

Ch- 18

Reproduction

Short questions:

1. What is follicle atresia?

The pituitary gland on the onset of puberty, releases follicle stimulating hormone (FSH) which stimulates the development of several primary follicles. Only one of these follicles continues to grow with its primary oocytes while the rest break down by a degenerative process known as follicle atresia.



2. What is after birth?

Within 10-45 minutes after birth, the uterus contracts and separate the placenta from the wall of the uterus and placenta then passes out through the vagina. This is called after birth. Bleeding, throughout this period, is controlled by the contraction of smooth muscle fibers which surround all uterine blood vessels supplying the placenta. Average loss of blood is about 350 cm³

3. What is the role of placenta in human? (LB-2008)

A placenta is established between the uterine and foetal tissues for the exchange of oxygen, carbon dioxide, waste, nutrients, and other materials. Placenta also secretes human placental lactogen. Both these hormones stimulate mammary development in preparation for lactation.

4. What is seed dormancy? Give its importance. (LB-2014)

It is the special condition of rest, which enables an embryo to survive long periods of unfavorable environmental conditions, such as water scarcity or low temperature. During this period of rest the embryo ceases or limits its growth. This is of great survival importance to the plant in that it prevents the dormant seed from germinating in response to conditions such as a warm spell in winter. Germination or resumption of normal growth by a dormant embryo requires certain, very precise combinations of environmental cues, to avoid any accidental stimulus which may prove fatal later.

5. What is the role of interstitial cells in sperm production? (LB-2012)

Between the seminiferous tubules are interstitial cells which secrete testosterone. This hormone is essential for the successful production of sperms and controls the development of male secondary sexual characteristics during puberty.

6. What is the structure and function of corpus luteum? (LB-2013)

The follicle cells, after release of the egg, are modified to form a special structure called corpus luteum. This yellowish glandular structure starts secreting hormone called progesterone. This hormone develops the endometrium and makes it receptive for the implantation of the zygote (Placenta formation).

7. What is parthenocarpy? (OR) Define parthenocarpy with examples. (OR) How does parthenocarpy differ from parthenogenesis? (LB-2010, 2011, 2013)

In some cases, fruit development proceeds without fertilization and thus no seed formation takes place e.g. banana, pineapples and some varieties of oranges and grapes. Such development is called parthenocarpy. It is due to hormonal imbalance; usually high auxin levels occur in these ovaries. Parthenocarpy is sometimes artificially induced for commercial purposes, by adding auxins in tomato, peppers etc.

8. Write down at least two important measures to prevent AIDS. (LB-2013)

The above dreadful sexual diseases can be controlled and prevented by avoiding sexual contacts with carrier or diseased person and adopting the hygienic conditions. The treatment involves medication for a long period except AIDS at present.

9. What are Oviparous, Viviparous and Ovoviviparous animals? (OR) Give difference between Oviparous and Viviparous animals. (OR) What are Ovoviviparous animals? Give examples. (OR) Differentiate between oviparity and viviparity. (LB-2008, 2009, 2012, 2013)

Features	Oviparous	Viviparous	Ovoviviparous
Definition	Fertilization is internal. Sperms are lodged in the female body where fertilization occurs. This may lead to external	Internal fertilization leads to internal development and development of embryo is	Internal fertilization leads to internal development of young one in a shelled egg and when development is

	development as in reptiles and birds. They lay shelled eggs to protect the developing embryo from harsh terrestrial conditions.	accomplished inside the female body, which gives birth to young one.	completed, shelled egg is laid which hatches to offspring.
Example	Arthropods	Mammals	Duckbill-platypus

10. Classify the plants according to photoperiodic requirement for flowering. (OR) Name types of plants according to photoperiodism. (LB-2013, 2015)

Short-day plants (SDPs)	Long-day plants (LDPs)	Day-neutral plants (DNPs)
Flowering induced by dark periods longer than a critical length, e.g. cocklebur 8.5 h; tobacco 10-11h. (Under natural conditions equivalent to days shorter than a critical length, e.g. cocklebur 15.5 h; tobacco 13- 14h) e.g. cocklebur (Xanthium), chrysanthemum, soyabean, tobacco, strawberry	Flowering induced by dark periods shorter than a critical length, e.g. henbane 13h. (Under natural conditions equivalent to days longer than a critical length, e.g. henbane 11 h). e.g. henbane (Hyoscyamus niger), snapdragon, cabbage, spring wheat, spring barley.	Flowering independent of photoperiod. e.g. cucumber, tomato, garden pea, maize, cotton.

11. Compare sexual and asexual reproduction. (LB-2015)

Asexual reproduction	Sexual reproduction (omitting bacteria)
One parent only.	Usually two parents.
No gametes are produced.	Gametes are produced. These are haploid and nuclei of two gametes fuse (fertilization) to form a diploid zygote.
Meiosis absent.	Meiosis is present at some stage in life cycle to prevent chromosome doubling in every generation.
Offsprings identical to parent.	Offsprings are not identical to parents. They show genetic variation as a result of genetic recombination
Commonly occurs in plants, less differentiated animals and micro-organisms. Absent in more differentiated animals.	Occurs in the majority of plant and animal species.
Often results in rapid production of large number of offsprings.	Less rapid increase in number.

12. Define photoperiodism and write its effects in plants. (OR) Give importance of photoperiodism in plants. (LB-2011, 2016)

The phenomenon in which variations in day length affects the different processes in plants is called photoperiod.

In plants, photoperiod, and temperature affect lowering, fruit and seed production, bud and seed dormancy, leaf fall and germination. Photoperiod effects flowering, when shoot meristems start producing floral buds instead of leaves and lateral buds.

13. Define apomixes. (OR) What is meant by apomixes? (OR) What is apomixes (LB-2014, 2018)

In flowering plants, one form of parthenogenesis is called apomixis. In this a diploid cell of the ovule, either from the nucellus or megaspore, develops into a functional embryo in the absence of a male gamete. The rest of the ovule develops into the seed and the ovary into the

fruit.

14. Define vernalization. (OR) What is vernalization? (LB-2012, 2018)

Biennials and perennial plants are stimulated to flowering by exposure to low temperature. This is called vernalization. The low temperature stimulus is received by the shoot apex of a mature stem or embryo of the seed but not by the leaves as in photoperiodism. Temperature around 4°C is found to be very effective. It stimulates the production of “vernalinal” hormone which induces vernalization, it is now believed that vernalinal is nothing special but is gibberellin. vernalization serve to synchronize the reproductive behavior of plants with their environment, ensuring reproduction at favorable times of year. They also ensure that members of the same species flower at the same time, encouraging cross pollination for genetic variability.

15. Differentiate between haploid parthenogenesis and diploid parthenogenesis. (OR) Define diploid parthenogenesis. (OR) Define diploid parthenogenesis. Give an example. (LB-2012)

Diploid parthenogenesis	Haploid parthenogenesis
The diploid egg develops into diploid offspring, it is called diploid parthenogenesis.	The haploid egg develops into haploid offspring, it is called haploid parthenogenesis.
Egg- producing cells of the female, undergo a modified form of meiosis involving total non-disjunction of the chromosomes, they retain the diploid number of chromosomes.	In the honeybees, males (or drones) develop from unfertilized eggs. The queen bee, though carrying male gametes from male, can lay eggs that have not been fertilized. The sperms she receives from a drone bee are stored in a pouch closed off by a valve. The eggs may be fertilized or may not be fertilized from the stored sperms.

16. Differentiate between menopause and ovulation. (OR) Explain menopause and after birth. (LB-2012)

The human menstrual cycle generally repeats every 28 days although there is considerable variation in different individuals or even within the same individual at different times of her age. The end or complete stop of the menstrual cycle is called menopause, after which the female stops producing the ova.

17. Differentiate between internal and external fertilization. (LB-2018)

External fertilization	Internal fertilization
External fertilization occurs in aquatic environment where male gametes can swim towards the female-gametes in water medium. Development is also external due to the constant / stable conditions of water (frog, fish etc.)	Sperms are lodged in the female body where fertilization occurs. This may lead to external development as in reptiles and birds. They lay shelled eggs to protect the developing embryo from harsh terrestrial conditions. Such animals are called oviparous. Others give birth to young ones called viviparous e.g. Mammals.

18. Differentiate between spermatogenesis and oogenesis. (LB-2009)

Spermatogenesis	Oogenesis
Sperm production in males	Egg production in females
Each testis consists of a highly complex duct system called seminiferous tubules, in which repeated division by the cells of the germinal epithelium produce spermatogonia. These increase in size and differentiate into primary spermatocytes which undergo meiotic division to form secondary spermatocytes and spermatids. Eventually, the spermatids differentiate into mature sperms.	Germ cells in the ovary produce many oogonia which divide mitotically to form primary oocytes. These are enclosed in groups of follicle cells. The primary oocyte divides meiotically into the haploid secondary oocyte and first polar body. Second meiotic division in the oocyte proceeds as far as metaphase but is not completed until the oocyte is fertilized by the sperm

19. Differentiate between identical twins and fraternal twins. (OR) How identical twins and fraternal twins are produced? (LB-2010, 2013)

Identical twins	Fraternal twins
In higher vertebrates including man, zygote after fertilization undergoes cleavage (cell division by mitosis). When embryo is at two celled stages, the two blastomeres, instead of remaining together, may separate and behave as two independent zygotes, each giving rise	In some cases, more than one egg is produced by the female and all these eggs are independently fertilized forming two or more zygote. These zygotes develop into new offspring, but with different genetic combinations. Such a twins or triplets are

to a new individual. Both the organisms are products of mitosis; thus, they have identical genetic make-up and are called identical twins. They are produced mitotically (asexually).	called fraternal twins or triplets. They are produced sexually.
---	---

20. How can you differentiate between menstrual cycle and oestrous cycle? (OR) Define/ Explain oestrous cycle. (LB-2014)

Menstrual cycle	Oestrous cycle
<ul style="list-style-type: none"> In females the production of egg is a cyclic activity as compared to males, where gamete production and release is a continuous process beginning at puberty and lasting throughout life. Egg release does not need any stimulus. 	<p>Oestrous cycle is a reproductive cycle found in all female mammals except human being. In this cycle, the estrogen production prepares the uterus for conception partly and follicle develops ova. At this stage, female needs a physical stimulus of mating for ovulation. She exhibits the desire for mating or is said to be on "heat".</p>

21. How lactation differ from gestation? (LB-2010)

Pituitary gland produces luteotropic hormone (LTH). Placenta also secretes human placental lactogen. Both these hormones stimulate mammary development in preparation for lactation.

22. How are test tube babies produced? (OR) What are test tube babies (LB-2009, 2014).

Parents which are unable to enjoy the normal process of fertilization and birth of their offspring due to some physiological and physical abnormalities in any of the two parents are being benefited with this method. Parental sperm and ovum are fertilized in vitro - outside the female body and then the zygote is implanted back into the mother uterus, placenta establishes, and remaining development takes place in the body of the mother leading to normal birth.