Life Processes in Living Organisms Part-2

Exercise

Q. 1. Complete the following chart.

Asexual reproduction	Sexual reproduction
1. Reproduction that occurs with the help of somatic cells is called as Asexual Reproduction.	1.
2	2. Male and female parent is necessary for sexual reproduction.
3. This reproduction occurs with the help of mitosis only.	3
4	4. New individual formed by this method is genetically different from parents.
5. Asexual reproduction occurs in different individuals by various methods like binary fission, multiple fission, budding, fragmentation, regeneration, vegetative propagation, spore production, etc.	5

Answer :

ASEXUAL REPRODUCTION	SEXUAL REPRODUCTION
1. Reproduction that occurs with the help of somatic cells is called as Asexual Reproduction.	1. Reproduction that occurs with the help of gamete cells.
2. Male and female parent is not necessary for asexual reproduction	2. Male and female parent is necessary for sexual reproduction.
3. This reproduction occurs with the help of mitosis only.	3 This reproduction occurs with the help of meiosis and mitosis
4 New individuals formed by this method is genetically same	4. New individual formed by this method is genetically different from parents.
5. Asexual reproduction occurs in different individuals by various methods like binary fission, multiple fission, budding, fragmentation, regeneration, vegetative propagation, spore production, etc.	5 Sexual reproduction occurs in different individuals by same methods like gamete formation and fertilization

Q. 2. Fill in the blanks.

a. In humans, sperm production occurs in the organ ----------.
b. In humans, ------ chromosome is responsible for maleness.
c. In male and female reproductive system of human, ---------- gland is same.
d. Implantation of the embryo occurs in ------
e. ---------- type of reproduction occurs without fusion of gametes.
f. The body breaks up into several fragments and each fragment starts to live as a new individual. This is -- -- -- -- -- -- -- type of reproduction.
g. Pollen grains are formed by -- ----- -- -- -- division in locules of anthers.

Answer : a. Testes,

Explanation: Testes are situated in the scrotum, outside the abdominal cavity. Testes contain numerous seminiferous tubules which consists of germinal epithelium it divides by meiosis to produce sperms.

b. Y chromosome.

Explanation: Men have XY sex chromosomes

and women have XX sex-chromosomes. A reproductive system with specific organs develops in the body of men and women due to these sex-chromosomes only. X-chromosome is present in both whereas Y-chromosome is present in men only.

c. Pituitary gland.

Explanation: Follicle stimulating hormone(FSH), Luteinizing hormone(LH) are the hormones found in male and females. FSH stimulates testicular growth in male's LH is also called interstitial cell-stimulating hormone (ICSH), it stimulates Leydig cell production of testosterone. It acts synergistically with FSH. In females, an acute rise of LH ("LH surge") triggers ovulation and development of the corpus luteum.

This hormone stimulates the growth of ovarian follicles in the ovary before the release of an egg from one follicle at ovulation.

d. Oviduct.

Explanation: Formation of a zygote by the union of sperm and ovum is called as fertilization. It is internal in humans. Semen is ejaculated in the vagina during copulation. This semen consists numbers of few millions start their journey by the route of vagina – uterus – oviduct. One of those few million sperms fertilizes the only ovum present in the oviduct.

e. Asexual.

Explanation: The process of formation of a new organism by an organism of same species without the involvement of gametes is called as asexual reproduction. This reproduction does not involve the union of two different gametes, therefore, the new organism has exact genetic similarity with the reproducing organism.

f. Fragmentation.

Explanation: This type of asexual reproduction occurs in multicellular organisms; the body of parent organism breaks up into many fragments and each fragment starts to live as an independent new organism. This type of reproduction occurs in algae like Spirogyra, and sponges.

g. meiosis

Explanation: Meiosis takes place in locules of anther which forms haploid pollen grains.

Q. 3. Complete the paragraph with the help of words given in the bracket.

(Luteinizing hormone, endometrium of uterus, follicle stimulating hormone, estrogen, progesterone, corpus luteum)

Answer : Growth of follicles present in the ovary occurs under the effect of follicle stimulating hormone. This follicle secretes estrogen. Endometrium of uterus grows / regenerates under the effect of estrogen. Under the effect of estrogen fully grown up

follicle bursts, ovulation occurs and corpus luteum is formed from remaining part of follicle. It secrets progesterone and estrogen.

Under the effect of these hormones, glands of endometrium of uterus are activated and it becomes ready for implantation.

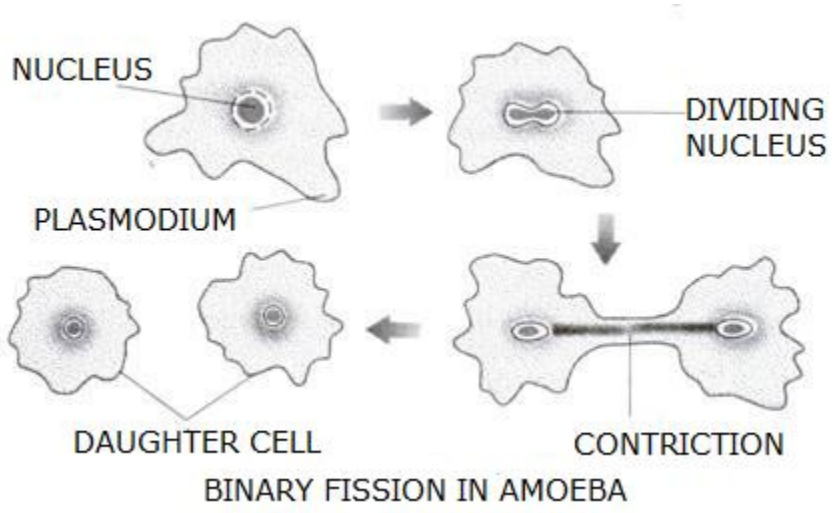
Q. 4. A. Answer the following questions in short.

Explain with examples types of asexual reproduction in unicellular organism.

Answer : Asexual reproduction in unicellular organisms

1. Binary Fission:

The parent cell divides to form two similar daughter cells is called Binary fission. It occurs either by mitosis or amitosis.eg: Prokaryotes (Bacteria), Protista (Amoeba, Paramecium, Euglena, etc.) and eukaryotic cell-organelle like mitochondria and chloroplasts perform asexual reproduction by binary fission.

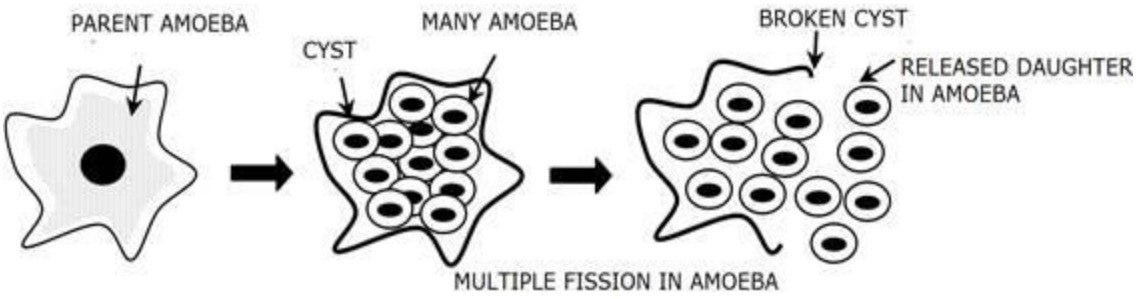


BINARY FISSION IN AMOEBA

2. Multiple Fission

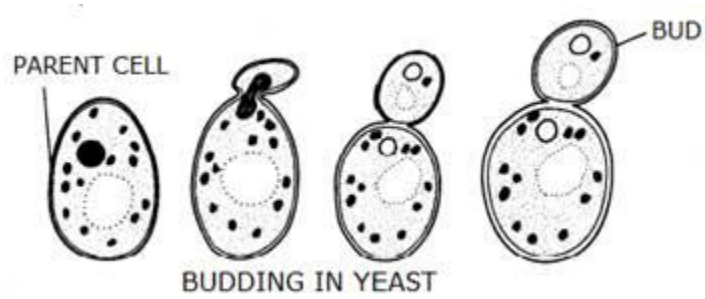
Multiple fission usually found in Amoeba and other similar

Protista. Amoeba stops the formation of pseudopodia and thereby movements whenever there is lack of food or any other type of adverse condition. It becomes rounded and forms a protective covering around plasma membrane. Such encysted Amoeba or any other protistis called as ‘Cyst’. Many nuclei are formed by repeated nuclear divisions in the cyst. It is followed by cytoplasmic division and thus, many amoebulae are formed. They remain encysted till there are adverse conditions. Cyst breaks open on arrival of favorable conditions and many amoebulae are released.



3. Budding:

In budding a small bud comes out of many parent cells. It occurs by budding in yeast- a unicellular fungus. A small bulge appears on the surface of parent cell. This bulge is actually a bud. One of the two daughter nuclei enters this bud. After sufficient growth, bud separates from the parent cell and starts to live independently as a daughter yeast cell. Yeast cell produces two daughter nuclei by mitotic division by budding. This yeast cell is called as parent cell.



Q. 4. B. Answer the following questions in short.

Explain the concept of IVF.

Answer : IVF stands for in vitro fertilization; technique fertilization is brought about in the test-tube and the embryo formed is implanted in uterus of woman at appropriate time.

IVF technique is used for having the child in case of those childless couples who have problems like less sperm count, obstacles in oviduct, etc.

For women having problems in implantation of embryo in uterus. Such women can take the help of the modern remedial technique called as surrogacy. In this technique, oocyte is collected from the ovary of the woman having problem in implantation in uterus. That oocyte is fertilized in test-tube with the help of sperms collected from her husband. The embryo formed from such fertilization is implanted in the uterus of some other woman having normal uterus. Such a woman, uterus the embryo is implanted, is called as surrogate mother.

Q. 4. C. Answer the following questions in short.

Which precautions will you follow to maintain the reproductive health?

Answer : Private organs (genitals) need to be maintained clean time to time, problems regarding reproductive health may arise occurrence of menstrual cycle is related with reproductive and overall health of women.

Women are working equivalent to men. Due to this, they have to stay outdoors for whole day. Bleeding occurs during menstrual cycle. Due to this, private organs (genitals) need to be maintained clean time to time, otherwise, problems regarding reproductive health may arise.

Q. 4. D. Answer the following questions in short.

What is menstrual cycle? Describe it in brief.

Answer : 1)Female reproductive system undergoes some changes at puberty and those changes repeat at the interval of every 28 – 30 days. These repetitive changes are called as menstrual cycle.

2) Menstrual cycle is a natural process, controlled by four hormones. These four hormones are follicle stimulating hormone (FSH), luteinizing hormone (LH), estrogen and progesterone.

3) One of the several follicles in the ovary starts to develop along with the oocyte present in it, under the effect of follicle stimulating hormone. This developing follicle secretes estrogen.

4) Endometrium of the uterus starts to develop (during first cycle) or regenerate (during subsequent cycles) under the effect of estrogen. Developing follicle completes its development. It bursts under the effect of luteinizing hormone and oocyte is released. This is called as ovulation.

5) Remaining tissue of the burst follicle forms the corpus luteum.

Corpus luteum starts to secrete progesterone. Endometrial glands

Secrete their secretion under the effect of progesterone.

Such endometrium is ready for implantation of embryo.

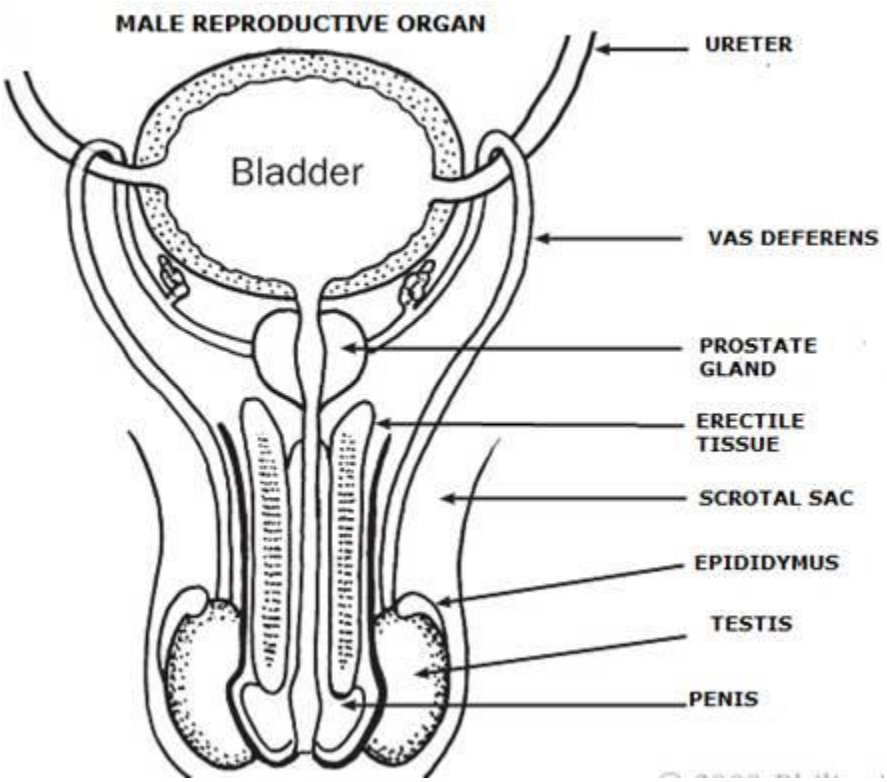
Q. 5. In case of sexual reproduction, newborn show similarities about characters. Explain this statement with suitable examples.

Answer : The chromosome numbers in germ cells producing the gametes are diploid. It includes 22 pairs of autosomes which are similar in all gametes and 1 pair of sex-chromosomes (44 + XX or 44 + XY). These results in similarities in characters in new born.

Q. 6. A. Sketch the labeled diagrams.

Human male reproductive system.

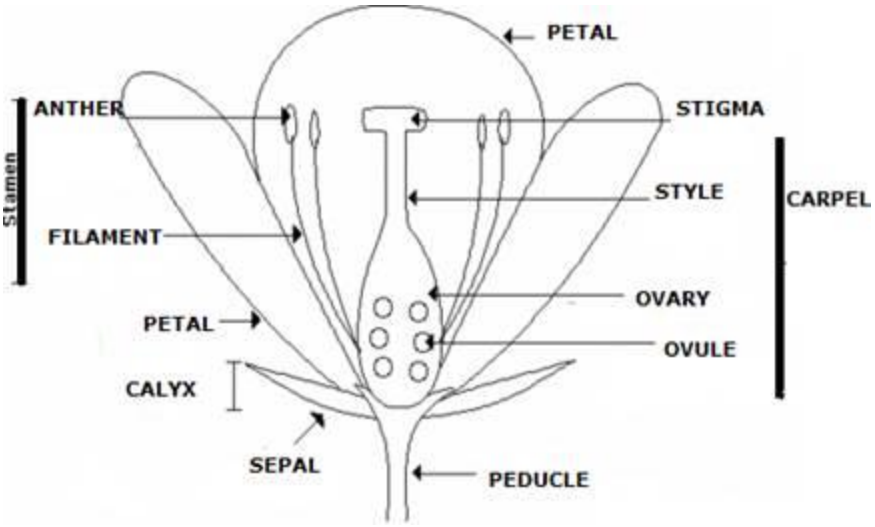
Answer :



Q. 6. C. Sketch the labeled diagrams.

Flower with its sexual reproductive organs.

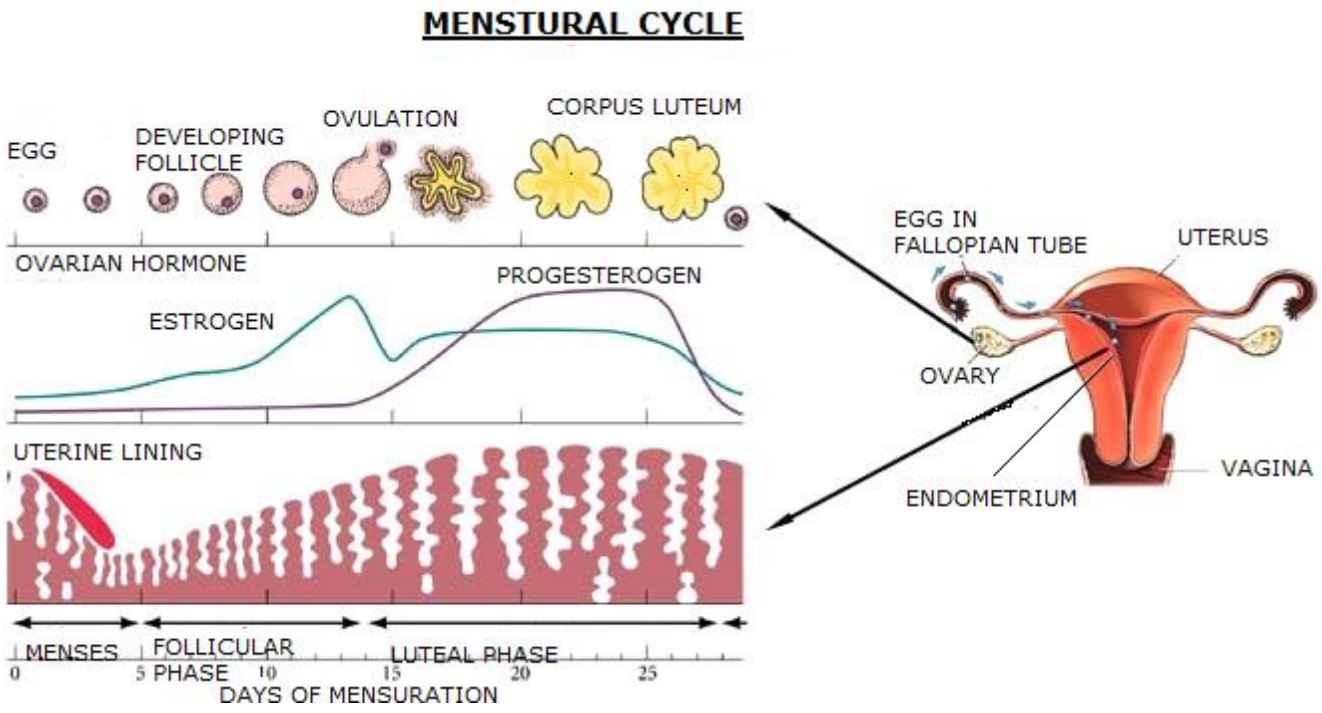
Answer :



Q. 6. D. Sketch the labeled diagrams.

Menstrual cycle.

Answer :



Q. 7. Give the names.

a. Hormones related with male reproductive system.
b. Hormones secreted by ovary of female reproductive system.
c. Types of twins.

d. Any two sexual diseases.
e. Methods of family planning.

Answer : a. Follicle- Stimulating Hormone, Luteinizing Hormone, Testosterone, Inhibin.

b. estrogen and progesterone.

c. There are two main types of twins as- monozygotic twins and dizygotic twins.

d. syphilis and gonorrhea.

e. Few methods involved in family planning are the implant or intra uterine device (IUD), hormonal contraception, such the pill, barrier methods, such as condoms

Emergency contraception fertility awareness permanent contraception, such as vasectomy and tubal ligation.

The intra uterine devices (IUD) are that lasts for five to ten years.

These are contraceptives that use hormones to prevent pregnancy.

Hormonal contraceptives include the pill.

There are two types of the pill: the combined oral contraceptive pill and

Progestogen – only contraceptive pill.

Barrier methods stop sperm from entering the vagina. The two barrier methods are:

Condoms and internal condoms

There are two options for emergency contraception: the emergency contraceptive pill (ECP) or a copper IUD.

Q. 8. Gender of a child is determined by the male partner of the couple. Explain with reasons whether this statement is true or false.

Answer : The man is responsible, whether the couple will have a boy or a girl child. During zygote formation, man contributes either X or Y chromosome to the next generation but females transfer only X-sex chromosome to the next generation. At the time of fertilization, if X-chromosomes comes from the male, the child will be a girl and if Y-chromosome comes then the child will be a boy.

Q. 9. Explain asexual reproduction in plants.

Answer : Reproduction in plants with the help of vegetative parts like root, stem, leaf, and bud are called as asexual or vegetative reproduction. Vegetative propagation by potatoes preforms with the help of 'eyes' present on tube, in Bryophyllum it is performed with the help of buds present on leaf margin, in sugarcane & grasses vegetative propagation occurs with the help of buds present on nodes. Plants like carrot and radish perform vegetative propagation with the help of roots.

Q. 10. Modern techniques like a surrogate mother, sperm bank, and IVF technique will help the human beings. Justify this statement.

Answer : Modern techniques like surrogacy, sperm bank, IVF technique help the human beings to have their children.

Techniques are used for having the child in case of those childless couples who suffer problems like less sperm count, obstacles in oviduct, etc.

In Vitro Fertilization (IVF)

In this process fertilization is brought about in the test-tube and the embryo formed is implanted in uterus of woman at appropriate time.

Surrogacy

Some women have problems in implantation of embryo in uterus.

Such women can take the help of the modern remedial technique called as surrogacy.

In this technique, oocyte is collected from the ovary of the woman having problem in implantation in uterus.

This oocyte is fertilized in test-tube with the help of sperms collected from her husband. The embryo formed from such fertilization is implanted in the uterus of some other woman having normal uterus.

Such a woman, in whose uterus the embryo is implanted, is called as surrogate mother.

Sperm Bank/ Semen Bank

So as to have the children in case of such couples, new concept of sperm bank has been introduced. This concept is similar to blood bank. Semen ejaculated by the desired men is collected after their thorough physical and medical check-up and stored in the sperm bank.

Q. 11. Explain sexual reproduction in plants.

Answer : 1. Sexual reproduction in plants involves pollination and fertilization. Pollen grains from anther are transferred to the stigma. This is called as pollination.

2. Pollination requires abiotic agents (wind, water) and biotic agents (insects and other animals). Stigma becomes sticky during pollination. Pollens germinate when they fall upon such sticky stigma i.e. a long pollen tube and two male gametes are formed.

3. The pollen tube carries male gametes. Pollen tube reaches the embryo sac via style. Tip of the pollen tube bursts and two male gametes are released in the embryo sac. One male gamete fuses with the egg cell to form a zygote. This is fertilization. Second male gamete unites with two polar nuclei and endosperm is formed. As two nuclei participate in this process, it is called as double fertilization.