



Chapter # 18

Reproduction



Reproduction

“Reproduction is the mechanism that produces new generation and maintain a species”.

Every species of organism can reproduce and produce new individuals of that species. There are different methods of reproduction of in organisms. In some organisms these are quite complex. Reproduction differs from all other functions of animals in one respect, it is not necessary for survival of the individual but it is very important for the survival of a species or a population.

Q.1.(a) Write the Quranic Ayat which describes the creation of man?

ثُمَّ خَلَقْنَا النُّطْفَةَ عَلَقَةً فَخَلَقْنَا الْعَلَقَةَ مُضْغَةً فَخَلَقْنَا الْمُضْغَةَ عِظْمًا فَكَسَوْنَا الْعِظْمَ الْلَحْمًا ثُمَّ أَنْشَأْنَاهُ آخَرَ فَتَبَارَكَ اللَّهُ أَحْسَنُ الْخَالِقِينَ ﴿١٤﴾

“Then fashioned We the drop a clot, then fashioned We the clot a little lump, then fashioned We the little lump bones, then clothed the bones with flesh, and then produced it as another creation. So blessed by Allah, the Best Creator of all!” (Al-Quran 23:14)

(b) Define reproduction? Describe different types of reproduction.

Ans: REPRODUCTION:

A mechanism by which the individual produce its new generation and maintains its species is called reproduction.

Types of Reproduction:

Reproduction is of two types (1) Asexual reproduction (2) Sexual reproduction.

Asexual Reproduction:

Asexual reproduction does not involve the production of gametes and requires only single parent. The offspring is produced through mitosis and he is genetically identical to his parent. Different methods of asexual reproduction are fission, parthenogenesis, budding etc.

Sexual Reproduction:

Sexual reproduction involves the production of gametes through two parents. The gametes are produced through meiosis which fertilizes to form zygote. Meiosis is a reduction division which reduces the number of chromosomes to half and here



crossing over takes place which produce new recombination. Thus in this way in sexual reproduction the number of chromosomes are maintained and genetic variations take place.

Q.2. Explain reproduction in plants?

Ans. Plants show sexual and asexual both types of reproduction.

Asexual Reproduction:

The different methods of asexual reproduction are layering, grafting, budding etc.

Sexual Reproduction:

In sexual reproduction plants have diplohaplontic life cycle in which diploid sporophyte alternate with haploid gametophyte generations.

There are two types of alternation of generations.

* **Isomorphic alternation of generation**

In this case, the two generations are vegetatively similar.

* **Heteromorphic alternation of generation**

In this case, the two generations are dissimilar.

Sexual Reproduction in flowering plants:

The flowering plants have male and female gametes which fertilize to form zygote. Evolution of pollen tube is an important step as pollen tube act as vehicle for male gametes for their safe transport of gamete in ovule. These male and female gametes fuse to form zygote. Zygote develops in an embryo, there is storage of food for embryo and it is protected in seed coats.

Reasons of success of seed plants on land

Seed plants are predominantly present all around us due to their better sexual reproduction mechanism like;

1. modification of flower and inflorescence for pollination.
2. gamete transfer by pollen tubes.
3. food storage for developing embryo.
4. protection by seed coats
5. dispersal with the help of fruit formation
6. Seeds are capable of enduring unfavourable conditions in dormant form and as soon as conditions become favourable for establishing the seedling it germinates.

Evolution of pollen tube

Pollen tube acts as vehicle for safe transport of male gametes to female gamete in ovule in land environment.

It is an important step in land adaptation by spermatophytes. Evolution of pollen tube is parallel to evolution of seed. It is a tool for the success of seed plants.



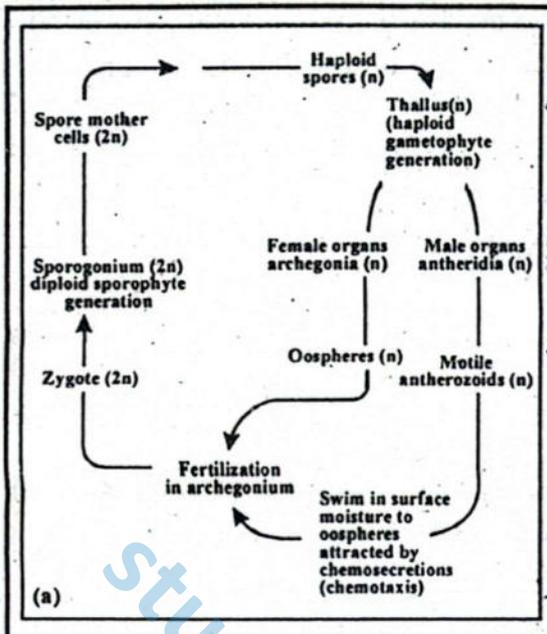


Fig. (a) Bryophyte life cycle. Note that the sporophyte is completely dependent upon the gametophyte.

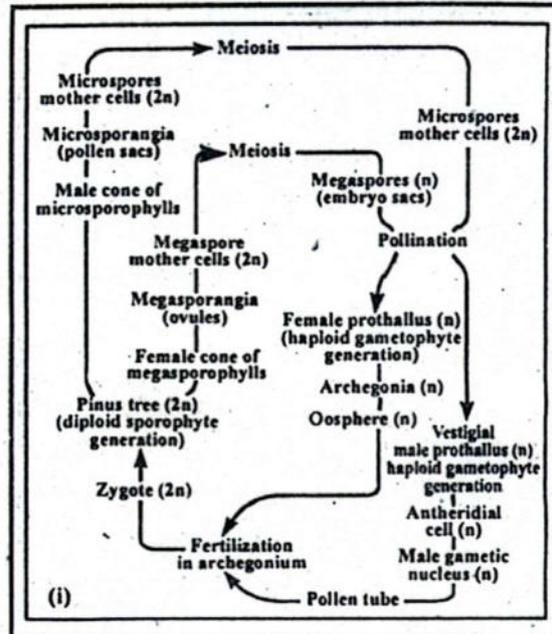


Fig. (b) Spermatophyte life cycles (i) Gymnosperm life cycle, *Pinus sylvestris* (Class Pinatae). (ii) Angiosperm life cycle.

Seed Dormancy:

“The inactivity of seed during unfavourable condition is called seed dormancy”.

(OR)

Early in the development of an angiosperm embryo and event takes place that embryo stops developing. This is called seed dormancy.

It is a special condition of rest which enable an embryo to survive long period of unfavorable environmental conditions such as water scarcity or low temperature.

During the dormant stage the embryo's metabolic activities stop, a severe dissociation occurs.

Importance:

This event has great importance for survival of plants in that it prevents the dormant seed from germinating in response to conditions such as warm spell in winter. This warm spell is favourable only temporarily. Thus seed dormancy has a great survival importance for plant. The dormant seed need very precise combinations of environmental cues for germination or resumption of normal growth. In this way, it avoids any accidental stimuli which may be fatal later on.

Germination:

Germination is a normal growth by dormant embryo requires certain stimulus such as availability of water and oxygen etc.

Fruit Set and Fruit Ripening

Following plant hormones take part in the formation and ripening of seed.

1. Auxins

Germinating pollen grain is an important structure for safe transfer of gametes for fertilization. It is also a rich source of auxin. It also stimulates the tissues of style etc.

ovary to produce more auxin. This auxin is necessary for fruit set i.e., retention of the ovary. The ovary becomes fruit after fertilization. Without auxin the abscission of flowers normally occurs. This abscission leads to low fruit yields. After fertilization, the ovary and the ripe seeds continue to produce auxin. This auxin stimulates the fruit development.

2. Gibberellins and Cytokinins

Developing seeds are rich source of auxins, gibberellins and cytokinins. These with development of the embryo and accumulation of food reserves in the seed or in the pericarp (fruit wall).

3. Ethane

The respiratory activity starts rapidly during ripening of fruit. It is associated with ethane production. Ethane helps in ripening of the fruit.

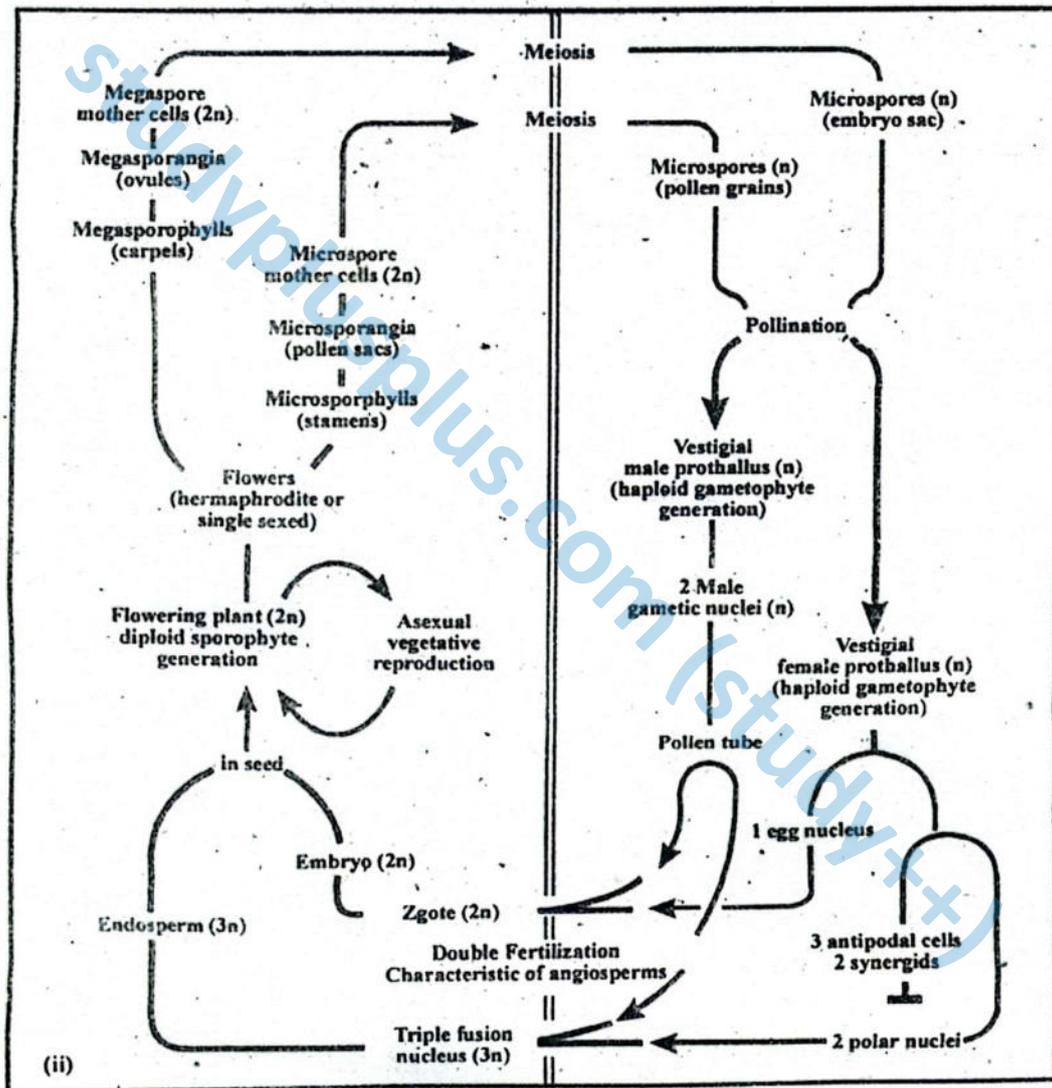


Fig. (ii) Angiosperm life cycle

Parthenocarpy:

In some plants fruit is developed without fertilization and no seed is produced. This type of development is called parthenocarpy.

Parthenocarpy occurs due to normal imbalance. Usually high auxin is also induced artificially. The plants which show parthenocarpy are banana, pineapple etc.

Q.3. Explain the process of photoperiodism.

Ans. DEFINITION:

The response of an organism to changes in relative lengths of light and dark is known as photoperiodism. Photoperiodism and temperature effects flowering, fruit and seed production, bud and seed dormancy, leaf fall and germination.

Flowering Response:

Photo period affect flowering, when shoot meristem starts producing floral buds instead of leaves and lateral buds. This effect of photoperiodism was first studied in 1920 by Garner and Allard. They examined the tobacco plant flowerings only after exposure to a series of short days. Tobacco plant flowers naturally under same conditions in autumn but flowering could be induced by conditions artificially to short days exposing.

The flowering responses of plants fall into two basic categories in relation to day length.

Short day plants:

These plants begin to flower when the days become shorter than the critical length e.g. soybeans are short day plant.

Long day Plants:

These plants initiate flowers when days become longer than certain length e.g. wheat spring.

Effect of darkness on Flowering

In both kinds of plants it is actually the length of darkness that is significant and not the length of day. Thus short day plants are really long night plants. If they are grown in short days but the long night is interrupted by a short light period, flowering is prevented. Long day plants will flower in short days if long night period is interrupted.

Table (a) Classification of plants according to photoperiodic requirements for flowering

Short-day plants (SDPs)	Long-day plant (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 (<i>Xanthium</i>), 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 (<i>Hyoscyamus niger</i>), snapdragon, cabbage, spring wheat, spring barley.	Flowering independent of photoperiod. e.g. cucumber, tomato, garden pea, maize, cotton.

Table (b) Some phytochrome-controlled responses in plants.

General process effected	Red light promotes
Germination	Germination of some seeds, e.g. some lettuce varieties Germination of fern spores
Photomorphogenesis (light-controlled development of form and structure).	Leaf expansion in dicotyledons. Leaf unrolling in grasses (monocotyledons). Chloroplast development (protoplasts convert to chloroplast see etiolation). Greening (protochlorophyll converted to chlorophyll). Inhibition of internode growth (including epicotyl, hypocotyls, mesocotyl), i.e. preventing of etiolation. Unhooking of plumule in dicotyledons.
Photoperiodism	Stimulates flowering in long-day plants. Inhibits flowering in short-day plants. See flowering.

Chemical Basis of Photoperiodic Response:

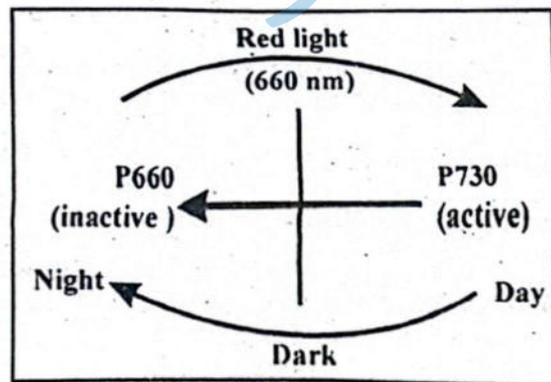
A detail study of photoperiodic response shows that light is also influenced by the quality of life. Cocklebur a short day plant will not flower if its long night is interrupted but experiments revealed that red light was effective in preventing flowering but far red light served the effect of red light. It was also demonstrated that the last light treatment always determines the response. The response to light intensity and quality lead to the discovery of blue light sensitive protein pigment phytochromes.

TYPES OF PHYTOCHROMES:

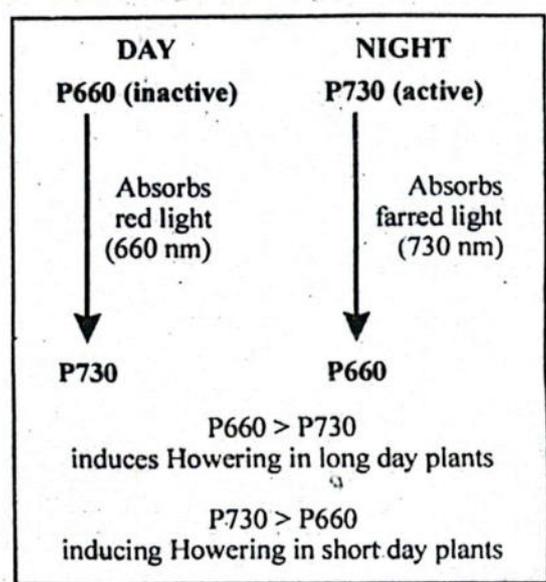
Phytochromes exist in two forms i.e. P660 and P 730, P 660 a quiescent form absorb red light at wave length of 660 nm and is converted to active P 730, P 730 absorb for red light at 730 nm and is converted to P 660. In nature the P 660 to P 730 conversion takes place in daylight P 730 to P 660 conversion occurs in the dark. Thus during the day a plant has P 730 Phytochromes while during the light. It contains more Phytochromes in the form of P 660. The presence of either form provides the plants with the means of detecting whether it is in a dark environment. The rate at which P 730 is converted to P 660 provides the plants with a "Clock" for measuring the duration of darkness.

Effect of Phytochromes Flowers:

It has been found that red light inhibit flowering the short day plants but promotes flowering in long day plants under condition during which flowering normally takes place. This observation led to hypothesize that the P 730 - P 660 inter conversation might be the plant time regulator for flowering. According to this hypothesis, P 730 converted from P 660 by



the absorption of red light, would inhibit flowering in short day plants but promote flowering in long day plants. Because P 730 accumulates in the day and lineages at night, short day plants could flower only if night were long enough during which a great amount of P 730 would be completely inactive, so that enough P 730 would remain at the end of light to Promote flowering. But now it is generally agreed that the time measuring Phenomenon of flowering is not totally controlled by the interconversion of P 660 to P 730.



Effects of length of day on flowering:

Other factors like presence or absence of light and length of dark or light period also play an important role on flowering. Phytochromes seem to be responsible for detection of either light or darkness. The biological clock once stimulated causes production of florigen hormone in leaves which travels through phloem to buds.

Q.4. Define vernalisation? Write the importance of vernalisation and photoperiodism.

Ans. DEFINITION

Biennials and perennials plants are stimulated to flower by exposures to low temperature. This is called vernalisation.

Explanation:

In some plants vernalisation is absolute requirement and in some cases it assist in inducing flowering. The duration of low temperature treatment is required from four days to three months. Temperature of about 4°C is much effective. It stimulates the production of "vernalinal" hormone which induces vernalisation.

Importance of photoperiodism

Photoperiodism and vernalisation serve to synchronise the reproductive behaviour of plants with their environment ensuring reproduction at favourable times of year. They also ensure the members of same species flower at same time encouraging cross pollination for genetic variability.

Q.5. Discuss asexual reproduction in animals.

Ans. There are different methods of asexual reproduction in animals such as binary fission, multiple fission budding, parthenogenesis, tissue culturing, cloning and identical twins.

1. PARTHENOGENESIS:

A type of asexual reproduction in which egg is developed without fertilization is called parthenogenesis. It accelerates the normal reproductive role.

In Bees:

Among bees development of eggs into adults does not require fertilization. The fertilized eggs develop into diploid females, but unfertilized eggs also undergo development becoming haploid males. The queen bee, through carrying male gametes from male, has ability to lay eggs that have not been fertilized. The sperms she receives from drone bee are stored in pouches. As haploid egg develop into haploid males it is called haploid parthenogenesis

In Vertebrates:

Parthenogenesis can occur in vertebrates also. Some lizards, fishes and amphibians are capable of reproducing in this way. Their unfertilized eggs undergo mitotic division with out cell cleavage to produce a diploid cell, which then undergoes development as if it were a diploid zygote.

In Aphids:

In aphids diploid parthenogenesis many occur, in which the egg producing cell of female undergoes a modified form of meiosis involving total non-disjunction of chromosomes, they retain the diploid number of chromosome. Egg diploid develops in young females.

2. CLONING:

The procedure of producing a line of genetically identical cells from single altered cell is called cloning.

Technique:

In this technique the nucleus from somatic cell is removed and introduced in an egg cell. The nucleus of egg cell is already destroyed by ultraviolet reaction. The egg cell now contains only nucleus of somatic cell which is diploid. This egg cell develops into a complete organism which is genetically identical his parent who has contributed the nucleus.

Advantages of cloning:

Cloning has following benefits in the world of Biology.

1. The cloning of many desirable animals such as racehorses prizebulls is much useful for man. Similarly cloning of many useful varieties of plant is much more important for man.
2. The use of cloned cell allows the quantitative study of action of hormones drugs and antibodies.
3. Such technique is useful for investigating affect of drugs, cosmetics and pharmaceutical products on animals cell without exposing laboratory animals to these chemicals.
4. The offspring produce by this method show the same behaviour.

Disadvantage:

The application of this technique to humans would be open to serious moral questions.

3. TWINS:

The twins produced may be identical twins or non identical twins.



Identical Twins:

In higher vertebrates including man, zygote after fertilization undergoes cleavage. Cleavage is a series of repeated cell division by mitosis when embryo is at two celled stage, then two blastomeres instead of remaining together, may separate and behave as two independent zygotes each giving rise to new individual. Both the organisms are products of mitosis, thus have identical genetic make up and are called identical twins. They are produced mitotically (asexually).

Fraternal Twins:

In such cases females produce more than one egg and call are fertilized forming two or more zygote. This zygote develops into new offsprings but with different genetic combinations. Such twins or triplets are called trip let twins or triplets.

Q.6. Differentiate between asexual and sexual reproduction?

Ans:

Table

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.
Offspring identical to parent.	Offspring 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 animals species.
Often results in rapid production of large numbers of offspring.	Less rapid increase in numbers.

Q.7. What is sexual reproduction? Explain in detail.

Ans: **DEFINITION:**

The *method of reproduction* in which union of gannets take place is called sexual reproduction.

TYPES OF GAMETES:

These gametes may be similar called isogametes or different called heterogametes. In heterogametic stage male gametes (sperms) are motile and females gametes (Ova) are non-motile.



Differentiation of Sex:

Differentiation of sex is found in those organisms which undergoes sexual reproduction. Some organisms have one sex, those are called unisexual. Some have both sexes called hermaphrodite or bisexual e.g. earthworm tape worm etc. Animals usually are unisexual.

FERTILIZATION:

In sexual reproduction union of gametes leads to fertilization. Fertilization is of two types.

- (i) External Fertilization
- (ii) Internal fertilization

(i) External Fertilization:

This type of fertilization occurs in aquatic environment where male gametes can swim towards female gamete in water. Development is also external examples of such animals are frogfish etc.

(ii) Internal Fertilization:

This type of fertilization is found in terrestrial conditions sperms enter in the female body where it unites with egg.

DEVELOPMENT:

According to the development of zygote the animals are classified into three groups:

- (i) Viviparous
- (ii) Oviparous
- (iii) Ovaviviparous

(i) Viviparous

In this type internal fertilization leads to internal development and development of embryo is completed in female body which give birth to young one. Such animals are called viviparous. Mammals are viviparous animals.

(ii) Oviparous:

Oviparous animals show external development. Animals lay shelled eggs to protect the developing embryo from harsh terrestrial conditions. Reptiles and birds are the examples of oviparous animals.

(iii) Ovaviviparous:

In such animals internal fertilization leads to internal development of young one in a shelled egg and when development is completed shelled egg is laid which hatched the off spring. Mammals like Duck bill platypus are ovaviviparous animals.

Q.8. Write an account on male reproductive system.

Ans. Male reproductive system consists of following parts.

- (1) External genitalia lying outside the body of testis in a sac like scrotum.
- (2) Male reproductive organ used to transfer sperms in female reproductive tract.

FORMATION OF SPERMS:

The sperms are produced in the testis. Each testis consists of highly complex duct system called seminiferous tubules which consists of cells of germinal epithelium. These cells undergo repeated division to produce spermatogonia. Spermatogonia undergo mitotic division to form primary spermatocyte. Primary spermatocytes are changed into secondary spermatocytes and spermatids meiotically. Each spermatid differentiates into mature sperms having half the number of chromosomes.

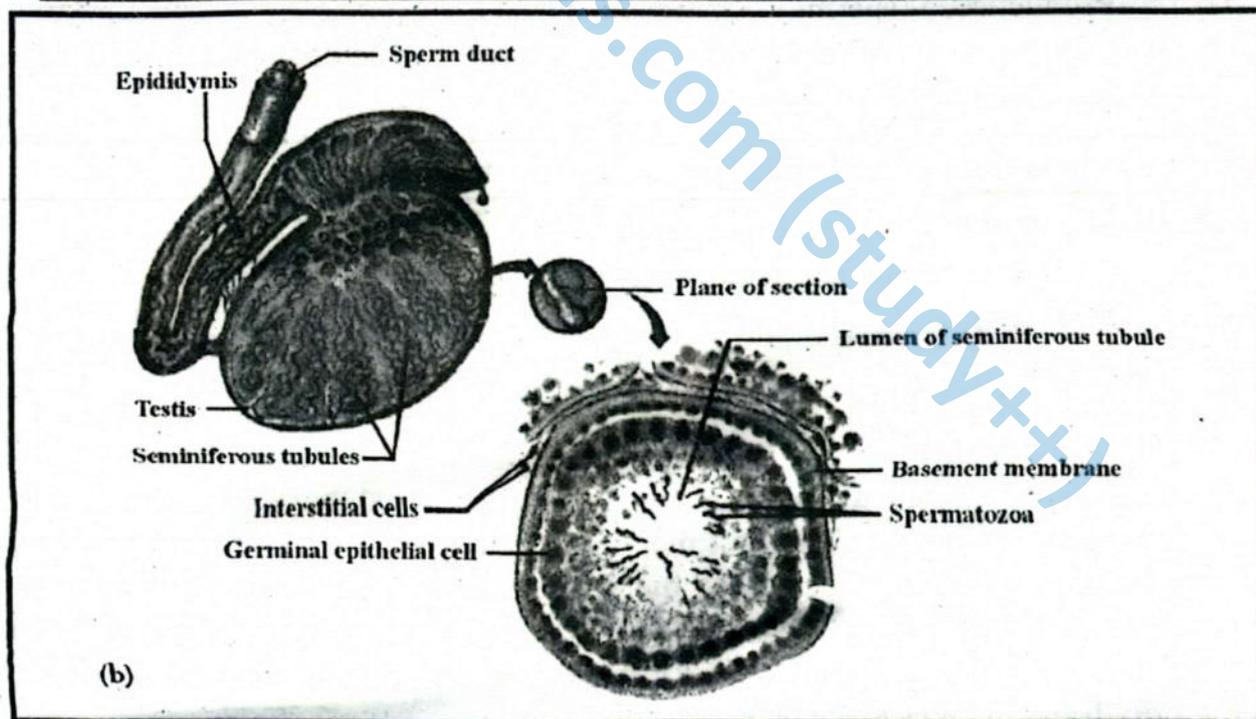
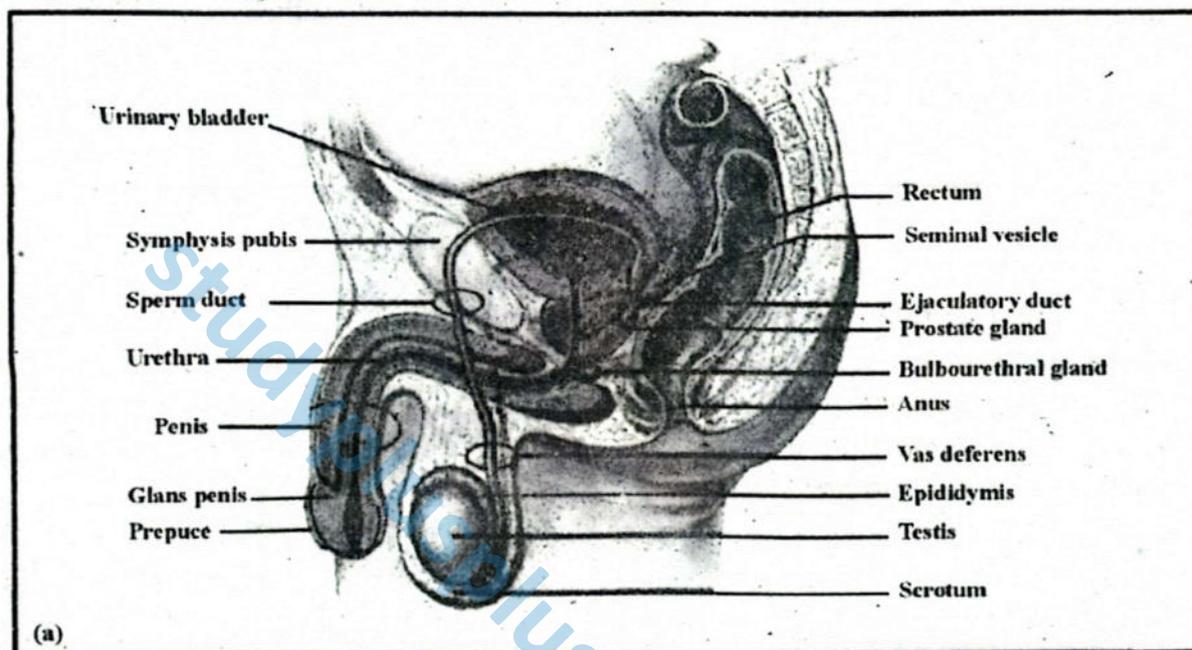


Fig. The human male reproductive system

The male reproductive system consists of two testes that produce sperm, ducts that carry the sperm, and various glands.

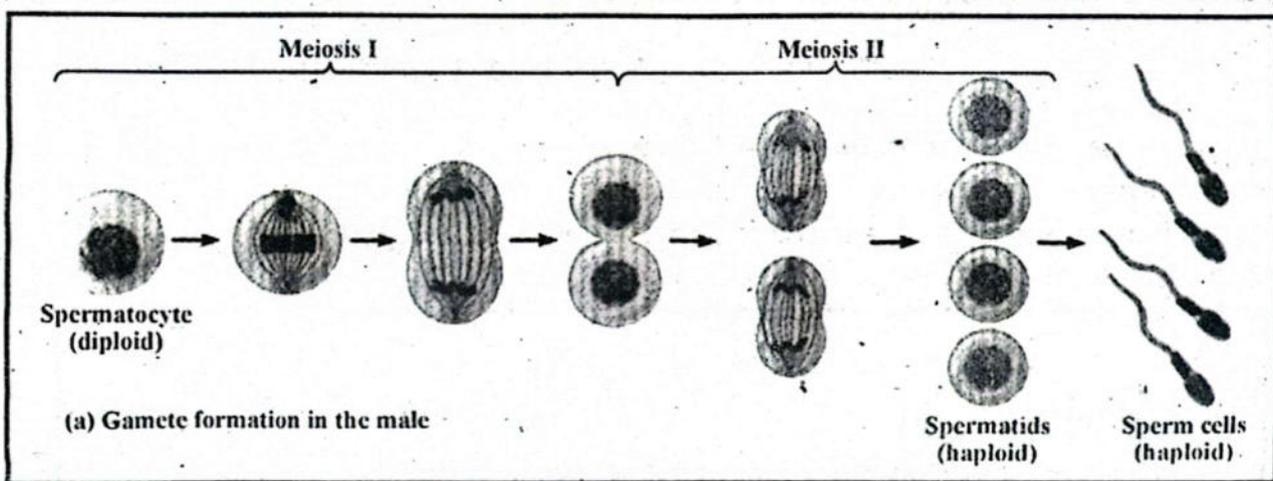


Fig. Gamete formation

Sperms:

Sperms are the male gametes which are present in testes where sertoli cells provide liquid medium protection and nourishment to sperms while they are in tubules. Vas deferens is the main duct of male reproductive tract where the sperms are transferred. The highly convoluted portion of vas deferens is epididymis. The sperms then pass through urinogenital duct and are discharged out.

MALE HORMONE:

The male hormone is testosterone which are secreted in interstitial cells of seminiferous tubules. This hormone controls the following functions.

- (i) Production of sperms.
- (ii) Development of male secondary sexual characteristics such as beard, moustache etc.

Q.9. Explain in detail the female reproduction system.

Ans. The female reproductive system consists of.

- (1) Ovaries a pair which lies in body cavity of female
- (2) Oviducts
- (3) Uterus
- (4) External genitalia

FORMATION OF OVUM:

In the ovary there are germ cells which give rise to oogonia. Oogonia undergo mitosis to form primary oocyte. The first meiotic division takes place in primary oocyte which forms 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 sperm. This phenomenon is completely different from the oogenesis of frog as in it second meiotic division takes place before fertilization.

Ovulation:

In human only one ovum is discharged from ovary at one time. This phenomenon is called ovulation.

Fertilization of Ovum:

As the ovum is produced it is transferred to the oviduct which is also called uterine tube or fallopian tube. The sperm enter in the proximal part of the oviduct where ovum is fertilized and ovum completes its second meiotic division forming egg and second polar body. The zygote formed after fertilization enters the uterus where it undergoes further development. The zygote undergoes series of divisions (cleavage) to form foetus. A placenta is formed between the wall of uterus and foetal tissues. The placenta provides nourishment, oxygen and other materials from mother to foetus. It also acts as excretory organ for fetus. Uterus opens into the vagina through cervix. Urethra and vagina has independent openings to anterior

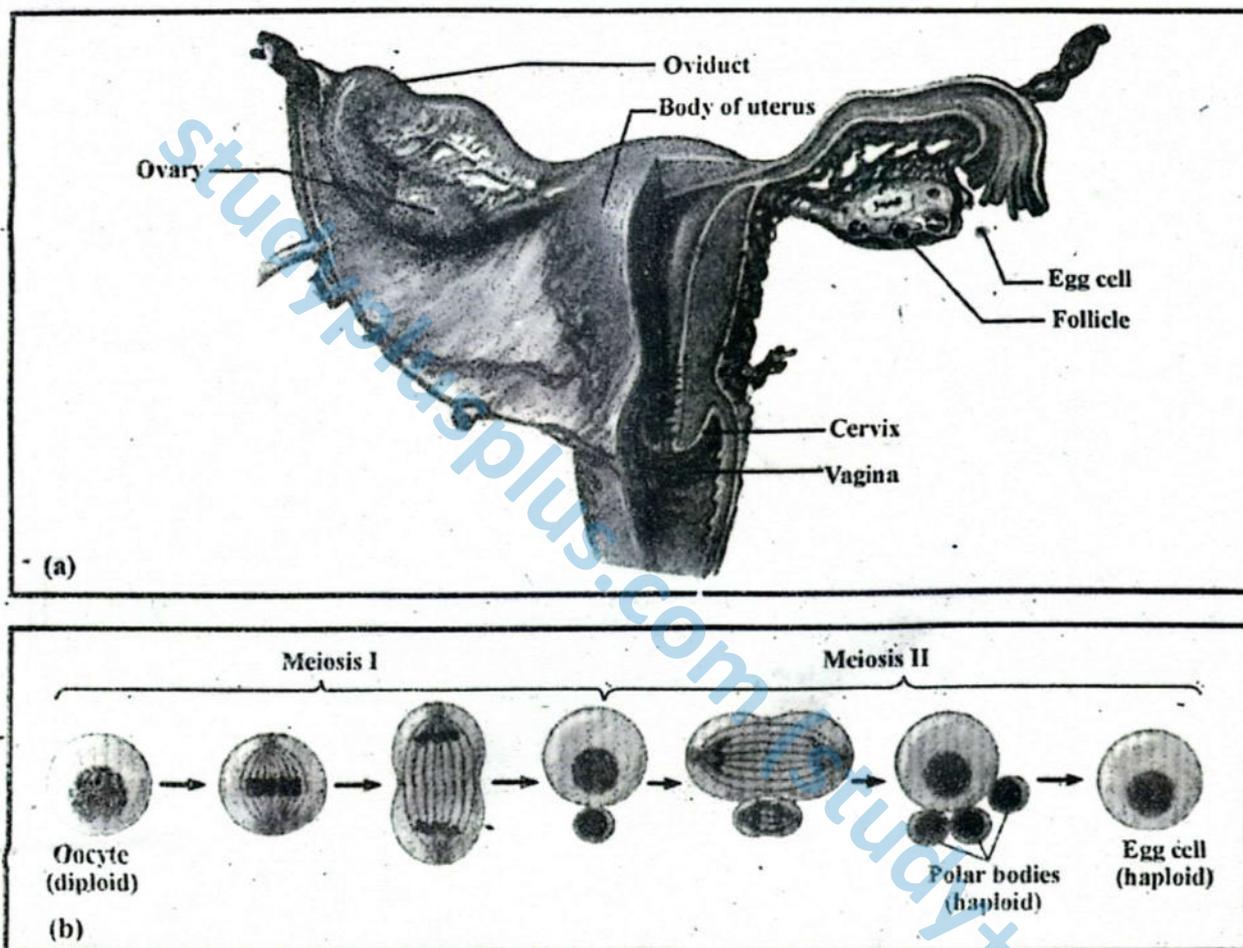


Fig. (a) The human female reproductive system (b) Gamete formation

Q.10. Explain all the primary steps involved in the female reproductive cycle.

Ans. Female reproductive cycle involves production of egg which is a cyclic activity. It is also called menstrual cycle.

MENSTRUAL CYCLE:

The cycle which involves changes in structure and function of whole reproductive system is called menstrual cycle. It is completed nearly in 28 days. The events of menstrual cycle involves the ovaries and uterus and these are regulated by pituitary gonadotropins.

Steps involved in cycle:

The primary steps involved in this cycle are:

1. The first step is also called **proliferative phase** in which pituitary gland releases follicle stimulating hormone (FSH). The target of FSH is to stimulate the development of many primary follicles. At first many primary follicles are stimulated to grow but only one reaches to its maturity and this is called Graafin follicle as it contains fluid filled cavity around the oocyte. The other follicles break down by degenerative process known as follicle artesian.

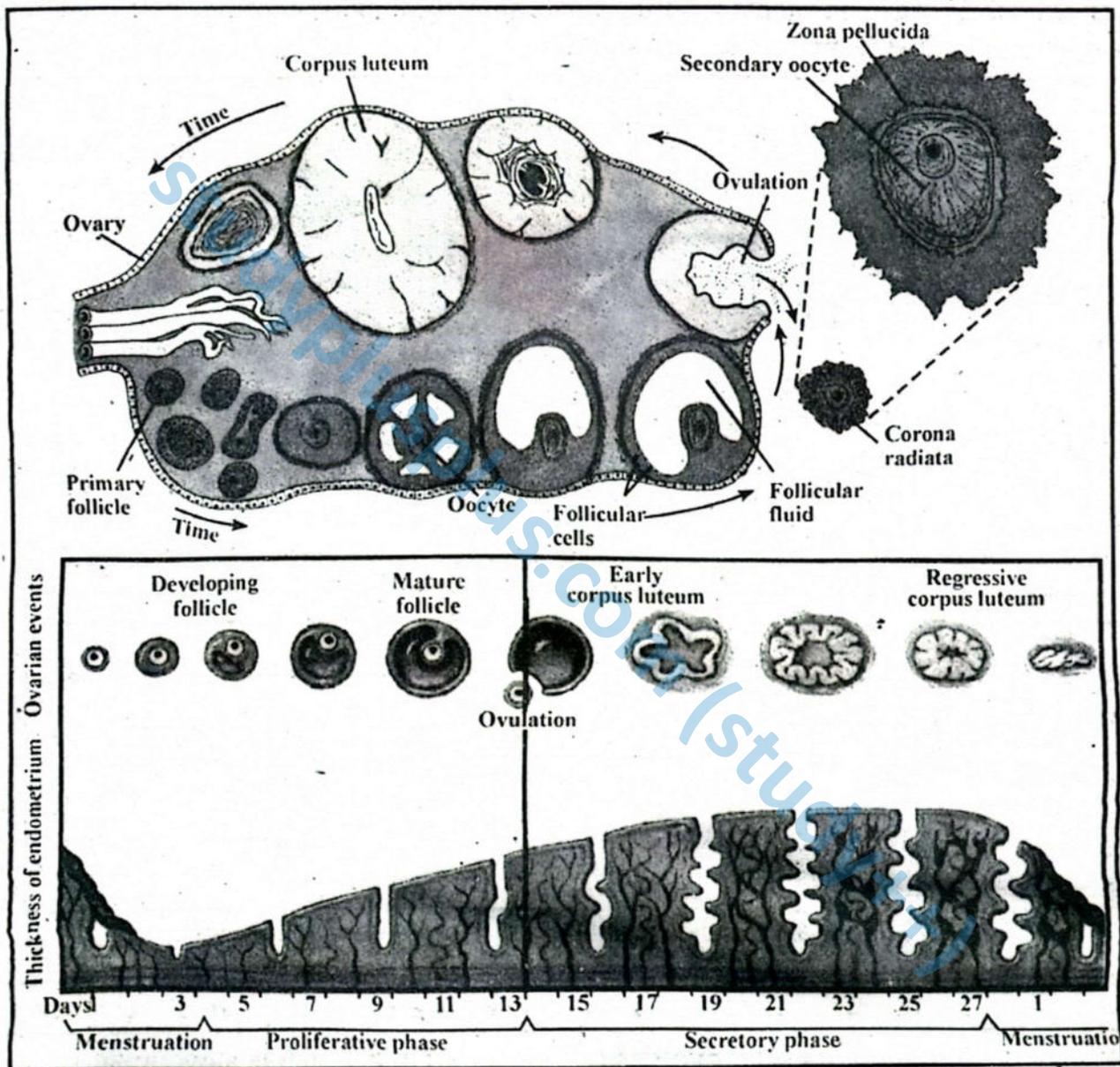


Fig. The ovarian and uterine cycles in human female

The release of a secondary oocyte (ovulation) is timed to coincide with the thickening of the lining of the uterus. The uterine cycle in humans involves the preparation of the uterine wall to receive the embryo if fertilization occurs. Knowing how these two cycles compare, it is possible to determine when pregnancy is most likely to occur.

2. During this time the growing follicle secretes estrogens which is increased in blood stream. The target of the estrogen is to stimulate the production of internal lining of uterus wall called endometrium. The cell layers of endometrium are soon highly vascularized which is required for fetus. Estrogen also inhibits the production of FSH from pituitary gland.
3. Decrease of FSH and increase of estrogen causes the pituitary gland to secrete leutinizing hormone (UH) release the ovum from follicle. This is called ovulation.
4. As the egg is released from the follicle, the follicle under the influence of LH forms a new body called corpus lumen. (corpus, body, luteum yellow). The corpus luteum continues its secretion of estrogens and in addition secretes progesterone. The progesterone develops the endometrium and makes it receptive for implantation of zygote (placenta formation).
5. The fertilization does not occur, the corpus luteum starts degenerating. The progesterone secretion diminishes and its supporting affect on spongy endometrium is reduced, which suffers a breakdown. This causes the discharge of blood and cell debris known as menstruation. This stage lasts for 3-7 days.

Menopause:

The end or complete cession of menstrual cycle is called menopause after which female stops producing ova.

Effects on the Cycle:

The female reproductive cycle can be affected by different factors due to which it may not complete in normal 28 days. The factors are in nourishment and emotional stresses.

Q.11. Discuss the process of birth of human embryo.

Ans. The total gestation period (pregnancy) is usually about 280 days.

MAINTENANCE OF PREGNANCY:

A placenta is developed between the wall of uterus and foetal tissues. Placenta secretes progesterone which maintains pregnancy. If progesterone is not secreted properly then it may cause premature birth or miscarriage.

Protection of embryo:

Human embryo is protected in amniotic filled sac which contains amniotic fluid. Amniotic fluid is not only protective but also shock absorptive.

Despite the great changes that have occurred for, the embryo will not be clearly recognizable as human until eight weeks of pregnancy. At beginning of 3rd month the embryo technically becomes fetus. Most of major organs are formed by 12th week of pregnancy and the remainder of gestation period is taken up by growth.

Lactation:

During this period pituitary gland produce hydrotropic hormone (LTH) Placenta also secretes human placental lactogen. Both these hormones stimulate mammary development in preparation for lactation.



BIRTH OF THE CHILD:

At start it was thought that hormonal activities within the mother i.e. decrease in progesterone level onset the birth. But recent evidence suggests that there is a high degree of fetal involvement in timing of birth. Birth process can be divided into three stages.

1. Dilation:

This is the first stage of birth. This is a result of stimuli from fetal pituitary. The ACTH released from the fetal pituitary stimulates fetal adrenal gland to release corticosteroids which cross the placental barrier and enter the maternal blood circulation causing a decrease in progesterone production. The reduction of progesterone level stimulates pituitary gland to produce oxytocin hormone. This induces labour pains i.e. contraction of uterus wall. The release of oxytocin occurs in 'waves' during labour and provide the force to expel the fetus from uterus.

(ii) Expulsion:

Stage two is expulsion during which fetus is delivered.

The cervix dilates and uterine contractions spread down over uterus and are strongest from top to bottom. This is helpful in pushing the baby down ward allowing the delivery of baby.

(iii) Separation:

The final stage is separation of umbilical cord and baby is released from mother.

After Birth:

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

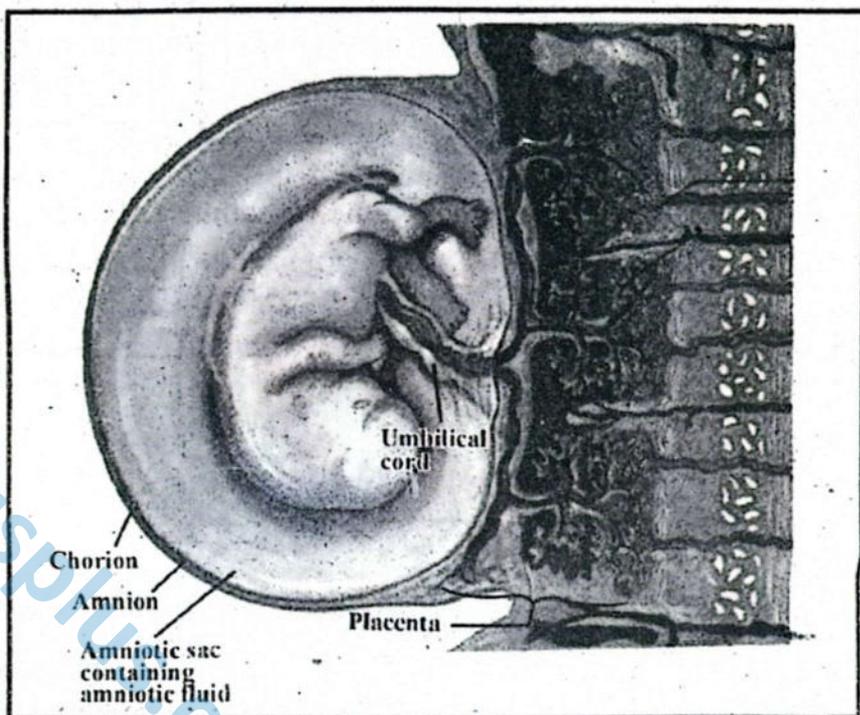


Fig. Placental structure

The embryonic blood vessels that supply the developing child with nutrients and remove the metabolic wastes are separated from the blood vessels of the mother. Because of this separation, the placenta can selectively filter many types of incoming materials and microorganisms.

Q.12. What do you know about test tube babies?

Ans. Those parents which are unable to have normal process of fertilization and birth due to some abnormalities in any of two parents can have test tube babies.

Procedure:

Parent sperm and ovum is fertilized in vitro (outside the female body) and then the zygote is implanted back in other uterus, placenta establishes and remaining development takes place in body of mother leading to normal birth.

Q.13. Explain different types of sexually transmitted diseases.

Ans. The sexually transmitted diseases (STD) can be transmitted from carrier to healthy persons. These are the following:

1. GONORRHEA:

Gonorrhoea also called cap is caused by gram-positive bacteria *Neisseria gonorrhoeae*. It affects the mucous membrane of urinogenital tract. The newborn infant may cause serious eye infections if they pass through infected birth canal. It is highly contagious through sexual contacts.

2. SYPHILIS:

It is caused by spirochete *Treponema pallidum*. This disease damages the reproductive organs, eyes, bones, joints, central nervous system, heart, skin. Sexual contact is the major source of this disease.

3. GENITAL HERPES:

It is caused by Herpes simplex type 2 virus. It produces genital soreness and ulcers in the infected areas. In infected pregnant woman, virus can be transmitted to infant during birth causing damage to eyes and CNS of infant. The major cause is sexual contact causing infection of genitalia.

4. AIDS (ACQUIRED IMMUNE DEFICIENCY) SYNDROME:

This disease is caused by HIV virus. In this disease the body's immune system is suppressed. As this disease progresses the susceptibility of all sorts of diseases increases.

Sexual contacts are one of the sources of its spread.

Control of the Diseases:

All the above mentioned diseases can be controlled and prevented by avoiding sexual contacts with carrier or disease person and adopting hygienic conditions.



◀ SOLVED EXERCISE ▶

Q.1: Fill in the blank with appropriate words.

- (i) Asexual reproduction requires only a single _____ organism.
(ii) Sexual reproduction usually involves _____ parents.
(iii) Phytochromes are the special _____ sensitive pigments.
(iv) External fertilization occurs in _____ environment.
(v) _____ and _____ animals provide more protection to their young one during development.
(vi) A placenta is established between the uterine and _____ tissues for the exchange of oxygen.
(vii) The reduction of progesterone level, stimulates the _____ gland to produce oxytocin hormone.

Ans. (i) Parental (ii) Two (iii) Light
(iv) Aquatic (v) Viviparous, Ovoviviparous
(vi) Foetal (vii) Pituitary

Q.2 Write whether the statement is true or false and write the correct statement if false.

- (i) Asexual reproduction involves mitotic cell division. **True**
(ii) Asexually produced offsprings are genetically identical to their parents. **True**
(iii) Sexual reproduction involves single parent. **False**
True: Sexual reproduction involves two parents.
(iv) Sexually produced offspring are identical to their parent. **False**
True: Sexually produced offspring are not identical to their parent.

Q.3. Each question has four options. Encircle the correct answer.

- (i) **Reproduction is every important to the survival of**
(a) species (b) individual
(c) population (d) both a and b
- (ii) **In plants photoperiod and temperature affect**
(a) flowering (b) buds and seed dormancy
(c) fruit and seed production (d) all a, b, c,
- (iii) **Developing seeds are rich source of**
(a) auxins (b) cytokinin
(c) gibberellins (d) all a, b, c,

- (iv) **Common methods of asexual reproduction are**
 (a) tissue culturing (b) identical twins
 (c) cloning (d) all a, b, c,
- (v) **Photoperiod affect flowering when shoot meristem start producing.**
 (a) floral buds (b) leaves
 (c) lateral bud (d) b and c
- Ans.** (i) (a) (ii) (a) (iii) (a)
 (iv) (d) (v) (a)

Q.4. Short Question?

- (i) **What changes occur in ovulation and menstruation during pregnancy?**
Ans. Ovulation and menstruation stops during pregnancy and progesterone hormone starts working.
- (ii) **What is the difference between oogenesis and spermatogenesis in human?**
Ans. In oogenesis ova are produced which are one in number while in spermatogenesis sperms are produced which are four in number.
- (iii) **How a seed is formed?**
Ans. Male and female gametes of plants fertilize to form zygote. The zygote develops into embryo which is covered by seed coat and thus seed is formed.
- (iv) **What is importance of seed in the life cycle of a plant.**
Ans. Seed products the plants in embryonic condition. These are the units by means of which plants are being rooted and dispersed to new places.

Q.5. Extensive Questions?

- (i) **What structure are associated with the human female reproductive system? What are their function?**
Ans. Please See Q No. 9
- (ii) **What are the function of placenta during pregnancy.**
Ans. Please See Q No. 11
- (iii) **Describe human menstrual cycle?**
Ans. Please See Q No. 10
- (iv) **Write notes on the following?**
 (a) Parthenogenesis
 (b) Herpes Genetalia
 (c) Asexual reproduction
 (d) Seedless fruits

Ans. (a) Parthenocarpy:

In some plants fruit is developed with out fertilization and no seed is produced. This type of development is called parthenocarpy.

Parthenocarpy occurs due to normal imbalance. Usually high auxin is also induced artificially. The plants which show parthenocarpy are banana, pineapple etc.

(b) Herpes Genetilia:

It is caused by Herpes simplex virus. It produces genital soreness and ulcers in the infected areas. In infected pregnant woman, virus can transmitted to infant during birth causing damage to eyes and CNS of infant.

(c) Asexual Reproduction:

Asexual reproduction does not involve the production of gametes and requires only single parent. The offspring is produced through mitosis and he is genetically identical to his parent. Different methods of asexual reproduction are fission, parthenogenesis, budding etc.

(d) Seedless Fruits:

In some plants fruit is developed with out fertilization and no seed is produced. This type of development is called parthenocarpy.

Parthenocarpy occurs due to normal imbalance. Usually high auxin is also induced artificially. The plants which show parthenocarpy are banana, pineapple etc.

