

## **GROWTH AND DEVELOPMENT**

1. IAA /auxins produced by terminal bud; inhibits growth of lateral buds, when cut the suppression cease thus auxiliary buds sprouts.
2. Food stored is used in (mobilized) up for respiration and growth.
3. - They promote cell division  
- Promote fruit formation without fertilization/ parthenocarpy.
4. a) Oxygen is necessary for germination  
b) Germination in B, no germination in A.
5. The adult and larvae exploit different food riches; do not compete for food.
6. Endosperm material was converted into new cytoplasm/ the stored food endosperm is used up to the germination seed while the embryo is growing and adding on more protoplasm.
7. a) Condition necessary for the germination of seed /to show that water, oxygen and warmth are needed for germination.  
b) To absorb all oxygen from the jar  
c) C- to show water is needed for germination of seeds.  
d) Jar A – seeds would not germinate  
Jar B – seeds would has germinated  
e) i) Scarification i.e. scratching to make impermeable seed coat permeable  
ii) Varnilisation – Cold treatment e.g. species of wheat.
8. a) Apical bud produce auxins which inhibits the development of lateral buds.  
Removal of terminal buds cause the growth and development and sprouting of lateral buds.  
b) The pruning of coffee/tea.

- c) More yield /production
- 9.
- a) Low oxygen and increase in CO<sub>2</sub>
  - b) Germinating seeds respire using O<sub>2</sub> and release CO<sub>2</sub> only.
  - c) Absence of light, impermeability of seed coat to water, immature embryo, lack of growth hormones presence of inhibitors.
- 10.
- Epigeal germination – Epicotyle grows very fast pushing out of soil surface with the cotyleons.
- Hypogeal germination – Epicotyle grows very fast and plumule grows out forming first foliage leaves cotyledons remain underground.
- 11.
- a) Graph
  - b) i)  $68 \pm 1$   
ii) 130mm
  - c) Shoot A- Removal of apical bud promotes growth of lateral buds, due to removal of auxins hormones which inhibit lateral bud development.  
Shoot B- Gibberellic acid promotes growth of lateral branches  
Shoot C- Presence of apical bud inhibit lateral bud development due to reserve of auxins. This is called apical dominance.
  - d) As a control experiment to show the effect of hormones (auxins) on lateral bud development.
  - e) - Promotes flowering.  
- Promote lateral bud development hence increase yields.  
- Break seed dormancy (promote germination)

- f) - Germination
  - Flowering
  - Activate hydrolytic enzymes
- 12. a) - Absence of water (moisture)
  - Unsuitable temperature.
  - Lack of oxygen
  - Lack of light
- b) Hypocotyls
- 13. a) - Increase in dry mass
  - Increase in cell number
  - Irreversible increase in volume of cytoplasm
  - Increase in differentiation.
- b) i) Light intensity influence rate of photosynthesis.
- ii) Temperature – influence metabolic rate via enzyme action.
- c)

Name of hormone	Site of hormone production	Effect
Thyroxin	Thyroid gland	Control basal metabolic rate
Follicle stimulating hormone	Anterior pituitary gland	Maturation of Graafin follicle
Auxins	Stem of apex Root apex	Cell elongation
Gibberellins	All young plant tissues	Stimulates cell growth

14. a) It indicated the amount of organic material present which is a measure of change in mass cytoplasm.
- b) Weigh, reheat at 110°C for several hours, and cool constant Mass.
- c) Most of mass is starch which is converted to sugars and used up in respiration and other metabolic activities.
- d) Cellulose is synthesized during growth of new cell walls.
- e) Starch → Glucose → Cellulose