



13. Differentiate between:

- (a) hypocotyl and epicotyl;
- (b) coleoptile and coleorrhiza;
- (c) integument and testa;
- (d) perisperm and pericarp.

Ans:

Differences between Epicotyl and Hypocotyl			
<i>Epicotyl</i>		<i>Hypocotyl</i>	
1.	It is the part of embryonal axis in between plumule and cotyledon node.	1.	It is the part of embryonal axis in between cotyledonary node and radicle.
2.	In hypogeal germination, epicotyl elongates so that cotyledons remain in the soil.	2.	In epigeal germination, hypocotyl elongates so that cotyledons come out of soil.
3.	The terminal end of epicotyl is plumule.	3.	The terminal end of hypocotyl is radicle.

Differences between Coleoptile and Coleorrhiza			
<i>Coleoptile</i>		<i>Coleorrhiza</i>	
1.	The epicotyl bearing shoot apex and leaf primordia is enclosed in a foliar structure called coleoptile.	1.	The radical and root cap are enclosed in a sheath called coleorrhiza.
2.	Coleoptile has a terminal pore for the emergence of first leaf.	2.	Coleorrhiza is a solid structure.
3.	It protects the plumule during emergence from soil.	3.	It does not protect the radicle during its passage into the soil.
4.	It grows much beyond the grain.	4.	After emergence from grain it stops growing.
5.	Coleoptile after emergence from soil during germination, becomes green and does photosynthesis.	5.	Coleorrhiza does not come out of soil. It remains nongreen.

Differences between Integument and Testa			
<i>Integument</i>		<i>Testa</i>	
1.	It is the covering of the ovule.	1.	It is outer covering of seed.
2.	It is thin, one or two layered.	2.	It is quite thick and one layered.
3.	Its cells are living.	3.	Its cells are dead.
4.	Sclereids are absent.	4.	Cells are rich in sclereids.
5.	It arises from chalazal end of ovule.	5.	It is derived from outer integument of ovule after fertilization.
6.	It is prefertilized structure.	6.	It is a post fertilized structure.

Differences between Perisperm and Pericarp			
<i>Perisperm</i>		<i>Pericarp</i>	
1.	It is unused nucellus in the seed.	1.	It is the covering of fruit that develops from ovary wall.
2.	It is a part of seed.	2.	It is a part of fruit.
3.	It is usually dry.	3.	It is dry or fleshy.
4.	It is often nonfunctional for seed.	4.	It is protective covering and also helps in dispersal and nutrition.
5.	Perisperm is present in only a few seeds.	5.	It is found in all fruits.

14. Why is apple called a false fruit? Which Part(s) of the flower forms the fruit?

Ans: Botanically ripened ovary is called a true fruit. The fruits in which thalamus and other floral parts develop along with the ovary are called false fruits. For example - apple, strawberry, cashew etc. In apple the main edible portion of the fruit is the fleshy thalamus. Ovary forms the fruit after fertilization or without fertilization in

parthenocarpic fruits.

15. What is meant by emasculation? When and why does a plant breeder employ this technique?

Ans: Emasculation is the removal of stamens mainly the anthers from the flower buds before their dehiscence. This is mainly done to avoid self-pollination. Emasculation is one of the measures in the artificial hybridization. Plant breeders employed this technique to prevent the pollination within same flower or to pollinate stigmas with pollens of desired variety.

16. If one can induce parthenocarpy through the application of growth substances, which fruits would you select to induce parthenocarpy and why?

Ans: Parthenocarpic fruits are seedless. They develop from ovary without fertilization. Banana, grapes, oranges, Pineapple, Guava, Watermelon, lemon are selected because these seedless fruits are of high economic importance. The fruits in which seeds or seed part form edible portion (e.g., Pomegranate) are not selected to induce parthenocarpy.

17. Explain the role of tapetum in the formation of pollen-grain wall.

Ans: Tapetum is the innermost layer of the microsporangium. The tapetal cells are multinucleated and polyploid. They nourish the developing pollen grains. These cells contain Ubisch bodies that help in the ornamentation of the microspores or pollen grains walls. The outer layer of the pollen grain is called exine and is made up of the sporopollenin secreted by the Ubisch bodies of the tapetal cells. This compound provides spiny appearance to the exine of the pollen grains.

18. What is apomixis and what is its importance?

Ans: Apomixis is a mode of asexual reproduction that produces seeds without fertilization, e.g.- some species of Asteraceae and Grasses. This method is important in hybrid seed industry. Hybrids are extensively cultivated for increasing productivity. But the main drawback is that the hybrid seeds are to be produced every year because the seeds of the hybrid plants do not maintain hybrid characters for longer period due to segregation of characters. This can be avoided if apomixis can be introduced in hybrid seeds. For this reason scientists are trying hard to identify genes for apomixis.

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