone called **vernalin.**

1. GROWTH LEVEL - I	I CURVE	908. Whi into
897. The concept of existence	of 'Chemical messengers'	1)M
which is responsible for	co-ordination of growth	3) In
between different parts o	of the plant is given by	909. Max
1)Francis Darwin 2) C	harles Darwin	1) St
3)Boysen-Jensen 4) Ju	lius Von Sachs	3)E
898. Growth regulators are		910. Slov
1)Inorganic substances	2)Phenolic compounds	1) L
3)Organic compounds	4)Minerals	3) S
899. Authors of 'Power of Mo	ovement in plants	911. The
1. Charles Darwin and F.	. Darwin	ingc
2. F.W. Went and Paul		1) La
3. Thimann & Skoog		3) Se
4. Yabuta and Sumiki		912. Subs
900. Phototropism was observ	ved by Charles Darwin in	cont
1)Sudan grass	2)Lemon grass	1) Vi
3)Lawn grass	4)Canary grass	3) Fo
901. The part of the Canary	grass chosen by Charles	913. The
Darwin to observe photo	tropism is	by
1)Root tip	2)Shoot tip	1)D
3)Coleoptile	4)Cotyledons	2) La
902. Scientist to propose that p	phototropic bending is due	3) B
to the diffusable substance	e synthesised in Coleoptile	4) D
	2)17	914. Whi
1) Went 3) Boysen Jenssen	2)Kurasawa 4)Vasuda	
003 The diffusable substance	4) Lasuua	1) La
tin was identified as	synulesised in Coleopule	3) L
1)Gibberellins	2)Auxins	915. Gra
3)Ethylene	4)Cytokinins	1)L
904. The diffusable substance	synthesised in Coleontile	3) Se
tip was identified as auxi	in by	916. Max
1)Went & Paal	2)Kurosawa-Yasuda	1) La
3)Charles Darwin	4)Francis Darwin	3) 50
905. Organic substances whi	ch are synthesized in one	4) E2
part of the plant and funct	tion at other parts in a very	LEVEL
low concentration are cal	lled	917. Iden
1) Phytohormones	2)Auxins	DGr
3) Gibberellins	4) Cytokinins	cent
906. Organic compounds produ	aced by living plant cells in-	IŊG
volved in process of grow	th and cell maturation are 2) Etherature	stand
1) Vitamins	2) Ethylene	III) 7
3) FIORMONES	4) AIKAIOIOS	
but co-ordinated process	vul is a very less complex	a spe
Reason(R). Growth is the	, e cumulative effect of cell	1)Ī
division, cell elongation a	nd cell differentiation.	3) IV

8. Which process is not i into a mature plant?	n the development of a seed
1) Mitosis	2) Differentiation of cells
3) Increase in size of c	ells4) Meiosis
9. Maximum growth occ	urs during
1) Stationary phase	2) Log phase
3) Exponential phase	4) Senescent phase
0. Slow and steady grow	th takes place in the
1) Lag phase	2) Log phase
3) Senescence	4) Linear phase
1. The phase of growth c	surve that corresponds to ag-
ing of cells is	
1) Lag phase	2) Log phase
3) Senescent phase	4) Exponential phase
2. Substances which ori	ginate at the tip of stem and
control growth are	
1) Vitamins	2) Enzymes
3) Food materials	4) Auxins / hormones
3. The classical experime by	nts in growth were perfomed
1) Darwin & Lamarck	
2) Lamarck and Boys	en Jenson
3) Boysen Jenson and	Darwin
4) Devries and Pall	
4. Which of the followin	g phase is known as Forma-
1) Log phase	2) Sanscant phase
3) Log phase	A) 1 & 3
5) Log pliase	4) 1 & J
1) Leaphase	2) Log phase
1) Lag pliase	2) Log pliase
5) Sellescellee 4) Log	g, Log & schescence phases
1) Log phase	2) Formativa phasa
1) Lag pliase	2) Formative phase
4) E-m - m - m ti-1 - m L - m	
4) Exponential or Logi	ritinmic phase
EVEL II	
7. Identify the incorrect s	statement / statements.
I) Growth hormones are centrations	e very effective in higher con-
II) Growth hormones a stances.	re commonly inorganic sub-
III) They act effective	v in the site of production
IV) Synthesis of horm	ones in plants is restricted to
a specific organ only	
1) I & II in correct 2)	II & III in correct

3) IV only correct 4) I, II, III IV are incorrect

2.AUX	INS
LEVEL - I	
918 These scientists contrib	uted for the discovery of
auxins	
1)Thimann-Skoog	2)Kurasawa-Yasuda
3)Went-Addicott	_)
4)Darwin, Boysen-Jenss	en.Paul
919. Bending of plant towar	ds the source of light is
because of	6
1)Gibberellins	2)Ethylene
3)Auxins	4) Cytokinin
920. The scientist who succeed	led in collecting Auxin into
agar blocks	-
1)Paul	2)F.W. Went
3)Yasuda	4)Charles Darwin
921. The experimental mate	rial chosen by Went for
bioassay of auxin is	
1) coleoptiles of Avena	
2) coleoptile of Canary g	grass
3) Rice seeding	
4) Maize endosperm	
922. The active and abundant	type of naturally occuring
auxin	
1) Indole butyric acid	2) 2,4-D
3) Indole acetic acid	4) 2,4,5-T
923. The following is not a nat	urally occuring auxin
1)Phenyl acetic acid	
2)Naphthalene acetic aci	d
3)4-Chloro indole acetic	acid
4)Indole acetic acid	
924. Stem cuttings can be ind	uced to produce roots by
applying	
1)Indole butyric acid	2)2,4 D
3)2,4,5 T	4)Ethylene
925. This is a highly efficient an	uxin used in horticulture to
induce roots on stem cutt	ings
1) IAA 2) NAA	3) 2,4,5 T 4) IBA
926. The movement of auxins	in plants is
1) Acropetal	2) Basipetal
3) Acropetal & Bisipetal	4) Lateral & Acropetal
927. The place of synthesis of	auxins is
1) Node	2) Root apex
3) Shoot apex	4) Root & shoot - apex
928. The precursor for the syr	thesis of IAA
1) Tryptophan	2) Glycine
3)Tyrosine	4)Lysine
929. Herbicides are the chemi	cals which kill
1) Insects	2) Weeds
3) Nematodes	4) Fungi

930. The positively geot	ropic nature of root and
negatively geotropic	nature of stem is due to the
effect of	
1) Gibberellins	2)ABA
3) Ethylene	4)Auxins
931. Decapitation of apical	bud causes
1)Bolting	2)Flowering
3)Elimination of apical	dominance
4)Reproduction	
932. The microelement requ	ired for the synthesis of auxin-
IAA is	
1) Boron 2) Zinc	3) Copper 4) Iron
933. Apical dominance is d	ue to
1) Auxin 2) Ethyler	ne 3) Cytokinine 4) ABA
934. The ability of auxins to	o induce parthenocarpic fruit
development was first	observed in
1) Cucumber 2) Toma	ato 3) Orchids 4) Brinjal
935. The following is not an	naturally occurring auxin
1) Phenyl acetic acid	
2) Napthalene acetic a	icid
3) 4-chloro indole ace	tic acid
4) Indole acetic acid	
936. The place of synthesis	of auxins is
1) Lead	2) Seed
3) Shoot apex	4) Endosperm
937. Which of the following	ig is not naturally occurring
plant hormone	
$\begin{array}{c} 1) PAA 2) IBA 3) \\ 028 A surin exactly as a size in a$	-Chloro IAA 4) IAA
1) Zing 2) Soming	2) Chusing 4) Leusing
1) Zinc 2) Serine	5) Glyclife 4) Leuslife
the light when the	grass do not bend towards
1) Tip is exposed to up	ilateral light
2) Base is exposed to a	milateral light
3) Tip is covered with	a light tight can
4) Treated with colchie	cine
940. Transport of auxins in	basipetal and acropetal di-
rections in the plant oc	curs in this ratio
1) 2 : 1 2) 1 : 1	3) 1 : 3 4) 3 : 1
941. Hormone involved in t	he differentiation of xylem is
formed from	-
1) Methionine	2) Acetyle Co.A
3) Tryptophan	4) Carotenoids
942. Fruit production in C	ucumbers can be enhanced
by increasing the produ	action of female flowers with
the applicaiton of	
1) Cytokinins	2)ABA
3) Gibberellins	4)Auxins
943. Phytohormone which	undergoes photo oxidation in
presence of light is	
1)Zeatin	2)IAA

4) GA

3)ABA

- 944. Identify the incorrect statement about auxins
 - 1) Higher or even moderate auxin concentration inhibits root growth
 - 2) Auxins are responsible for apical dominance
 - 3) Auxins favour the male formation of more flowers in Cucurbits
 - 4) Auxins came tropic movement

LEVEL II

- 945. Assertion (A): Coleoptile is curved towards the sour bot unit 2 & 3 final jagan.exe source of light Reason (R): Phototrophic movement is due to more growth on light exposed side and less growth on shaded side of stem tip
- 946. Assertion (A): 2, 4-D is a weedicide Reason (R): It is naturally occurring auxin and can kill dicots with broad leaves
- 947. Assertion (A): Parthenocarpic fruit is developed from pollinated ovary Reason (R): Tryptophan or Auxin present in the shoot apex.
- 948. Assertion (A): Root and shoot exhibit geotropic and phototropic movements respectively Reason (R): Differential concentrations of Auxins in root and shoot are responsible for these movements
- 949. Assertion(A): Auxin exhibits more basipetalous movement Reason (R): Auxin produced in root shows upward

movement

- 950. Identify the correct combination regarding 2-4D
 I) It is a natural auxin II) It is a weedicide
 III) It checks the growth of fungi IV)It is a viricide
 1) I & IV are correct 2) III & IV are correct
 - 3) I & III are correct 4) II & IV are correct
- 951. Identify the correct statement auxin

I) In plants auxins are present in very minute concentration

- II) Auxin exhibit bipolar movements
- III) IAA is from the precusor Tryptophan

IV) Synthetic auxins seems to be more effective than natural auxins

- 1) I, II, III, IV correct 2) II & III are correct
- 3) I & II are correct 4) III & IV are correct
- 952. Identify the correct statement:
 - I. Auxins induce tropic movement II. Auxins induce senscence
 - III. Auxins induce senscence
 - IV. Auxins induce bolting
 - 1) I only correct 2) II & III are correct
 - 3) I & IV are correct 4) I & III are correct

- 953. Leaf fall occurs when the content of
 1) Auxin increases
 2) Auxin decreases
 3) Abscissic acd increases
 4) Gibberellic acid decreases
- 954. Assertion (A): In Agriculture and horticulture, synthetic auxins are preferred to natural ones. Reason (R): Synthetic auxins are IBA & NAA
- 955. Assertion (A): A decapitated seedling fails to exhibit phototropism Reason (R): A decapitated seedling cannot synthesize auxins.
- 956. Assertion (A): Auxins bring about rhizogenisis in callus, along with cytokinins Reason (R): Auxins induce root formation in stem cuttings

3. GIBBERELLINS

LEVEL-I

- 957. 'Bakane' or 'foolish seedling disease' is because of
 - 1. Cytokinins 2. Gibberellins
 - 3. Ethylene 4. Auxins
- 958. Casual agent of bakane disease is
 - 1. Gibberella fujikuroi 2. Cercospora
 - 3. *Mycosphaerella* 4. *Glomerella*
- 959. Asexual stage of fungus responsible for foolish seedling disease
 - 1. Mycosphaerella berkeleyii
 - 2. Glomerella tukumanensis
 - 3. Phythium
 - 4. Fusarium moniliforme
- 960. Scientist to report first that some substance secreted by fungus is responsible for bakane disease
 - 1. Kurasawa 2. Yabuta 3. Sawada 4. Sumuki
- 961. Scientist to prove that sterile filterates of Gribberella fujikuroi cause disease in healthy plants
 - 1. Yabuta 2.Kurasawa
 - 3. Yasuda 4. Sawada
- 962. Gibberellins are
 - 1. Diterpenoids containing 20 carbons
 - 2. Monoterpenoids containing 10 carbons
 - 3. Diterpenoids with 18 carbons
 - 4. Monoterpenoids
- 963. This is the first gibberellin to be isolated and characterised.

1. GA_4 2. GA_{29} 3. GA_2 4. GA_3

- 964. Internodal elongation of plant is caused by
 - 1. Gibberllins2. Auxins3. Cytokinins4. ABA
 - $5. Cytokinins \qquad 4.$

965. Formation of seedless fruits is induced by 1 Cytokinins 2 ABA		976. The hormone isolated from the rice plants infected by foolish seedling disease is				
	3. Ethylene	4. Gibberllins		1) Auving	isease i	2) A B A
966.	The ability of gibbo	erellins to induce seed germination		$1) Auxilis \\ 2) Cilita anallina $		4) Costalainina
	was first demonst	rated by		3) Gibberellins		4) Cytokinins
	1. Kurasawa 3. Yabuta	2. L.G.Paleg 4. Sumuki	977	Hyper elongation of t is considered as one	the ster of the i	m tissue in higher plants important effects of
967.	The place of synth	esis of gibberellins inside the seed		1)Auxins		2) Gibberellins
	which help in seed	l germination is		3) Cytokinins		4)ABA
	1. Embryo	2. Testa	978	. Sexual stage of fungu	is caus	ing foolish seedling
	3. Tegmen	4. Endosperm		disease in rice is		0
968.	Gibberellins induc	ce the formation of this enzyme in		1) Gibberella fujiku	roi	
	seeds which hepl i	n germination		2) Fusarium monili	forma	e
	1. Pepsin 3. Transin	2. Kinase		 Puricularia onyzo 	7011110	•
969	'Rosette formatic	4.a - allylase		4) Class and la to ave	ie	
202	due to absence of	sin in cabbage and caumiower is	~ - ~	4) Giomerella tucun	nanen	SIS
	1. Auxins	2. Cytokinins	979	The hormone isolate	d from	the rice plants infected
	3. Gibberellins	4. ABA		by foolish seedling di	isease	will cause
970.	Induction of flowe	ering in plants is by		1) Senescence		2) Cell division
	1. Auxins 2. Gibb	perellins 3. 2,4,5-T 4. NAA		3) Bolting		4) Tropic movement
971.	Bolting is		LEV	VEL II		
	1. Rapid increase	in shoot length	980	Assertion (A): Gibber	rellins f	favour formation of male
	2. Rapid decrease	in shoot length		flowers in cannabis		
	3. Increase in root	t length		Reason (R): They en	nhance	e the number of fruits in
	4. Decrease in roo	ot length		a plant.		
972.	Increased flow	ver formation in roses and	981	Assertion (A): Parth	nenoca	arpic fruits are usually
	Rhododendrons of	can be induced by		seedless		
	1.2,5,4-T 2.N	AA 3. Gibberellins 4. ABA		Reason (R): Parther	nocarr	bic fruits will develop
973.	Identify the incorr	ect statement about gibberellins.		without fertilization	-	
	1) Gibberellins ar	e diterpenoids	982	Assertion (A): GA	conce	ntration is less during
	2) Generally gibbe	erellins contain 20 carbons in their		reproductive stage of	f cabba	age plant
	structure			Reason (R): In Pea, dv	varfisn	n is due to gene mutation
	3) A few gibbered	llins contain 19 carbons in their	983	Assertion (A): More	GA ca	used bolting in cabbage
	structure			Reason (R): Bolting	is due f	to gene mutation that
	4) Gibberellins pro	omote fruit ripening		resulted in less GA co	oncent	ration
974.	Incorrect expressi	on is:	984	. Identify the wrong st	atemer	nts
	1. All GA's are 20 GA7	OC compounds expect GA1 and		I. Gibberellins can be	extrac	cted from fungi only
	2. Auxin is the fir	st phyotohormone employed for		II. Gibberellins are ch	iemica	illy Diterpenoids
	parthenocarpic	fruit production		III. Like auxins Gibb	erellin	is induce apical growth
	3. Auxins cause cel	l elongation and cell differentiation		in plants		
	4. Both GA and Auxins induce parthenocarpic fruits			IV. Gibberellins when tical growth is induce	n appli cd	ed to Dwart plants, ver-
975.	Asexual stage of a	fungus causing foolish seedling		1) Except I all are inc	correct	t
	disease in rice is	J J J		2) Except II and IV	all are	incorrect
	1) Gibberella fuji	kuroi 2)Fusarium moniliformae		3) Except II all are in	correc	et
	3)Pyricularia ory	zae 4)Glomerella tucumanensis		4) Except III all are i	ncorre	ect
			l			

985. Identify the correct statements

I. Gibberellins promote simultaneous flower formation in pine apple plants

II. Gibberellins can increase flower formation in several plants like roses & poinsettias

III. Gibberellins induced more female flowers in cucurbita

IV) Gibberellins avert genetic dwarfism

1) Except III all are correct

2) Except I & III the rest two are correct

3) 2& 4

4) AMP & Isopentyl pyrophosphate

4. CYTOKININS

LEVEL - I

986. Identify the incorrect statement about Cytokinins

1) They are synthesized in the root system

2) They translocate from root system to shoot system

3) They are abundantly present in embryonic tissues

4) They help in the closing of stomata

987. Cytokinins are synthesized from

1)ATP 2)AMP

3) Isopentinyl pyrophosphate 4) 2 & 3

988. When the medium for Caulogenesis is compared with the medium for Rhizogenesis, the concentration of which of the following hormones is more for caulogenesis

1) IAA 2) 2, 4-D 3) Cytokinin 4) GA

989. 6-furfuryl amino purine is nothing but

1) Zeatin2) Kinetin3) Dormin4) Gibberellic acid

990. A plant growth regulator which is mostly synthesized in the root of the plant body is

1) Auxin 2) GA 3) Cytokinin 4) Ethylene

991. The ability of cytokinins to delay process of the senescence in plants is known as

1) Cholodny went theory 2) Richmond lang effect

3) Triple response growth 4) Burg & Thimann Effect

992. The precursor molecule of Cytokinins is

1)Adenine	2) Acetyl Co.A		
2) Madlana	1) T		

3) Methane 4) Tryptophan

993. The growth promoter that helps in the opening of the stomata is

1) Abscisic acid	2) Cytokinin
$2 \sum 1$	

3) Ethylene 4) Auxin

994. Vegetables in whch BAP is used for prolonged shelf life

1) Abscisic acid 2) Lettuce

3) Rose 4) Rumex

995. Zeatin was extracted and crystallized from immature maize seeds independently by

1) Miller and Letham 2) Skoog and Miller

- 3) Garner adn Allard 4) Calvin and Benson
- 996. A plant growth regulator which is synthesized all parts of the plant body is

1) Auxin 2) GA 3) Cytokinin 4) Ethylene

LEVEL - II

- 997. Assertion (A) : Delay in the process of leaf senescence is called Richmond Lang effect.
 Reason (R) : Cytokinins increase K⁺ concentration in guard cells
- 998. Arrange the events correctly leading to senescence and its treatment

I) Yellowing II) Application of cytokinin

III) Synthesis of ABA

IV) Delay of senescence

V) Decrease of chlorophyll content

- 1) I, II, III, IV, V 2) V, IV, III, II, I
- 3) III, V, I, II, IV 4) II, III, IV, I, V

5. ABSCISIC ACID (ABA)

LEVEL-I

999.	This is a growth inhibitor	
	1)Auxins	2)Abscisic acid
	3)Cytokinins	4)Gibberellins
1000	.15 - C Terpinoid compou	ind is
	1)ABA	2) Cytokinin
	3) Gibberrellin	4)Auxin
1001	.Dormin was extracted fro	om Acer leaves by
	1) Addicot 2) Wareing	3) Osborne 4) 1 & 3
1002	. Wheih of the following H Antitranspirant?	Iormone acts as Natural
	1) Ethylene 2) ABA 3) C	ytokinin 4) Gibberellin
1003	. ABA is synthesized catab	olically from
	1) Methionine	2) Tryptophan
	3) 6-furfuryl amino purine	4) Xanthophyll
1004	Formation of perennatin duced by	g buds in Lemma is in-
	1) A hormone that promot	tes opening of stomata
	2) A hormone that causes	triple response growth
	3) A hormone that inhinits	dormancy
	4)A hormone that delays s	prouting of potato tubers

1005.F	rom leaves of Acer, dor	min was isolated by
1)Burg	2)Addicot
3) Wareing et.Al	4) Thimann
1006 A	bscisin - II and dormin a	re structurally and physi-
0	logically identified as	ie su detaiung and physi
1) IAA 2) Zeatin 3) Gibb	erellic acid 4) ABA
1007.P	art of the plant body whe	ere cytokinins are mostly
S'	vnthesized is	
1) Leaves	2) Flowers
3) Roots	4) Cork
1008.7	The sprouting in tubers	can be prevented by the
a	pplication of	1 5
1	ABA 2) GA 3) Cyto	okinin 4) None
1009.W	Which of the following inl	nibits germination?
1) Gibberellic acid	2) Ascorbic acid
3) Zeatin	4) Abscissic acid
LEVE	Ĺ-II	,
1010.A	Assertion (A): Leaf senesc	ence is induced by ABA.
R	eason (R): ABA pro	motes degredation of
c	hlorophyll	č
1011.A	Assertion (A): ABA inhib	oits growth
R	teason (R) : It is present	in high concentration in
d	ormant seeds	0
	0. ETHYL	ENE
LEVE	L-I	
1012	Growth regulator respo	nsible for fruit ripening
1012.	1)Ethylene	2)Gibberellins
	3)Cytokinins	(4) Auxin
1013	Action of Ethylene on	Tobacco plant is
1015.	1) Induces flowering	100acco piant is
	2) Deduces Howering	utant of loaves
	2) Keduces Nicotille co	Sincent of reaves
	5) Increases leaf size	
1014	4) Induces Iropic move	ements
1014.	The chemical nature of	ethephon is
	1) Dichlorophenyl dime	ethyl urea
	2) 2-Chloroethyl phosp	phonic acid
	3) Phenyl mercuric ace	tate
	4) 2-Chloro methyl pho	osphonic acid
1015.	The triple response gro	owth in plants which in-
	volves inhibition of elor	ngation, induction of lat-
	eral growth and transv	verse geotropism is the
	characteristic feature of	Ĩ
	1) Cytokinins	2) Gibberellins
	3)ABA	4) Ethylene
1016.	A and B are two phytol	hormones. A is useful in
	increasing shelf life of	Lactuca, and Spinach. B
	promotes synchronous	senescence of Nicotiana
	leaves. In which one of	f the following pairs the
	former represents A and	d latter B, respectively

	1) Cytokinins and Ethylene
	2) Gibberellins and ABA
т бул	3) Auxins and Gibberellins 4) Zeatin and NAA
LEVE 1017	LII Assertion (A): Ethylene is applied in the form of
1017.	Ethenhon
	Reason (R): Ethylene is a gaseous hormone
1018	Identify the incorrect statement
1010.	I) Pea seedlings exhibit Triple response growth
	due to effect of ethylene
	II) Ethylene supresses flowering in all flowering
	plants
	III) Application of Ethylene in field conditions is
	difficult IV) Its appreliantian to take and large reduces
	Nicotine content of leaves
	1) II & III 2) II & IV 3) II 4) I III IV
1019.	Assertion (A): Ethylene is a gaseous hormone
10171	Reason(R) : It spreads by Osmosis.
	7 BHOTODEDIODISM
LEVE	II
1020.	Influence of Temperature on flowering is sec-
	ondary to that of light in these plants
	1) Annuals 2) Bienneals 3) Shurbs 4) Trees
1021.	Examples for Long day plants in
	1) Soybean 2) Maize
	3) Beetroot 4) Cucumber
1022.	Critical photoperiod generally varies between
	1) 12 to 15 hours 2) 10 to 14 hours
	3) 15 to 20 hours 4) 14 to 18 hours
1023.	Maryland mammoth plant is a variety of
	1) Chrysanthemum 2) Tobacco
	3) Beta 4) Spinach
1024.	Plants are classified, basing on initiation of flow-
	ering into 3 types, taking into consideration,
	which aspect of light?
	1) Intensity 2) Wavelength
	3) Duration 4) Quality
1025.	Following plant is a short day plant
100	1) Spinach 2) Beta 3) Glycine max 4) Cucumber
1026.	In short day plants, which is critical?
	1) Long photoperiod
	2) Photoperiod must be continuous
	3) Temperature 4) Dark period
1027.	Ethylene delays flowering, except in
	1) Apple 2) Mango 3) Pine-apple 4) Banana
1028.	Ethylene accelerates ripening of Fruits in
	1) Gymnosperm 2) Pteridophytes

4) Angiosperms

3) Bryophytes

III) It induces dormancy in buds and seeds

2) II & III are correct

IV) ABA is present in all living organisms

1035. Identify the wrong statements about ABA

II) It is an artificial antitranspirant

I) ABA is a sesquiterpene

1) I & II are correct

1029. Distinctive feature of Ethylene from other hormone is
1) Formed in roots 2) Organic acid
3) Formed in item 4) Gaseous nature

LEVEL II

1030. Identify the correct statements

I. Flowering in plants is based upon intensity of light

II. Flowering in plants depends on quality of light III. Flowering in plants depends upon the energy value present in light

IV. Flowering in plants depends upon the duration light exposed.

1) I & II correct 2) II & III correct

3) IV only correct 4) II & IV only

8. VERNALIZATION

LEVEL-I

- 1031. Substance responsible for flower induction is 1) Auxin 2) Vernalin
 - 3) ABA 4) Cytokinin
- 1032. Vernalization word was coined by
 1) W.went
 2) Garner and Allard
 3) Boysen & Jenson 4) Lysenko

LEVEL - III

1033. Identify the correct statements.
I) Bolting & flowering are connected with hormone Gibberellin
II. Auxins are connected with root initiation
III. Ethylene is connected with fruit ripening

- IV. Cytokinins promote or connected with cell divisions
- 1) I & II are correct
- 2) II & III are correct
- 3) I & IV are correct
- 4) I, II, III, IV are correct

1034. Identify the correct statements.

- I) Benzyl Adenine is a synthetic CytokininII) Cytokinins induce morphogenesis
 - III) Cytokinins promote senescence in leaves IV) High concentration of Cytokinins & low con-
 - centration of auxins induce shoot initiation
- 1) Except IV all are correct
- 2) Except III all are correct3) Except I all are correct
- 4) Except II all are correct

3) I & III are correct 4) I & IV correct
1036. Identify the correct statement pertaining to growth curve

I) Senescent phase is followed by lag phase
II) Lag phase is followed by log phase and senescent phase
III) Senescent phase is the declining phase of growth
IV) Maximum growth occurs during lag phase
I) I & II are correct

- 2) III & II are correct
- 3) II & IV are correct
- 4) II, III & IV are correct
- 1037. Match the following and find the correct combination

List-IList-IIA) Apical dominanceI) ABAB) Induction of Amylase formationII) AuxinsC) Richmond - Lang effectIII) Gibberellins

- D) Seed dormancy IV) Cytokinins V) Lectin
 - 1. A-II, B-III, C-IV, D-I 2. A-I, B-II, C-III, D-IV 3. A-IV, B-III, C-II, D-I 4. A-III, B-II, C-I, D-IV
- 1038. Parthenocarpy is induced by i) Cytokinin ii)Auxins iii) Gibberellins iv)Abscisic acid 1. i & ii are correct 2. ii & iii are correct 3. ii & iv are correct 4. only ii is correct 1039. Match the following: Scientist Name Discovery/Invention A. Julius von Sachs i. Food mobilization B. Thimann and skoog ii. Ethylene C. L.G. Paleg iii. Axillary buds iv. Organ forming D. Thimann-Burg substance v. GA3 А В С D IV III Ι Π 1) 2) IV Π Ш Ι IV I 3) Ш Π Π Ι 4) Ш IV

1040.	1040. Correct match is:					
Phytoh	Phytohormone Site of production Scientist concerned				tist concerned	
1) Auxin Shoot tip			Habe	Haberlandt		
2) GA3 Aleuron layer		Ware	Wareing			
3)	Cytoki	ninRoot		Skoo	g	
4)	ABA	Leave	es	Kura	sawa	
1041.	Match	the follo	wing			
	A)Cy	tokinin	I. Gene	mutatic	n	
	B)Aw	<1n	II. DN	II. DNA		
	C) Em	lylene	III. 5 : I	III. 3 : 1 (Basipetal & acropetal)		
	DJUF	Δ	R	C	D	
	1)	IV	Ш	I	I	
	2)	П	Ш	IV	I	
	3)	IV	Ι	III	II	
	4)	Π	Ι	III	IV	
1042.	Correc	ct match	is			
	P	lant	Horm	one	Role	
	1) Dia	nthus	BAP	Short s	helflife	
	2)Cuc	cur bits	Auxin	Stamin	ate flowers	
	3) Hoi	deum	GA3	Seed d	ormancy	
1042	4) Pine	eapple	Eureph	on	Flowering	
1045.0			IL IS	vovaho	rinatalaus	
	() Auxii () Crow	th in plan	ta ia rom	vays Das ilotod bi	siperatous	
4	indirac	sthy	lis is regi	liated by	phytonomones	
	Crow	ny zh of col	oontilo i	e owov f	rom chaded side	
-	1)GA i	a growt	h inhihit	s away 1 or	TOTH Shaded Side	
1044	Correct	statemer		01		
1044.0	1) Some	Phytoho	n 15 rmones	nromote	growth in plants	
	if they a	re at onti	mum coi	promote ncentrat	ion	
1	2) GA is	s synthes	ized in s	eed othe	er than embryo	
4	(2) (3)	ns are cru	stallized	1 from a	grass plant	
-	1) I ess	ovtokinir	s are nr	esent in	meristematic	
-	4) Less cytokinins are present in meristematic					
	1) 2 & 3 correct 2) 1 & 2 correct					
	$3)2\&^{2}$	4 correct	4)1&	3 corre	ct	
1045.]	Incorrec	et express	sion is			
]	[. Less a	uxin stim	nulates b	ranching	gifapical buds	
á	are remo	oved				
]	II. Ethyl	ene pron	notes fru	it ripeniı	ng	
]	III. α - A	Amylases	hydroly	yse the p	oroteins	
]	IV. Less GA promotes bolting					
	1) I & I	V		2) I &	II	
	3) III &	IV		4) I &	III	
1046.I	dentify	the correct	ct match	from th	e following lists.	
	LIST-	·I		LIST-2	2	
	A. Fru	it ripenin	g	I) Trop	isms causing	
	hormone					
	B. Flo	wering	I	I) Stres	s hormone	
	C. Ste	m and ro	oot T	I) Gase	ous hormone	

elongation D. Scenscence IV) Genetic dwarfism removed hormone 1) A-III, B-IV, C-II, D-I 2) A-I, B-IV, C-II, D-III 3) A-III, B-II, C-I, D-IV 4) A-III, B-IV, C-I, D-II 1047. Study the following lists: LIST-I LIST-2 A) Tryptophan I) α amylase in aleurone layer B) GA II) Cytokinin C) Adenine derivative III) Required for auxin synthesis IV) Sysquiterpene D) Stress hormone V) Induces flower senescence The correct match is 1) A-II, B-I, C-II, D-IV 2) A-III, B-II, C-I, D-IV 3) A-III, B-I, C-II, D-IV 4) A-IV, B-I, C-V, D-II 1048. Choose the correct match for phytohormone and bioassay LIST-I LIST-2 A) Cytokinins I) Induction of germination of seeds B) Gibberellins II) Induction of dormancy in buds C) Auxins III) Curvature of coleoptile D) ABA IV) Induction of cell division The correct match is 1) A-I, B-II, C-IV, D-III 2) A-IV, B-I, C-III, D-II 3) A-I, B-IV, C-III, D-V 4) A-III, B-I, C-IV, D-V 1049. Match the following and Identify the correct match: LIST-I LIST-2 A) 2, 4-D I) Flowering in pine apple B) GA II) Increases the K⁺ ion levels in guard cells C) BAP III) Freshness of flowers D) Ethephon IV) Weedicide V) Increase the sweetness of grape fruits The correct match is 1) A-IV, B-V, C-III, D-I 2) A-IV, B-II, C-III, D-I 3)A-II, B-IV, C-V, D-III 4) A-III, B-I, C-IV, D-II 1050. Study the following lists and identify the correct match. LIST-I LIST-2 A) Bolting I) Cytokinins B) Richmond & Lang II) Ethylene effect C) Transverse geotropism III) Gibberellins

D) Cholodny v	went theory IV) Auxin			
The correct match is				
1) A-III, B-I, C-II, D-IV				
2) A-II, B-I	2) A-II, B-IV, C-I, D-III			
3)A-IV, B-I	I, C-I, D-III			
4) A-II, B-I,	C-III, D-IV			
1051. Study the fe	ollowing table:			
Phytohormone	Scientist Organism from			
I) IAA	F.W. Went Avena sativa			
II) GA	Yabuta Wheat Plant			
III) Zeatin	Letham Maize			
IV) ABA	R. Gane Acer			
The correct	combination is			
1) I and II	2) I and III			
3) II and III	4) III and IV			
1052 Match the n	ames of phytohormones listed under			
column Lwit	the example listed under column II:			
choose the c	in the example listed under containin II,			
bination of a	Inhabets			
	LISI - 2			
A) Auxin	I) GA ₃			
B) Gibberel	lin II) Indole acetic acid			
C) Cytokini	n III) Abscisic acid			
D) Dormin	IV) Acetic acid			
	V) Zeatin			
The correct	match is			
1) A-II, B-I	II. C-I. D-V			
2) A-II B-V	/ C-I D-III			
3)A-II B-I	C-V D-III			
4) A-II B-I	V C-I D-V			
1053 Study the f	ollowing lists.			
LIST-I	LIST-2			
A) I G Paleo	D Ability of GA to mobilize			
<i>N</i>) E O I dieg	reserve food materials			
B) Dwarfiem	II) Polting			
D D wallish	$\begin{array}{c} \text{III} \text{ Dotting} \\ \text{III} \text{ Disclusion the symptosis of } C \text{ A} \end{array}$			
C) Transverse	III) Block in the synthesis of GA			
geotropism	due to gene mutation			
D) Miller and L	etham IV) Gaseous phytohormome			
	V) Zeatin			
The correct ma	itch is			
1) A-I, B-III, (C-IV, D-V 2) A-V, B-I, C-IV, D-II			
3) A-III, B-IV	, C-II, D-V 4) A-V, B-II, C-I, D-IV			
1054. Match the f	`ollowing:			
LIST-I	LIST-2			
A) Terpenoid	compound I) Gibberellic acid			
with 15 ca	rbons			
B) 6 furfurvl a	mino purine ID IA A			
C) Indole ring	with N III) ARA			
D) Ditomonoi	with twenty IV Vinctin			
carbons				

V) Ethylene
The correct match is
1) A-I, B-IV, C-II, D-III
2) A-III, B-IV, C-II, D-I
3)A-III, B-II, C-IV, D-I
4) A-V, B-IV, C-II, D-I
1055. Study the following table:
LIST-I LIST-2 A) Cratabinin D Banavial of constin dynamican
A) Cytokinin I) Removal of geneuc dwarnsm B) Auvin II) weed killer
C) Gibberellin III) Fruit ripening
D) Abscisic acid IV) Inducing dormancy
V) Opening of stomata
The correct match is
1) A-V, B-I, C-II, D-IV
2) A-II, B-I, C-III, D-V
3)A-V, B-II, C-I, D-IV
4) A-III, B-II, C-I, D-IV
Name of the Scientist Physiological
Hormone Associated with Effect
D Gibberellin Yabuta and Induces seed
Sumuki germination
II) Ethylene Haberlandt Wound healing
III) Cytokinin Miller and Richmond Lang
Letham effect
IV) Auxin F.W.Went Induces senescence
of Leaves
Choose the correct combination
1) I, II 2) II, III 3) I, IV 4) I, III
1057. Study the following lists:
LIST-I LIST-2
A) GA I) Perennation of lemma
B) Ethylene II) Increases the K ⁺ levels in guard
cells
C) ABA III) Induces differentiation of
C) ABA III) induces differentiation of
tracheary elements
D) Zeatin IV) Iriple response growth
V) Parthenocarpy
The correct match is
1) A-V, B-II, C-III, D-I
2) A-II, B-III, C-IV, D-I
3) A-V, B-IV, C-I, D-II
4) A-III, B-I, C-IV, D-II
1058. Read the following table:
Identify the correct.

PhytohormonesChemical formSite of synthesisI) AuxinsIndoleMostly in shoot	1062 Study the following table and identify correct match:LIST-ILIST-2A) Delaying the sprouting of I) Gibberellic acid
compound apex II) Gibberellins Purine derivatives Germinating seeds	eyes on potato tuber B) Elongation in the peduncle II) Cytokinin C) Formational parthenocarpic III) Indole butyric acid D) Delaying the vellowing of leaf IV) Ethylene
III) ABA Sesquiterpene Except in seeds	V) Abscisic acid
IV) Ethylene Tryptophan All plnat parts	1) A-IV, B-I, C-II, D-III
1) I & II 2) II & III 3) Only I 4) II & IV	2) A-V, B-I, C-III, D-II
1059. Study the following table:	$\begin{array}{c} 3) \text{A-IV, B-I, C-III, D-II} \\ 4) \text{A-III, B-IV, C-II, D-I} \end{array}$
Photohormone Precursor Physiological effect	$\begin{array}{c} 4) \text{ A-III, D-IV, C-II, D-I} \\ 1063 \text{Match the following:} \end{array}$
I) Auxin Tryptophan Causes apical	List I List II
dominance	A)Auxin I)Bolting
II) Gibberellin Acetyl Co.A Induces genetic	B) Cytokinin II) Opening of stomata
awarnsm III) Cytokinin Moyalania agid Dalaya tha	C) Gibberellic acid III) Formation of
moores of	D) Abscisic acid IV) Parthenocarny
	V) Triple response
IV) Ethylene Methionine Stimulate uniform	growth
flowering in	1) A-II,B-I,C-III,D-IV
nineapple	$\begin{array}{c} 2) \text{A-III, B-II, C-IV, D-I} \\ 2) \text{A} \text{ IV P I C III D II} \end{array}$
Identify the correct combinations	$\begin{array}{c} 3) A-IV B-II C-I D-III \\ 4) A-IV B-II C-I D-III \end{array}$
1) I & II 2) I. II & III 3) I. II. III & IV 4) I & IV	1064. Avena curvature test is used for bioassay of
1060. Study the following lists with regard to	1)Auxin 2)Gibberellin (JIPMER 2000)
phytohormones	3) Ethylene 4) Cytokinin
LIST-I LIST-2	1065. The movement of auxin is (JIPMER 2000)
A) Formed from Tryptophan I) Involved in fruit	3) Basinetal 4) Basinetal & Aeronetal
ripening	1066. Which of the following phytohormones is not
B) Formed from Methionine II) Protects from	naturally occurring? (JIPMER 2001)
water stress	1) Ethylene 2) Gibberellic acid
C) Formed from Carotenoids III) Bolting in rosette	(1067 - 2 4 - D + 3) 2, 4 - D + 3) 2, 4 - D + 3) 1067 - 2 4 - D + 3 an effective (11PMEP 2003)
plants	1) Fungicide 2) Weedicide
D) Formed from Acetyl CoA IV) Induces	3) Rodenticide 4) Wormicide
morphogenesis in	1068. Auxin in plant means for (JIPMER 2005)
Callus V) Causas aricel	1) Cell elongation 2) Fruit ripening
dominance	1069. Which of the following is an antigibberellin?
The correct metablic	(JIPMER 2004)
	1)Auxin 2)ABA
1)A-V, B-II, C-III, D-IV 2)A-IV, B-I, C-II, D-V	1070 The dormancy of seed is regulated by
3)A-V, B-I, C-II, D-III 4) A-II, B-V, C-I, D-III	(JIPMER 2005)
1061. Match the following;	1)ABA 2)Ethylene
LIST-I LIST-2	3) GA-3 4) Dihydrozeatin
A) Auxin I) Richmond effect	10/1. Which one of the following is a natural growth inhibitor?
B) Gibberellin II) Senscence and abscission	1) NAA 2) ABA 3) IAA 4) GA
C) Cytokinin III) Removal of genetic dwarfism	1072. The gaseous hormone inducing the ripening of
D) Ethylene IV) Root initiation	fruits is (JIPMER 1999)
V) Dormancy of buds and seeds	1)Auxin 2)Gibberellin
1) A-IV B-III C-I D-II 2) A-IV B-III C-II D-I	5) Florigen 4) Ethylene
$2) \land \blacksquare \models \blacksquare \lor \bigcirc \square \land \square \land \square \models \blacksquare \circlearrowright \bigcirc \square \lor \square$	1) Auxin 2) Gibberellin 3) Kinetin Δ
<i>JJ</i> A-III, D-I V, C-I, D-II 4 <i>J</i> A-II, B-III, C-I V, D-V	