

CHAPTER 18

Q.1 Differentiate between oogonia and oocyte.

Ans. Oogonia are diploid mother cells and they undergo meiosis. the oocytes are haploid eggs.

Q.2 What is ovulation? Which hormone does cause it?

Ans. The discharge of ovum from the ovary is called ovulation. Ovulation is caused by LH.

Q.3 What is placenta? Give its functions.

Ans. A placenta is connection established between the uterine and foetal tissues for the exchange of oxygen, carbon dioxide, waste, nutrients and other materials.

Q.4 What is fetus?

Ans. Human embryo is called the fetus from 3rd month of pregnancy.

Q.5 What are sexually transmitted diseases? Why are they spread?

Ans. The diseases which spread through sexual contacts are called sexually transmitted diseases. Unhealthy attitudes and low moral values cause these diseases to spread.

Q.6 What are advantages of viviparous and ovoviparous conditions?

Ans. Viviparous and ovoviviparous animals provide more protection to their young ones during development. Nourishment is provided through stored food in the egg or through placenta by the mother.

Q.7 What are sertoli cells in testis?

Ans. The sertoli cells secrete a fluid. This fluid provides liquid medium, protection and nourishment to sperms while they are in the tubules.

Q.8 Differentiate between primary spermatocytes and secondary spermatocytes.

Ans. Primary spermatocytes are diploid while secondary spermatocytes are haploid.

Q.9 What is Epididymis?

Ans. The first part of the vas deferens forms highly convoluted Epididymis.

Q.10 What is oestrous and oestrous cycle?

Ans. The females exhibits the desire for mating or is said to be on heat or oestrous. The physiological changes which take place between two heats or estrous is called oestrous cycle.

Q.11 Differentiate between menstrual and oestrous cycles.

Ans. The menstrual cycle involves periodic changes in the structure and function of the whole reproductive system in the female. e.g., humans. The physiological changes which takes place between two heats or estrous is called oestrous cycle, e.g., sheep.

Q.12 What is seed dormancy? Give its advantages.

Ans. The inactivity of seed during unfavourable conditions is called seed dormancy. It is the special condition of rest. It enables an embryo to survive the long periods of unfavourable environmental conditions. During this period of rest the embryo ceases or limits its growth.

Q.13 What is the role of auxins in seed and fruit formation?

Ans. Auxins are necessary for 'fruit set', i.e., retention of the ovary. The ovary becomes fruit after fertilization. Without auxins the abscission of flowers normally occurs.

Q.14 What are the role of Gibberellins and cytokinins in the fruit and seed development?

Ans. Developing seeds are rich source of auxins, gibberellins and cytokinins. These growth substances are mainly associated with development of the embryo and accumulation of food reserves in the seed or in the pericarp.

Q.15 What is role of ethene in fruit formation?

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

Q.16 What is climatic?

Ans. The respiratory activity starts rapidly during ripening of fruit. It is called the climatic.

Q.17 What are P660 and P730? How they are mutually converted into each other?

Ans. P660 is a quiescent (inactive) phytochrome. It absorbs red light of wavelength of 660 nm and is converted to active P730. P730 absorbs far red light at 730 nm and is converted to P660. It is an active phytochrome.

Q.18 How do the P730 and P660 affect the flowering in short day and long day plants?

Ans. The P730 – P660 inter conversion may be the plant time-regulator for flowering. Long day plants produce flower in presence of active P730. The short day plants produce flower in the presence of P660.

Q.19 What is the role of florigen in flowering?

Ans. The biological clock once stimulated by interconversions of phytochromes. It produces florigen hormone in leaves. Florigen travels through phloem of the leaves to the floral buds and initiate flowering.

Q.20 What is the difference between positive and negative feed back?

Ans. Many molecular and physiological processes are controlled by feedback mechanisms. In a feedback loop the product of a process, such as the breakdown of proteins into amino acids, has an effect on the rate of the process. Negative feedback occurs when the rate of the process decreases as the concentration of the product increases. Positive feedback occurs when the rate of a process increases as the concentration of the product increases. Negative feedback controls the rate of a process to avoid accumulation of a product. The rate of a process will continuously accelerate under positive feedback as long as substrate is available and the product is not consumed by some other process.

Q.21 What is corpus luteum?

Ans. Corpus Luteum:

In ovary, the surroundings of the ovum becomes enlarged after releasing the ovum. The morphological and physiological changes of follicular cells are called **Luteinisation**.

Function:

It secretes progesterone which controls the length of the reproductive cycle as well as maintains pregnancy.

Q.22 What is menopause?

Ans. Menopause:

Cessation of menstruation is called menopause.

Cause of Menopause:

The cause of menopause is related to a decreasing ability of aging ovaries to respond **FSH** and **LH**.

As a result there is a decrease in the production of estrogens by the ovaries.

Q.23 What do you know about estrogen and progesterone?

Ans. Estrogen and Progesterone:

These are hormones which are found in human females. Chemically, these are steroids.

- ◆ Menstrual cycle is regulated by estrogen and progesterone.
- ◆ These are secreted from the ovary.
- ◆ The ovarian hormone secretion is controlled by the gonadotrophin, FSH and LH, from the pituitary gland.
- ◆ Estrogen promotes the growth of uterine smooth muscles i.e. **myometrium** and the **endometrium**.

Endometrium consists of uterine epithelium, glands and connective tissues.

- ◆ In case of *non-pregnant* female, progesterone is secreted by the corpus luteum.
- ◆ During *pregnancy* progesterone is formed by placenta.
- ◆ *At birth* estrogen and progesterone levels fall due to loss of placenta.

Q.24 What are Cowper's glands?

Ans. Cowper's Gland:

It secretes mucus and an alkaline fluid into the urethra.

The alkaline fluid neutralizes the acidity of any remaining urine.

Q.25 What is pineal gland? Describe its functions?

Ans. The pineal gland is a pine cone shaped gland of the endocrine system. A structure of the diencephalon of the brain, the pineal gland produces several important hormones including melatonin

The pineal gland is involved in several functions of the body including:

- ◆ Secretion of the Hormone Melatonin
- ◆ Regulation of Endocrine Functions
- ◆ Conversion of Nervous System Signals to Endocrine Signals
- ◆ Causes Feeling of Sleepiness
- ◆ Influences Sexual Development

Q.26 How a test tube baby is produced?

Ans. Test Tube Baby:

It is the biological technique for those parents which are unable to enjoy normal process of their offspring. This is due to some physiological and physical abnormalities in any of the two parents.

Method:

Parental sperm and ovum is fertilized in vitro-outside the female body. 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.

Q.27 What are ovaries?

Ans. Ovaries:

The two ovaries are the female gonads, the sites where the female gametes are made. The gametes are known as eggs or ova.

(Biologists and the medical profession usually refer to them as eggs.) The ovaries are *almond-shaped*, measure about 3-5 cm long, and 2-3 cm wide and also *secrete the female sex hormones oestrogen and progesterone*.

Usually, one egg is produced every month during the fertile years of a woman.

The outermost layer of cells of the ovary is composed of *germinal epithelial* cells from which gamete cells are produced.

The outer region of the ovary is composed of developing follicles and the middle is composed of **stroma**, which contains connective tissue, blood vessels and mature follicles.

Q.28 What are oviducts?

Ans. Oviducts or Fallopian Tubes:

The tubes are about 12 cm long and carry eggs from the ovaries to the uterus.

The ends of the tubes nearest the ovaries have feathery processes called **fimbriae**. They move closer to the ovaries at ovulation. Cilia lining the *imbrue* beat and cause a current

which draws in the ovum or egg (more precisely the secondary oocyte) after it is released from the ovary.

Cilia lining the oviduct beat and smooth muscle contract causing peristaltic movements which move the egg down the oviduct to the uterus.

If fertilization takes place it occurs in the oviduct.

Q.29 What do you know about cervix?

Ans. Cervix:

This is the narrow entrance to the uterus from the vagina.

It is normally blocked by a plug of mucus and a ring of muscles can close it.

Q.30 What do you know about epididymis?

Ans. Epididymis:

The epididymis is a very **coiled tube**, about **6 m long**, pressed against the testis.

Sperms take several days to pass through this tube. Sperms are concentrated here to about 5000 million per cm^3 by reabsorption of fluid secreted originally by the seminiferous tubule.

They also develop the ability to swim, although they are inhibited from doing so until after ejaculation.

Sperms pass to the base of the tube for a short period of storage before entering the vas deferens.

Chemicals produced by the lining of the tube are essential for maturation of the sperms.

Q.31 What is vas deferens?

Ans. Vas Deferens (*Plural Vasa Deferentia*):

This is a straight tube about 40 cm long which *carries sperms to the urethra*. Most of the sperms are stored in the vas deference.

Q.32 What is prostate gland?

Ans. Prostate Gland:

The prostate gland also secretes mucus and a slightly alkaline fluid which is released during ejaculation and **helps to neutralize the acidity of the vagina**, making the sperm more active.

Q.33 What is difference between placenta and umbilical cord?

Ans. The **placenta** is a spongy mass of flesh that absorbs oxygen and nutrients from the blood stream of the mother. The **umbilical cord** is the set of veins etc. that carries those to the fetus. When the baby is born, the umbilical cord is attached at the belly button and is cut free. The placenta releases from the uterus because of the chemical changes that are part of labor is ejected or pulled from the mother by pulling on the umbilical cord.

Q.34 What is uterus?

Ans. Uterus (Womb):

The uterus is **about 7.5 cm long** and **5 cm wide** and is about the size and shape of an inverted pear.

It is **behind the bladder**. If fertilization takes place, the **embryo implants** in the wall of the uterus and grows there until birth.

The uterus grows much large during pregnancy.

The outer layer of the uterus wall, the **myometrium**, contains smooth muscle which contracts strongly during birth.

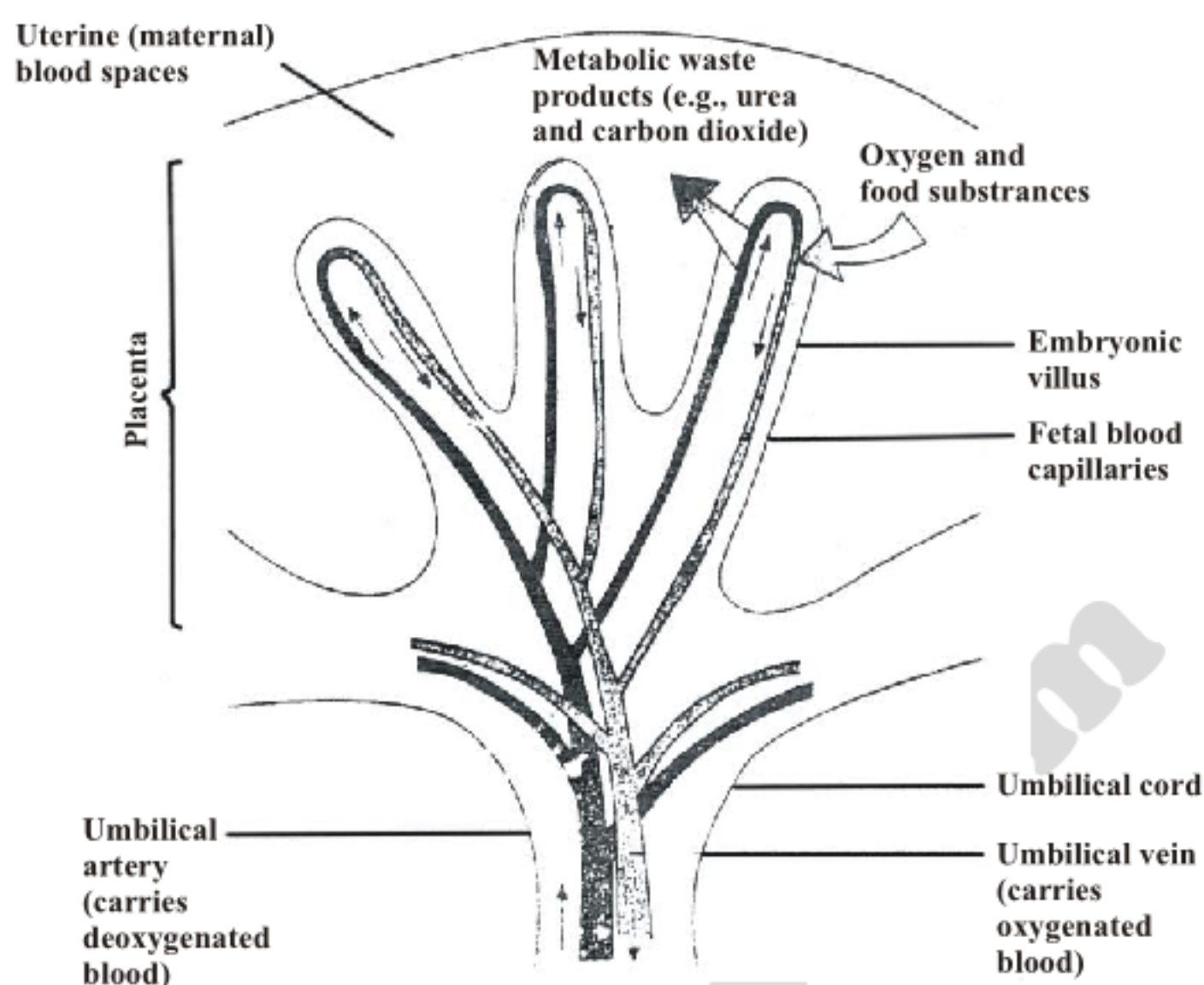
The inner layer, the **endometrium**, contains glands and many blood vessels.

Q.35 Write about placenta and umbilical cord.

Ans. The Placenta:

- ◆ Allows dissolved food substances (e.g., glucose, amino acids, mineral salts) and oxygen to diffuse from the mother's blood into that of the embryo.
- ◆ Allows metabolic waste products (e.g., urea and carbon dioxide) to diffuse from the embryonic blood capillaries into the mother's bloodstream.
- ◆ Allows antibodies to diffuse from the mother's blood into the embryonic blood capillaries. The antibodies protect the embryo against certain diseases.
- ◆ Produces progesterone which maintains uterine lining in healthy state during pregnancy.

The embryo is attached to the placenta by a tube known as the *umbilical cord* which contains the blood vessels of the embryo. It contains two *umbilical arteries* that carry deoxygenated blood from the fetus to the placenta. It also contains one *umbilical vein* that transports oxygenated blood and food substances from the placenta to the fetus. When the main organs of the embryo have been formed, the young mammal is known as a fetus. The fetus continues to grow in the uterus. At the end of nine months of pregnancy, the baby is fully formed and is ready to be born.



Q.36 Describe embryo, fetus and gestation period.

Ans. The zygote divides by mitosis to form a ball of cells known as the embryo. The embryo continues to divide and develop. In humans, about 10 to 12 weeks time after fertilization, all the major organs are formed. From this stage onwards, the embryo is known as a fetus.

The period from fertilization (concentration) to birth is known as the gestation period. This period varies – for humans it is 38 weeks, elephants 1 year and 9 months, and mice only 19 days.

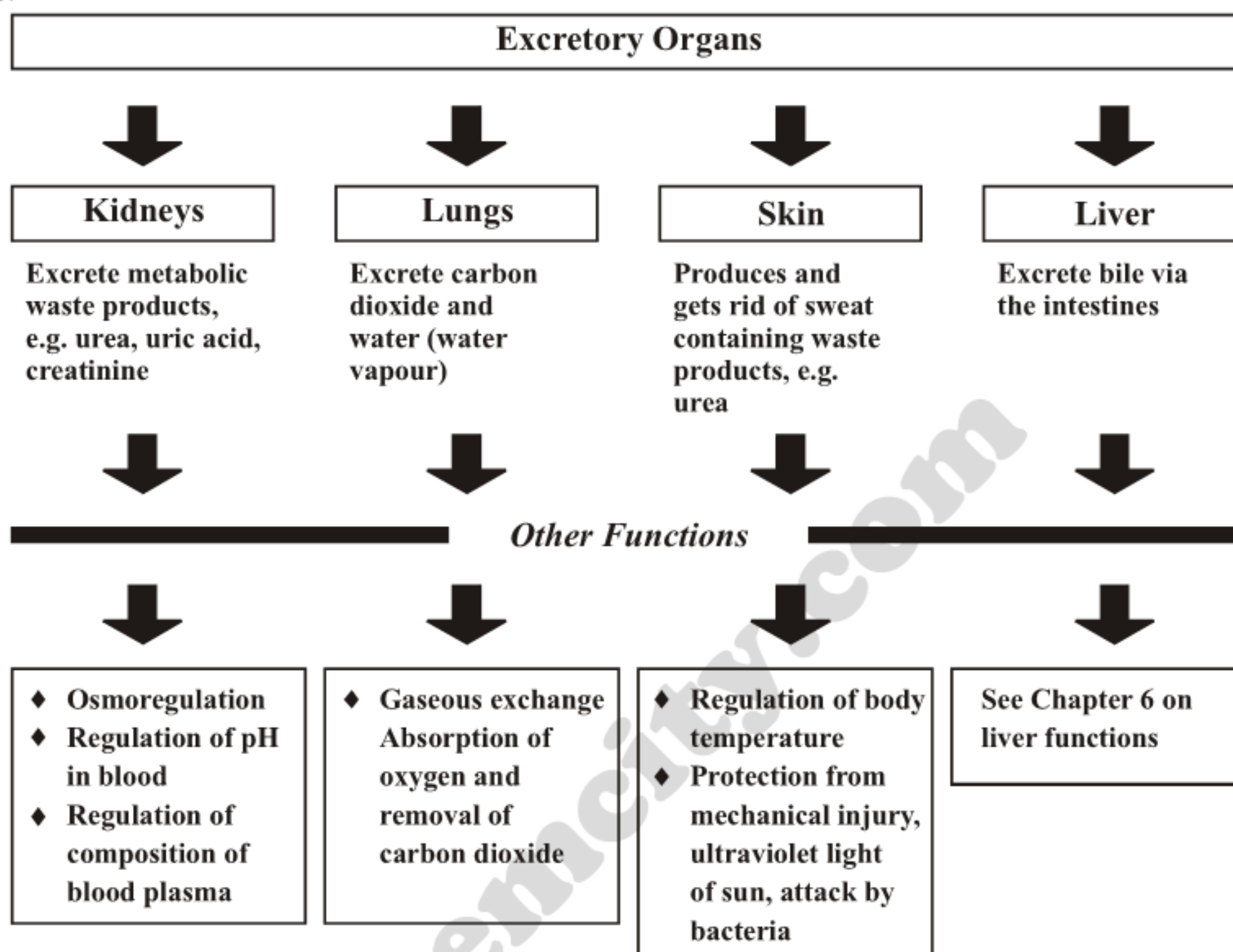
Q.37 Write down summary of the effects of red light and far-red light.

Ans.

Red light effects	Far-red light effects
Phytochrome 660 changes to phytochrome 730.	Phytochrome 730 changes to phytochrome 660.
Stimulates germination of some seeds, e.g., lettuce (<i>Lactuca</i>).	Inhibits germination of some seeds, e.g., lettuce (<i>Lactuca</i>).
Induces formation of anthocyanine (plant pigments).	Inhibits formation of anthocyanine.
Stimulates flowering in long-day plants.	Inhibits flowering in long-day plants.
Inhibits flowering in short-day plants.	Stimulates flowering in short-day plants.
Elongation of internodes is inhibited.	Elongation of internodes is promoted.
Induces increase in leaf area.	Prevents increase in leaf area.
Causes epicotyl (plumule) hook to unbend.	Maintains epicotyl (plumule) hook bend.

Q.38 Write the concept map on removal of metabolic waste products and toxic substances from the body.

Ans.



☐ The urinary system consists of a pair of kidneys, ureters, bladder and urethra.

- ◆ The kidney consists of a fibrous capsule, cortex, medulla consisting of pyramids and renal pelvis.
- ◆ The kidney contains numerous tubules called nephrons. Each nephron consists of a renal (Bowman's) capsule containing the glomerulus, first (proximate) convoluted tubule, loop of Henle and second (distal) convoluted tubule.

☐ Urine formation involves ultrafiltration and selective reabsorption of useful materials.

- ☐ Osmoregulation is the regulation of the water or salt concentrations in the blood to keep the water potential of the internal environment constant.
- ◆ The amount of water reabsorbed by the kidney tubules depends on the amount of ADH secreted.

Q.39 Write organs of vegetative propagation.

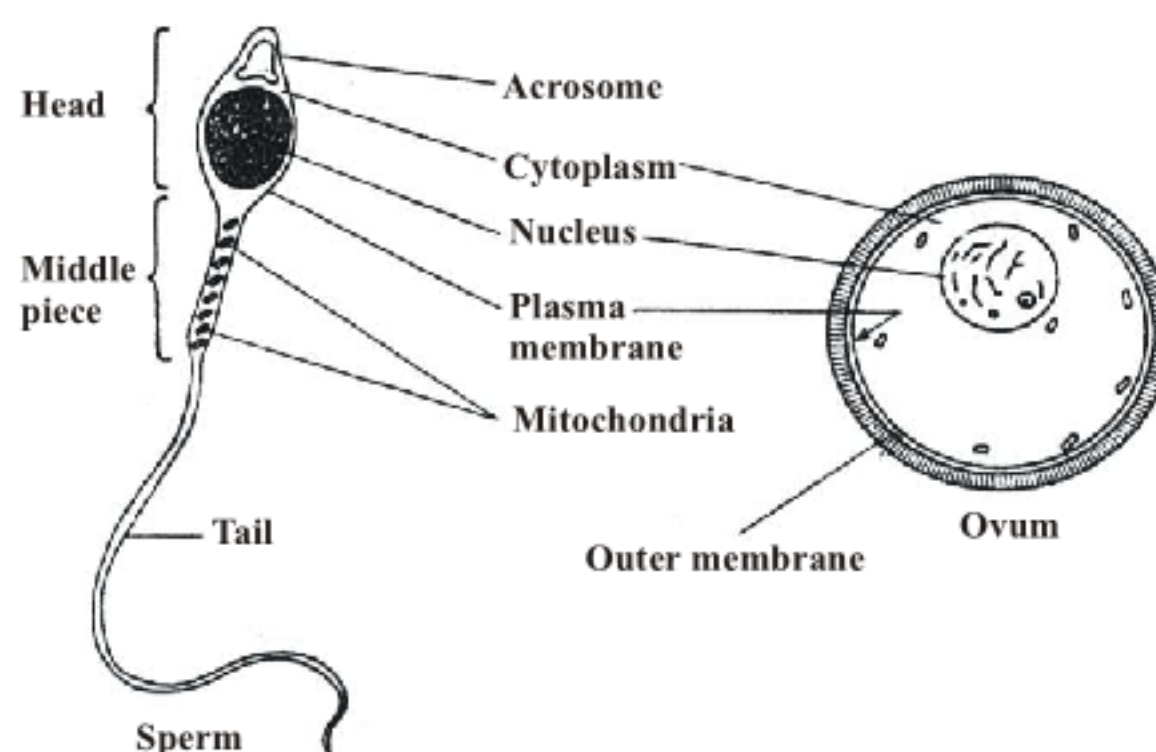
Ans.

Organs of Vegetative Propagation and Perennation

Name	Example	Description of organ	Mechanism of action	Perennating organ
Bulb	Onion Garlic Daffodil Tulip	Underground, swollen, fleshy leaf-bases closely packed on a short stem, i.e., a bud	Apical and axillary buds among the leaves each give rise to more new plants.	Yes
Corm	Crocus Montbretia Gladiolus Cyclamen	Underground, vertical swollen base of main stem	Buds develop in the axils of the scale leaves surrounding the corm. Each may develop into a new plant.	Yes
Rhizome	Solomen's seal Iris Couch grass Canna	Underground horizontal branching stem	Stem grows and branches. At the tip of each branch a bud produces new vertical growth which gives rise to a new plant.	Yes
Stem tuber	Potato Artichoke	Swollen tip of slender rhizome	Many slender rhizomes arise from axil of scale leaf. The tips swell to form a stem tuber, each giving rise to a new plant	Yes
Suckers	Mint Pear	Underground horizontal branches	A number of underground branches radiate laterally from the parent plant. The tips ultimately turn upwards out of the soil the develop into new plants.	Yes
Runner	Creeping buttercup Strawberry	Thin lateral stems on the soil surface	A number of stems radiate from the parent plant. Adventitious roots arise at points along the stem and new plants arise from these.	No
Offset	Leek	A short, stout lateral stem on the soil surface	Stem grows laterally along the soil and a single plant arises from a bud at the top of each stem.	No
Stolon	Blackberry	A long vertical stem with little structural support	The stem grows vertically at first but then bends over until the tip touches the soil. Adventitious roots develop and at this point a new plant arises from a nearby lateral bud.	No
Root tuber	Dahlia	Swollen fibrous root	The tuber stores food but the new plant arises from an axillary bud at the base of the old stem.	Yes

Q.40 Draw structures of a mammalian sperm and an ovum.

Ans.



Q.41 What is difference of meiosis between animals and plants?

Ans. Meiosis takes place during gamete formation in animals. But in plants meiosis takes place during spore formation and gametes are formed by mitosis.

Q.42 What is diplohaplontic life cycle?

Ans. In this case, diploid sporophyte and haploid gametophyte generations alternate with each other.

Q.43 Differentiate between isomorphic and heteromorphic alternation of generation.

Ans. In case of isomorphic life cycle, the two generations are vegetatively similar. In case of heteromorphic life cycle, the two generations are dissimilar.

Q.44 Give different adaptations in plants for sexual reproduction.

Ans. Modification of flower and inflorescence for pollination. Transfer of gamete by pollen tubes. Food storage for developing embryo. Protection of seed by seed coats. Dispersal of seed with the help of fruit formation.

Q.45 What is pollen tube? Give its importance for land plants.

Ans. Pollen tube acts as vehicle for the safe transport of male gametes to female gamete in land environment. Evolution of pollen tube is parallel to the evolution of seed. It is a tool for the success of seed plants.

Q.46 What is a vernalin? What is its chemical nature?

Ans. Vernalin is a hormone which induces vernalisation. It is now believed that vernalin is actually gibberellins.

Q.47 Give significance of photoperiodism and vernalisation.

Ans. Both these processes synchronize the reproductive behavior of plants with their environment. These also ensure that members of the same species flower at the same time. They encourage cross pollination for genetic variability.

Q.48 What are Bisexual or hermaphrodite animals and plants?

Ans. They have both the sexes in the individuals. In plants bisexuality is generally retained. Despite the bisexuality (tape worm, earthworm etc.), cross fertilization takes place. It maintains the genetic recombination.

Q.49 Differentiate between external and internal fertilization.

Ans. The fertilization takes place inside the female body e.g. in water is called external fertilization like frog. The fertilization takes place within the body of female is called internal fertilization like man.

Q.50 What is follicle atresia?

Ans. Only one of the follicles continues to grow with its primary oocytes while the remaining follicles break down by a degenerative process known as follicle atresia.

Q.51 What is corpus luteum? What is its function?

Ans. The follicle cells, after release of the egg, are modified to form a special structure called corpus luteum. It is yellowish glandular structure. It starts secreting a hormone called progesterone.

Q.52 What are phytochromes?

Ans. The plant shows response to light intensity and quality. It leads to the discovery of a red light sensitive protein pigments. These proteins are called phytochromes.

Q.53 Differentiate between asexual and sexual reproductions.

Ans. The reproduction without production and fusion of gametes is called asexual reproduction. The reproduction in which formation and fusion of gametes take place is called sexual reproduction.

Q.54 What are disadvantages of asexual reproduction?

Ans. Asexual reproduction increases the number of genetically alike individuals from a parent very rapidly. It may at some stage jeopardize the survival of a species.

Q.55 Give the importance of asexual reproduction for man.

Ans. Man uses asexual reproduction for his own needs. He commonly performs tissue culturing in plants and cloning in animals. These techniques are used to produce organisms of valuable characteristics.

Q.56 What is after birth?

Ans. The uterus contracts 10-45 minutes after birth and separates the placenta from the wall of the uterus. The placenta then passes out through the vagina. This is called after birth.

Q.57 Differentiate between haploid and diploid parthenogenesis.

Ans. In case of haploid parthenogenesis, the haploid egg develops into haploid offspring. In case of diploid parthenogenesis, self induced diploid egg develops into diploid offspring.

Q.58 What is apomixes?

Ans. In this case a diploid cell of the ovule, either from the nucleus or megaspore, develops into a functional embryo in the absence of a male gamete.

Q.59 What is tissue culturing? Which part of the plant is grown in this technique?

Ans. The culturing of tissues for reproducing new identical varieties is called tissue culture. In this technique, cambium tissues of plants are excised from plants ends and are cultured.

Q.60 Differentiate between identical and non-identical twins.

Ans. The twins produced by the splitting of blastomere during cleavage are called identical twin. They are completely identical. The twins produced by the fertilization of two eggs are called non-identical twins.

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