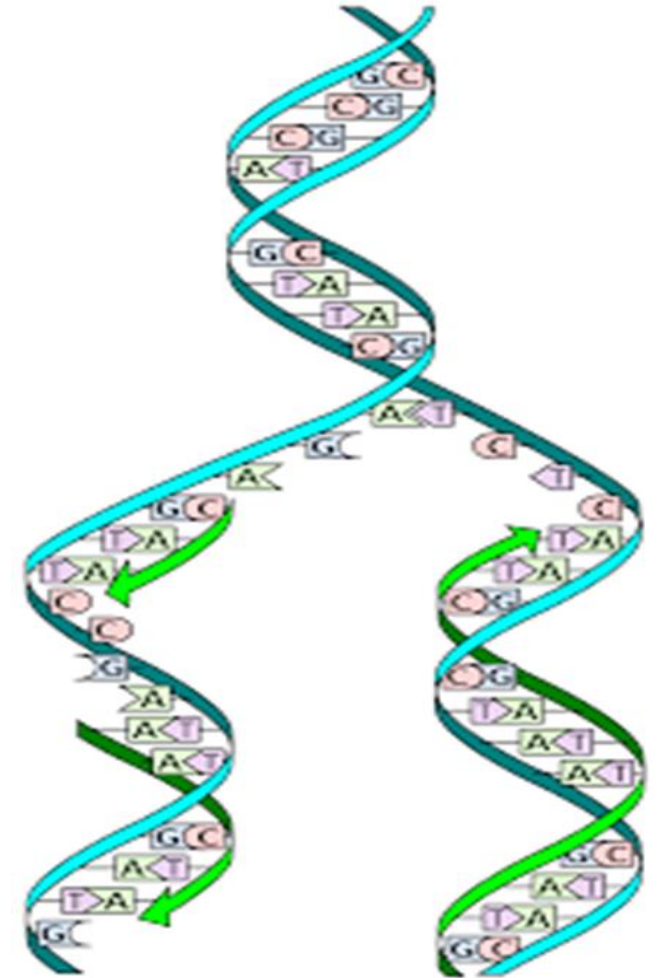


HOW DO ORGANISMS REPRODUCE

CLASS – 10

SUBJECT - BIOLOGY

The diagram illustrates the process of DNA replication. At the top left, a blue X-shaped structure is labeled "Chromosome". Below it, a double helix is labeled "Original (template) DNA". The replication fork is shown as the double helix unwinds. On the left, the "Leading strand" is synthesized continuously towards the fork. On the right, the "Lagging strand" is synthesized discontinuously away from the fork as Okazaki fragments. "Free nucleotides" (green, orange, red, and blue) are shown entering the fork. "DNA polymerase" (yellow) is shown synthesizing the new strands. "Helicase" (blue) is shown unwinding the original DNA. A legend at the bottom identifies the bases: Adenine (red), Thymine (orange), Cytosine (green), and Guanine (blue).

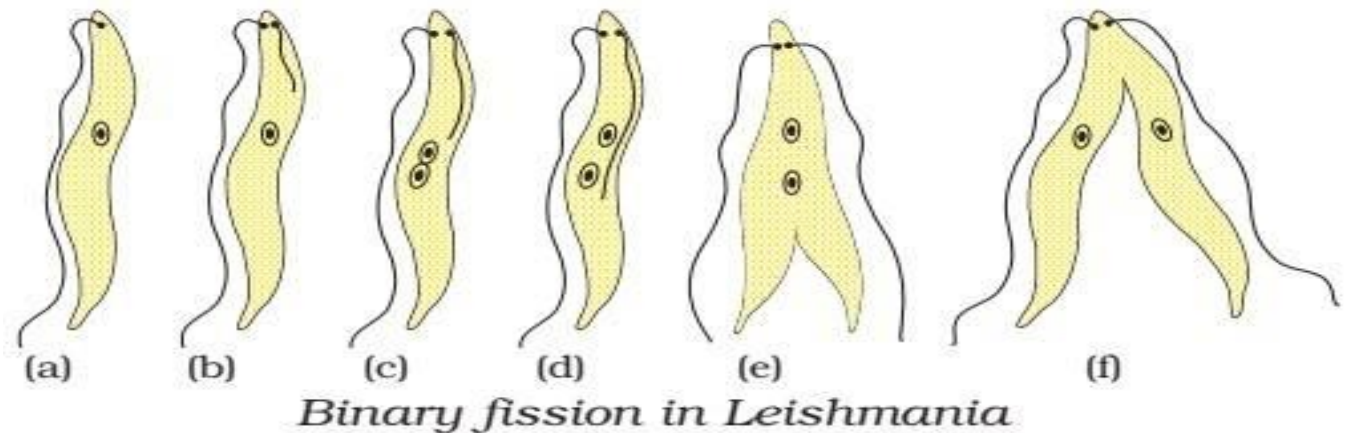
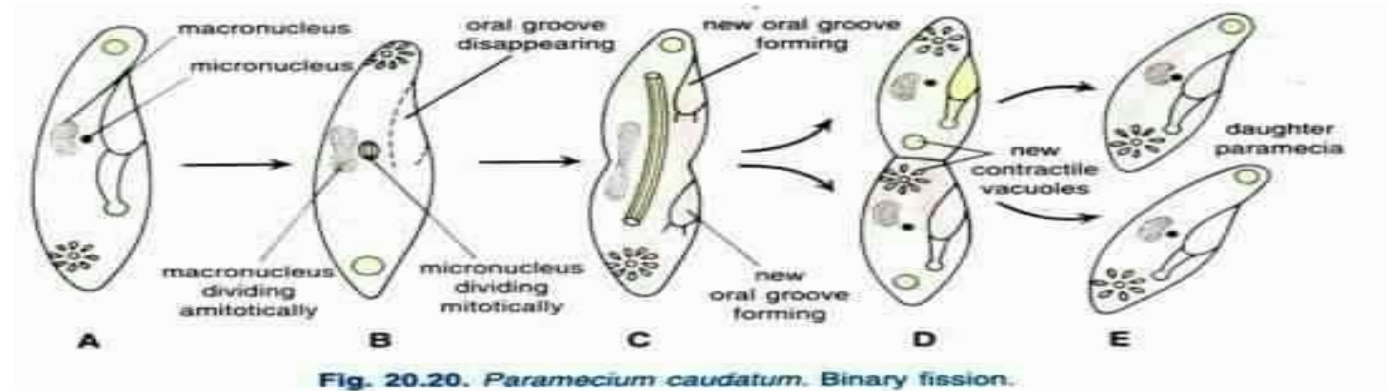
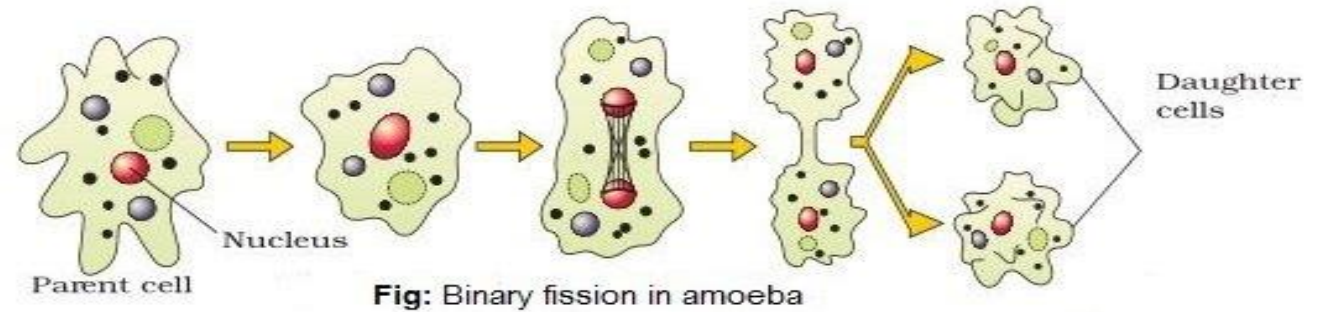


TYPES OF BINARY FISSION

1. IRREGULAR BINARY FISSION

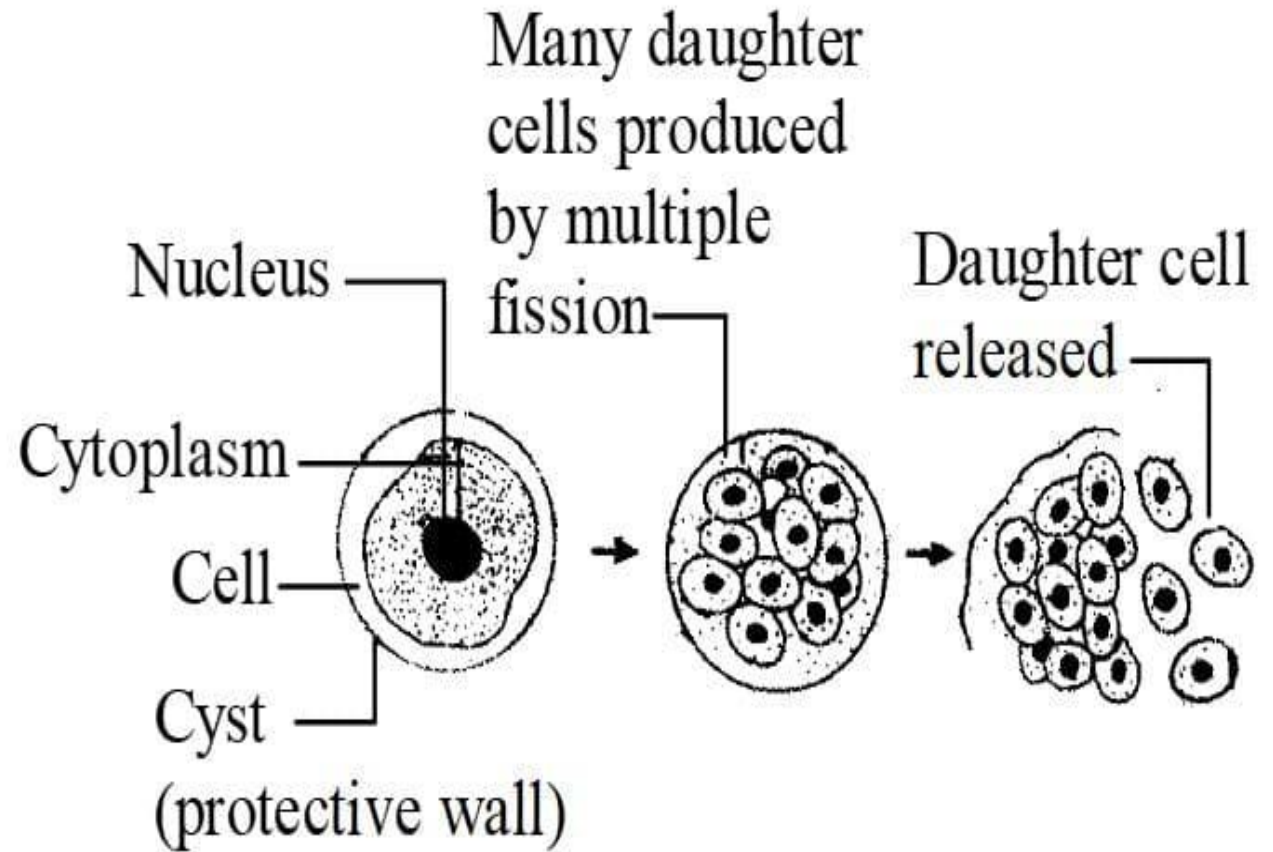
2. TRANSVERSE BINARY FISSION

3. LONGITUDINAL BINARY FISSION



Multiple fission

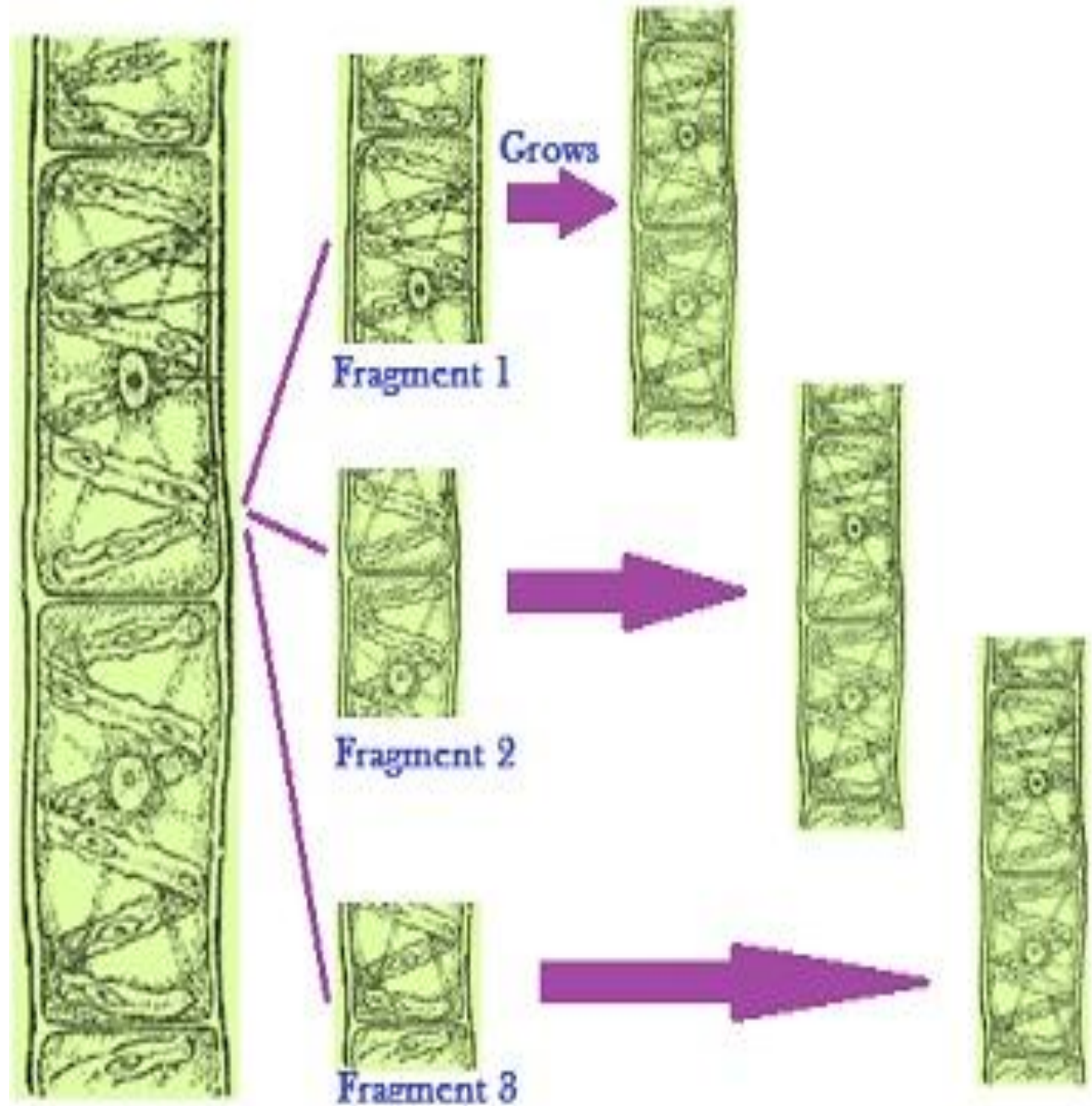
MULTIPLE FISSION IN PLASMODIUM



FRAGMENTATION

FRAGMENTATION IN SPIROGYRA

EACH FRAGMENT
DEVELOPES INTO A
NEW INDIVIDUAL



Vegetative
propagation

By leaf:

Bryophyllum sp.

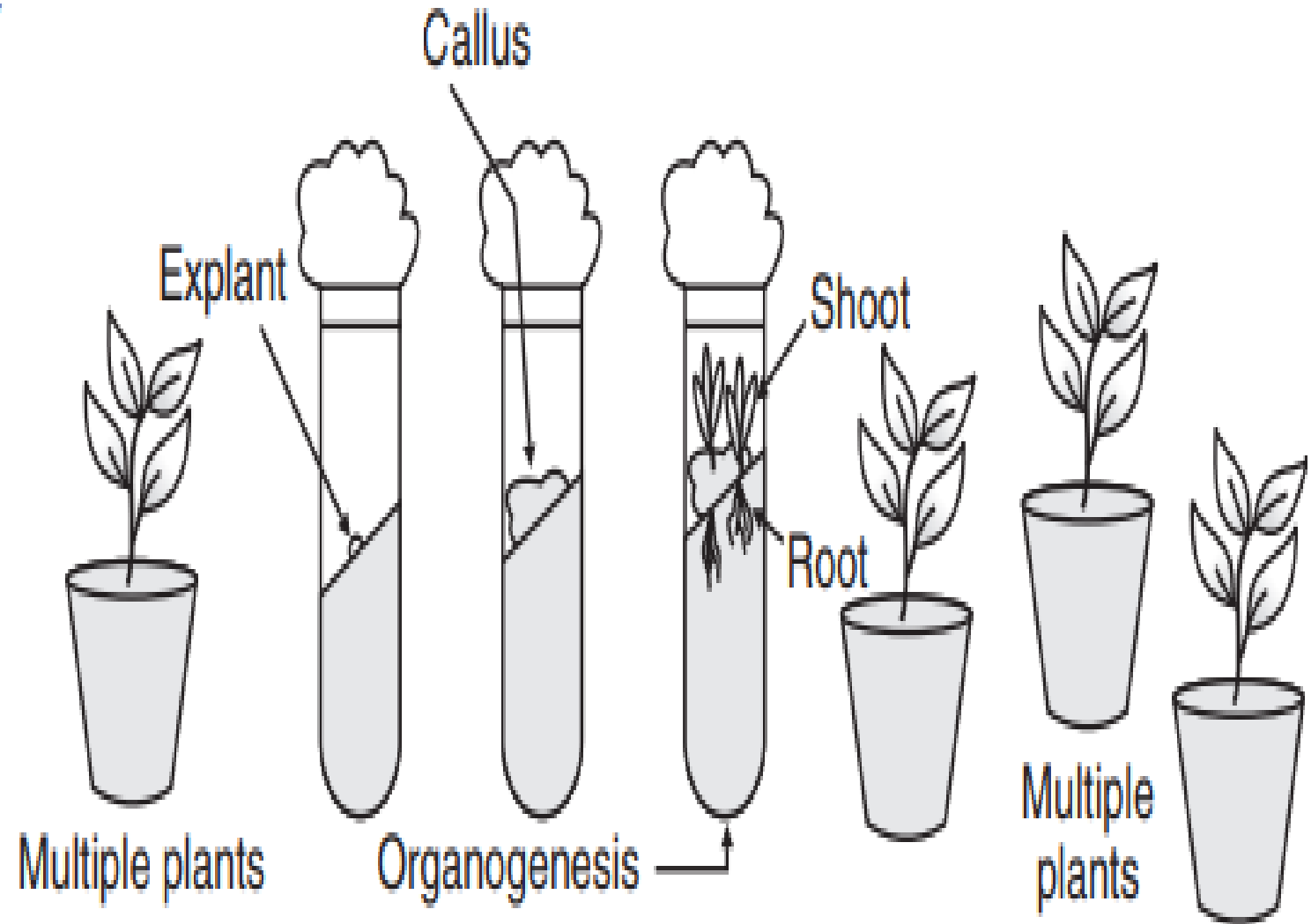


Tissue culture technique

1. In tissue culture, new plants are grown by removing tissue or separating cells from the growing tip of a plant.
2. The cells are then placed in an artificial medium where they divide rapidly to form a small group of cells or callus.
3. The callus is transferred to another medium containing hormones for growth and differentiation.
4. The plantlets are then placed in the soil so that they can grow into mature plants.

Using tissue culture, many plants can be grown from one parent in disease-free conditions.

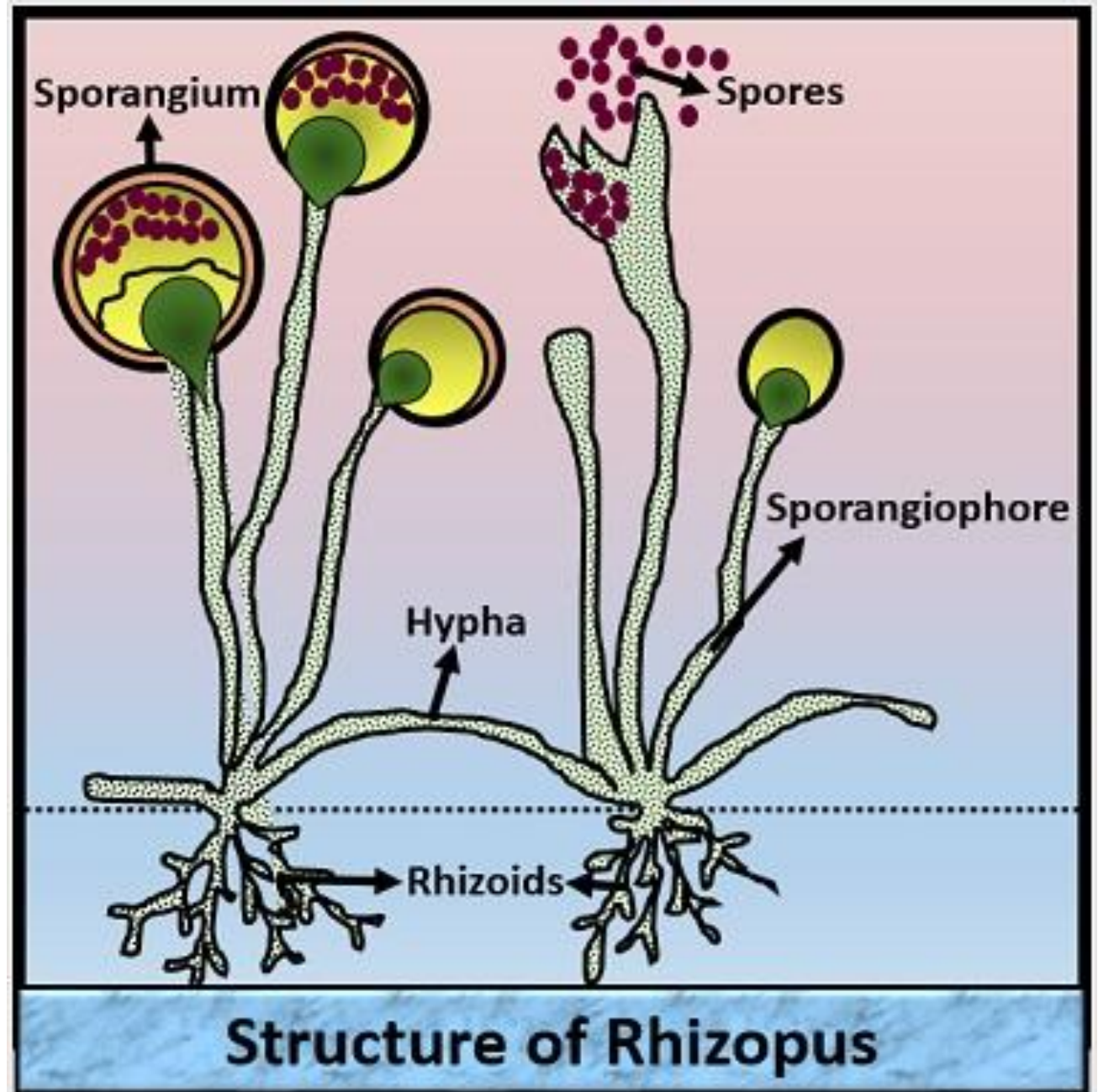
This technique is commonly used for ornamental plants.



Steps in plant tissue culture (callus culture)

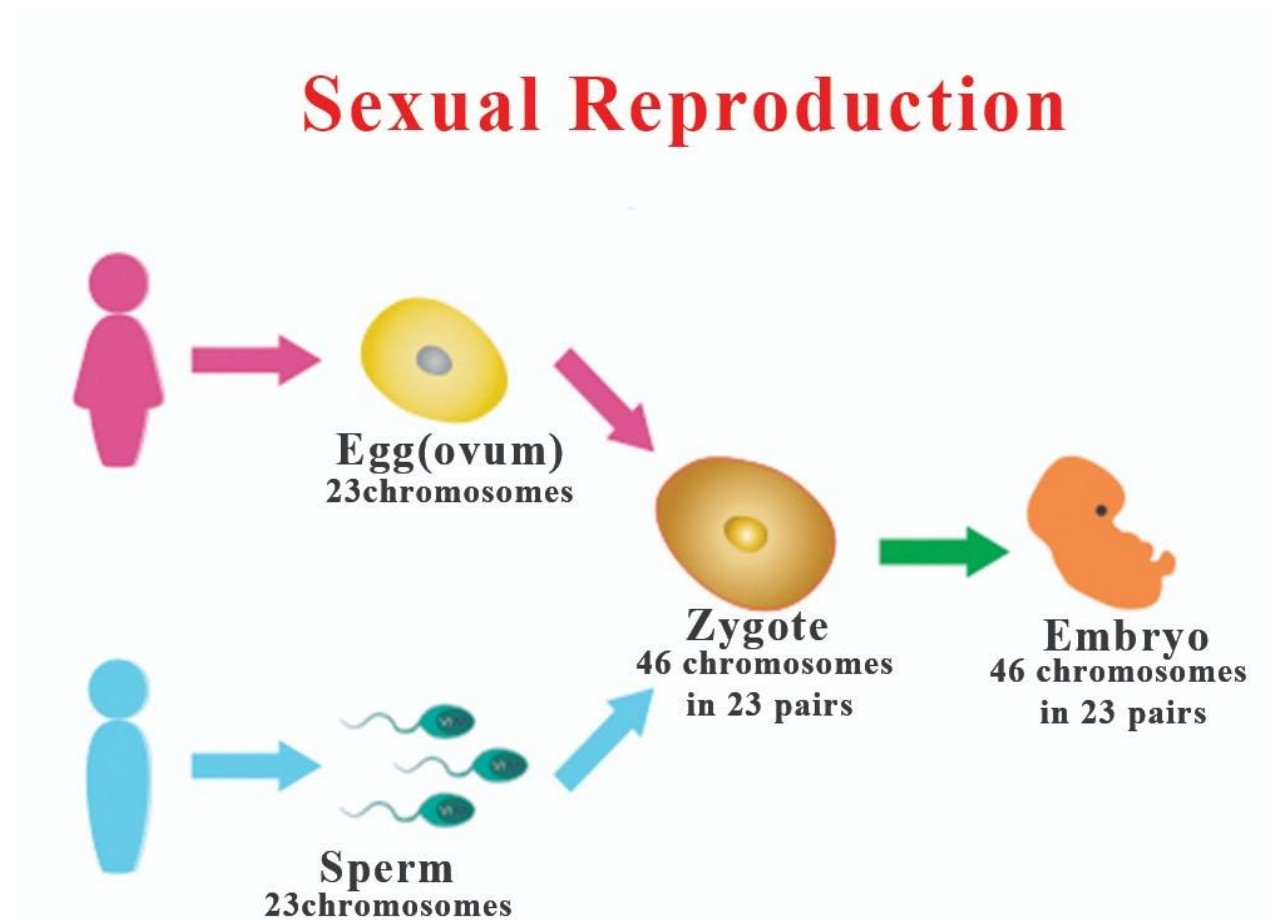
Spore formation in Rhizopus

1. Hypha
2. Sporangiophore
3. Sporangium
4. Spores

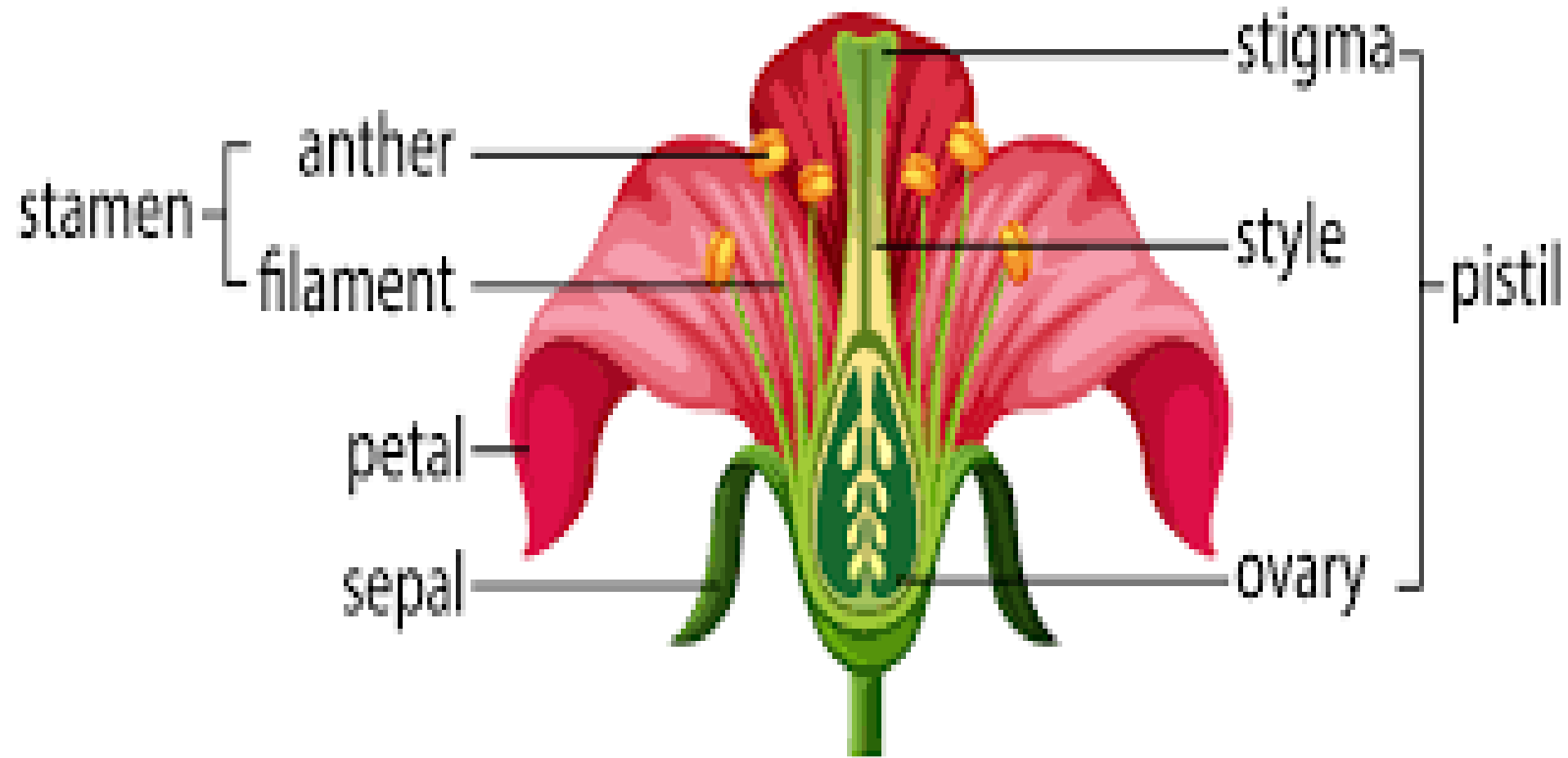


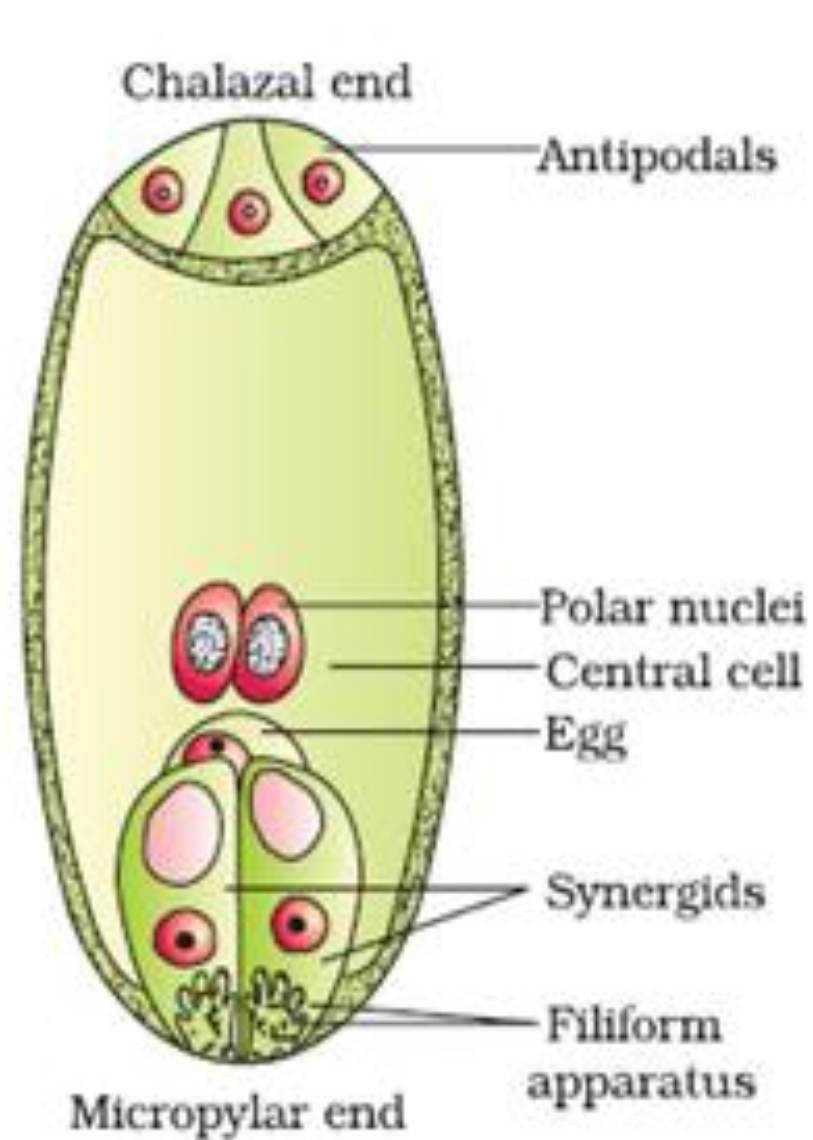
CHROMOSOME
NUMBER DURING
SEXUAL REPRODUCTION

NUMBER OF
CHROMOSOMES WILL BE
CONSTANT DURING
SEXUAL MODE OF
REPRODUCTION AND IT
WILL BE MAINTAINED BY
THE PROCESS OF MEIOSIS
CELL DIVISION.

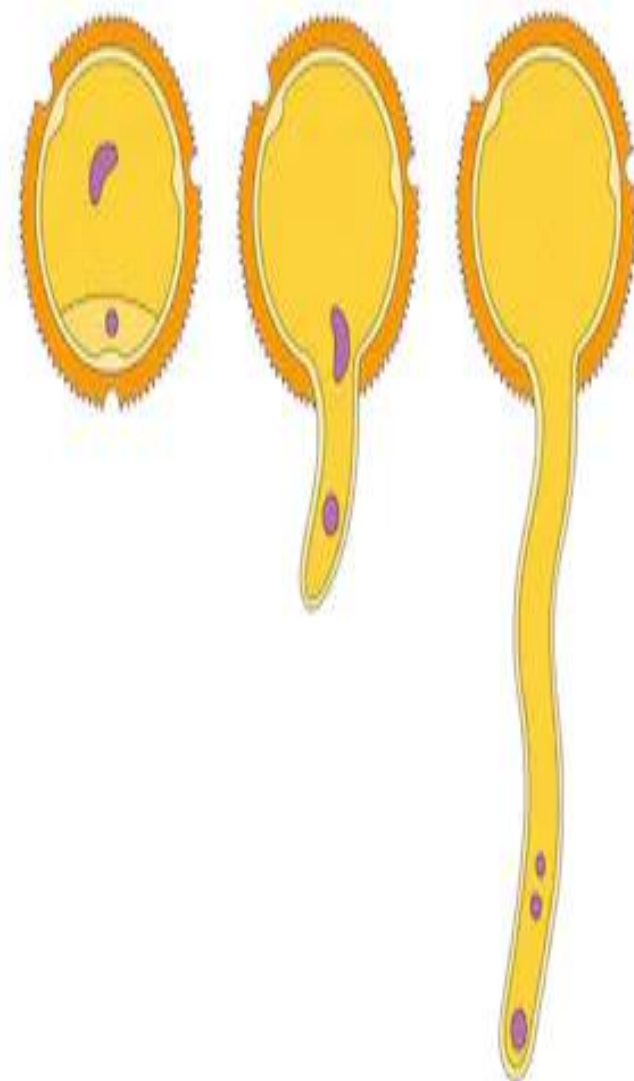
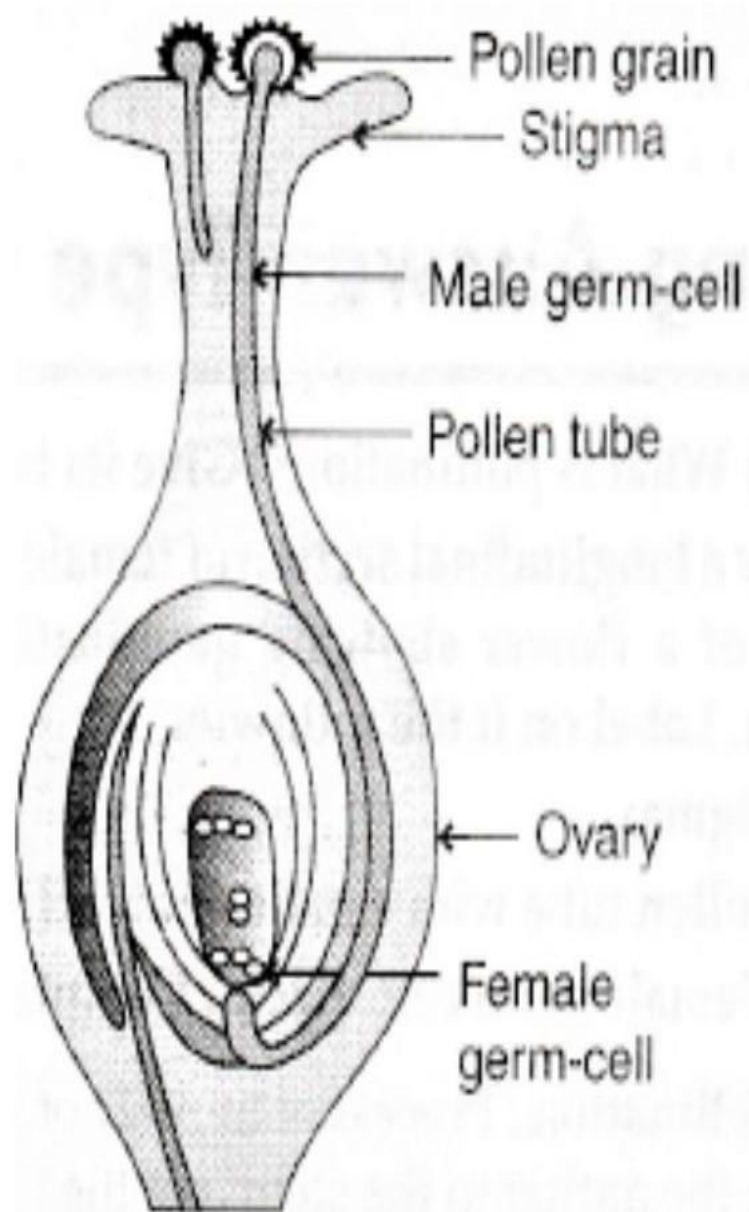


Common Flower Parts

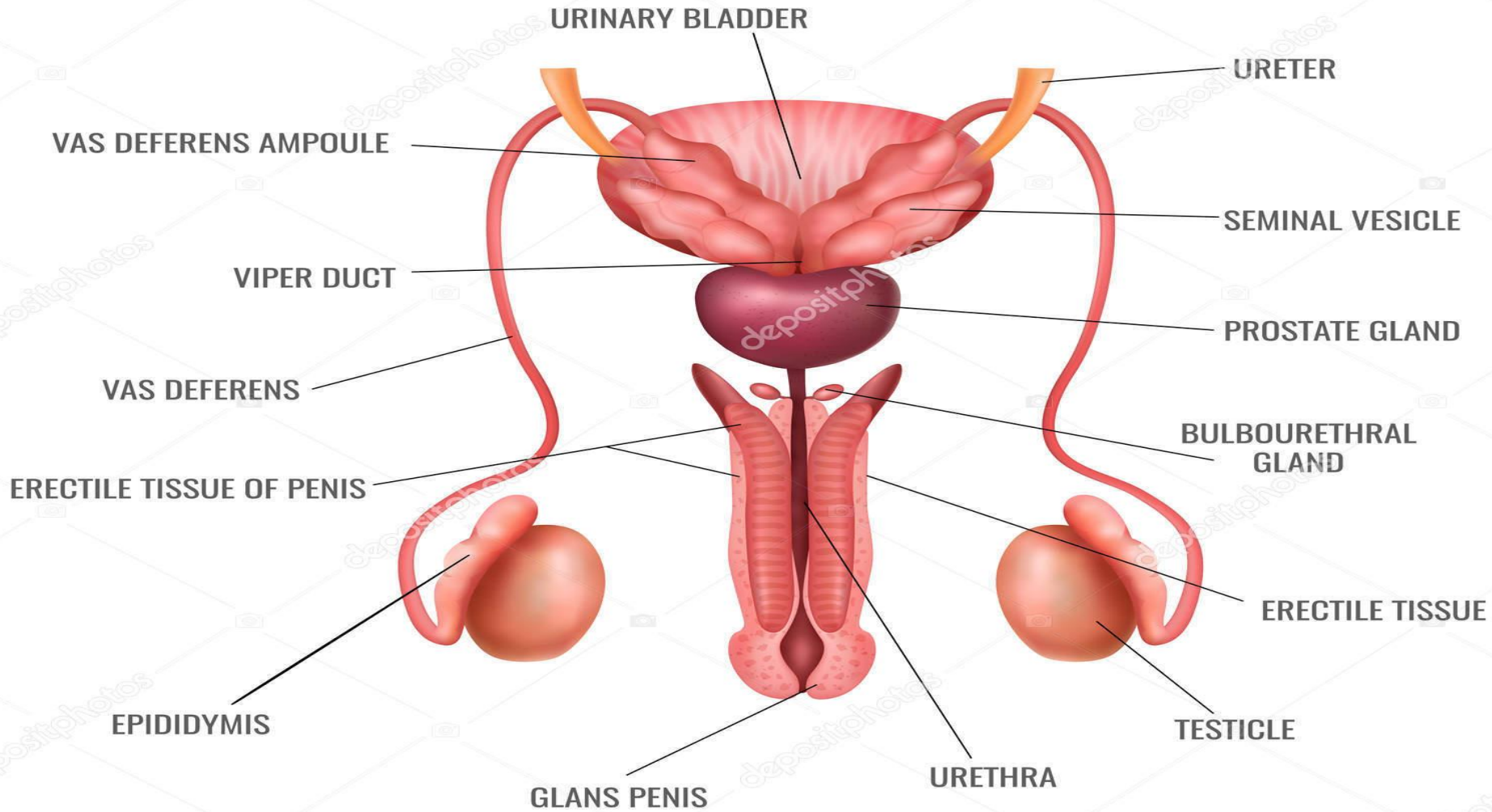


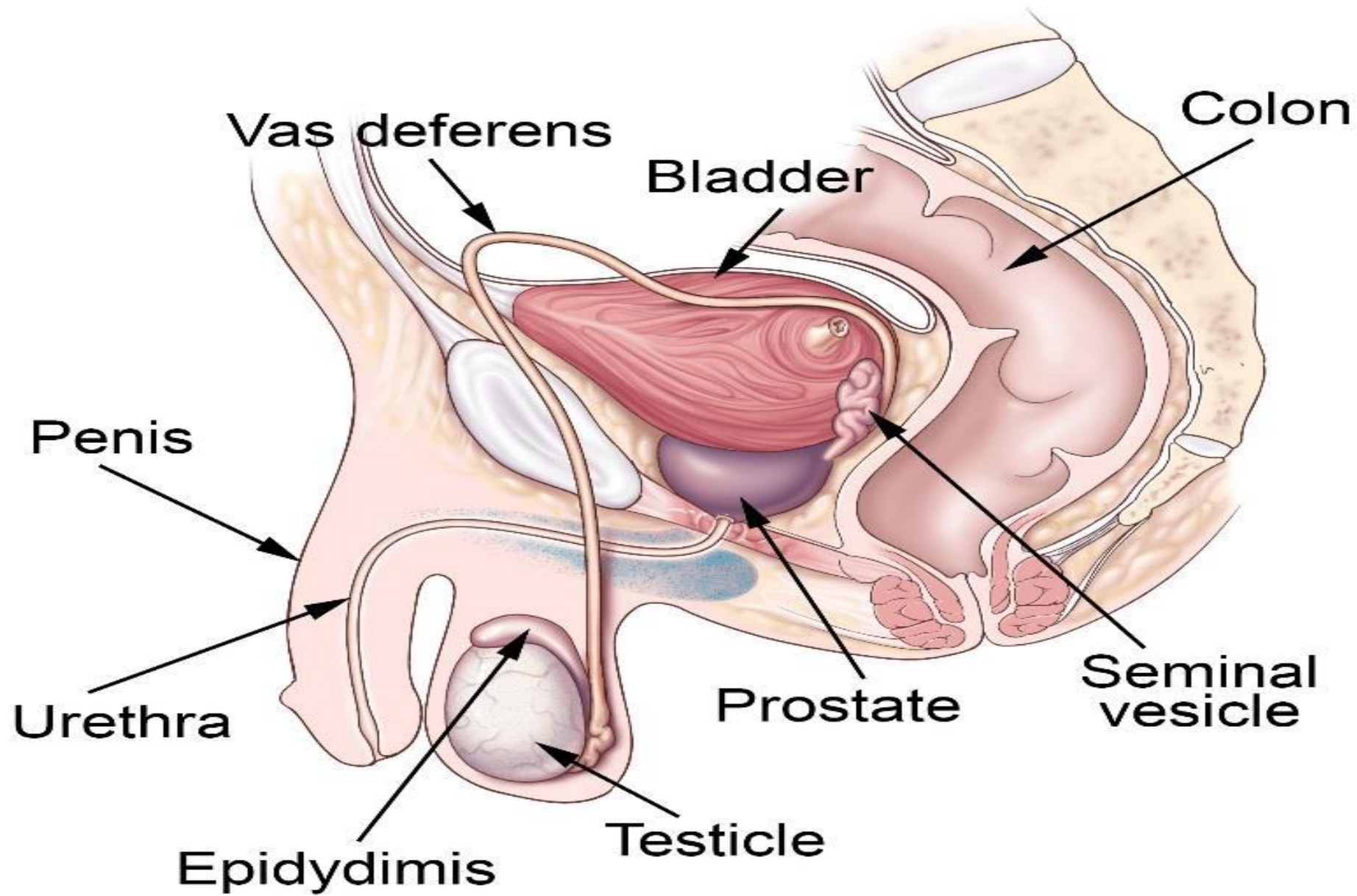


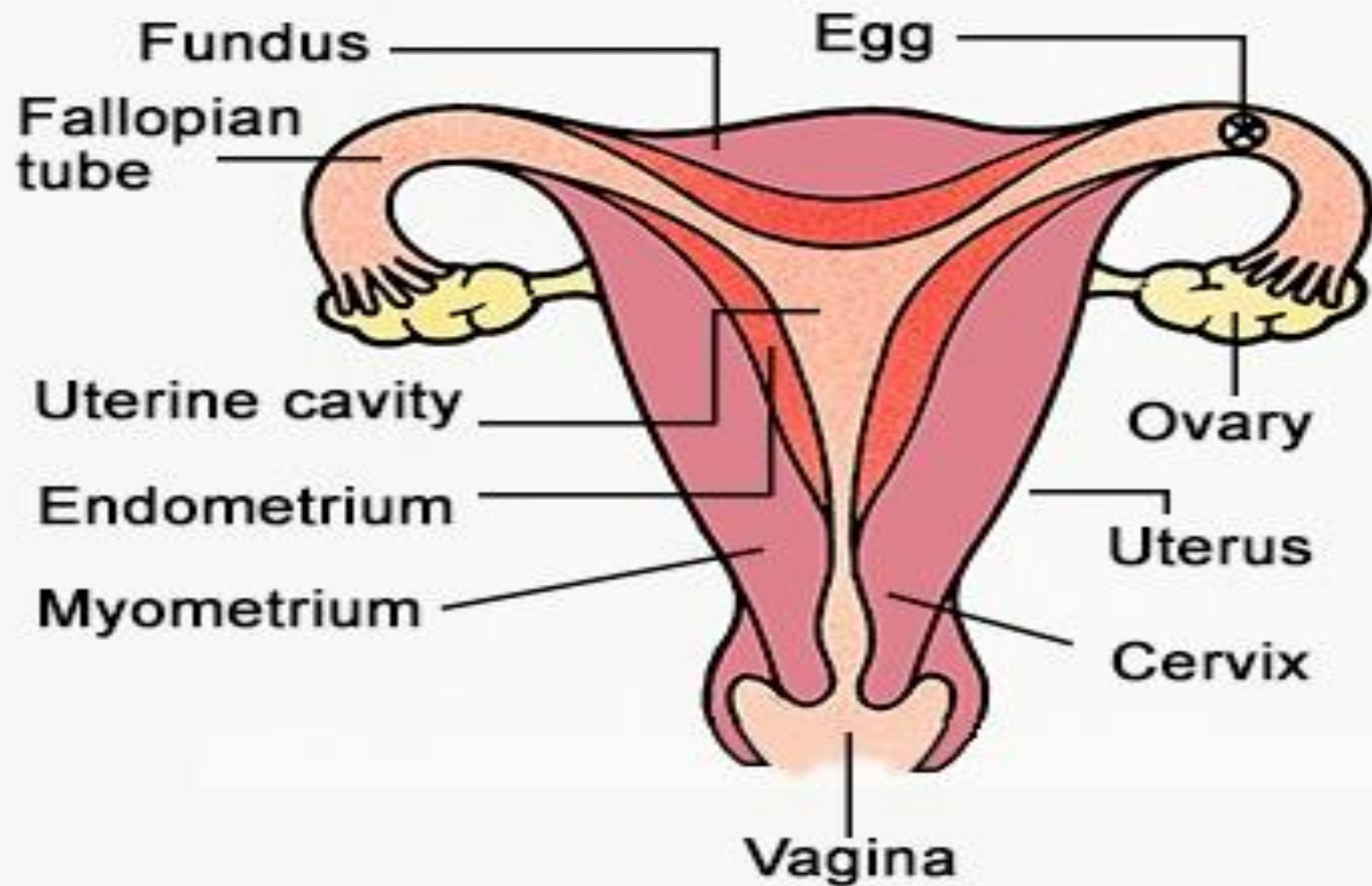
A mature embryo sac

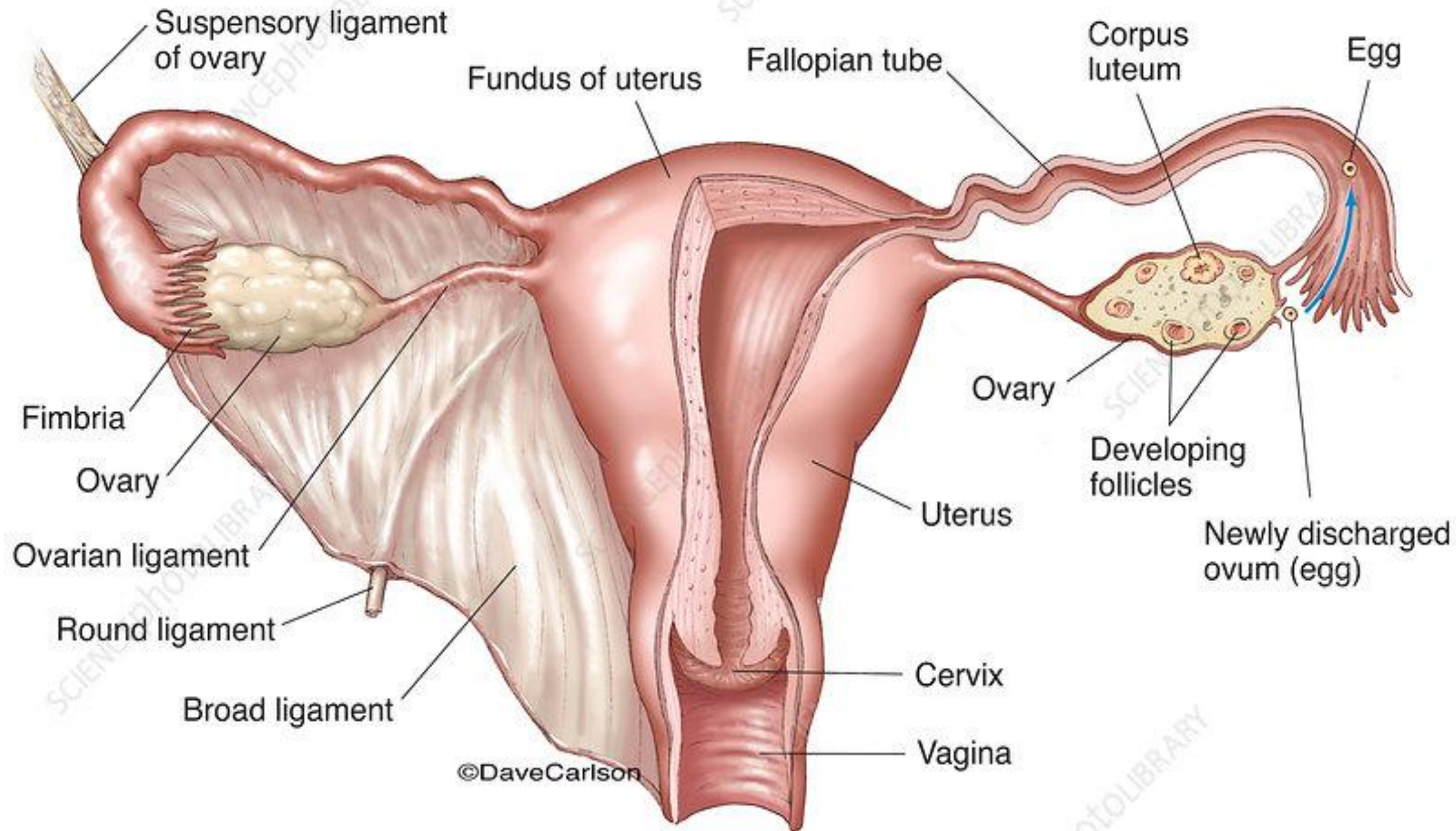


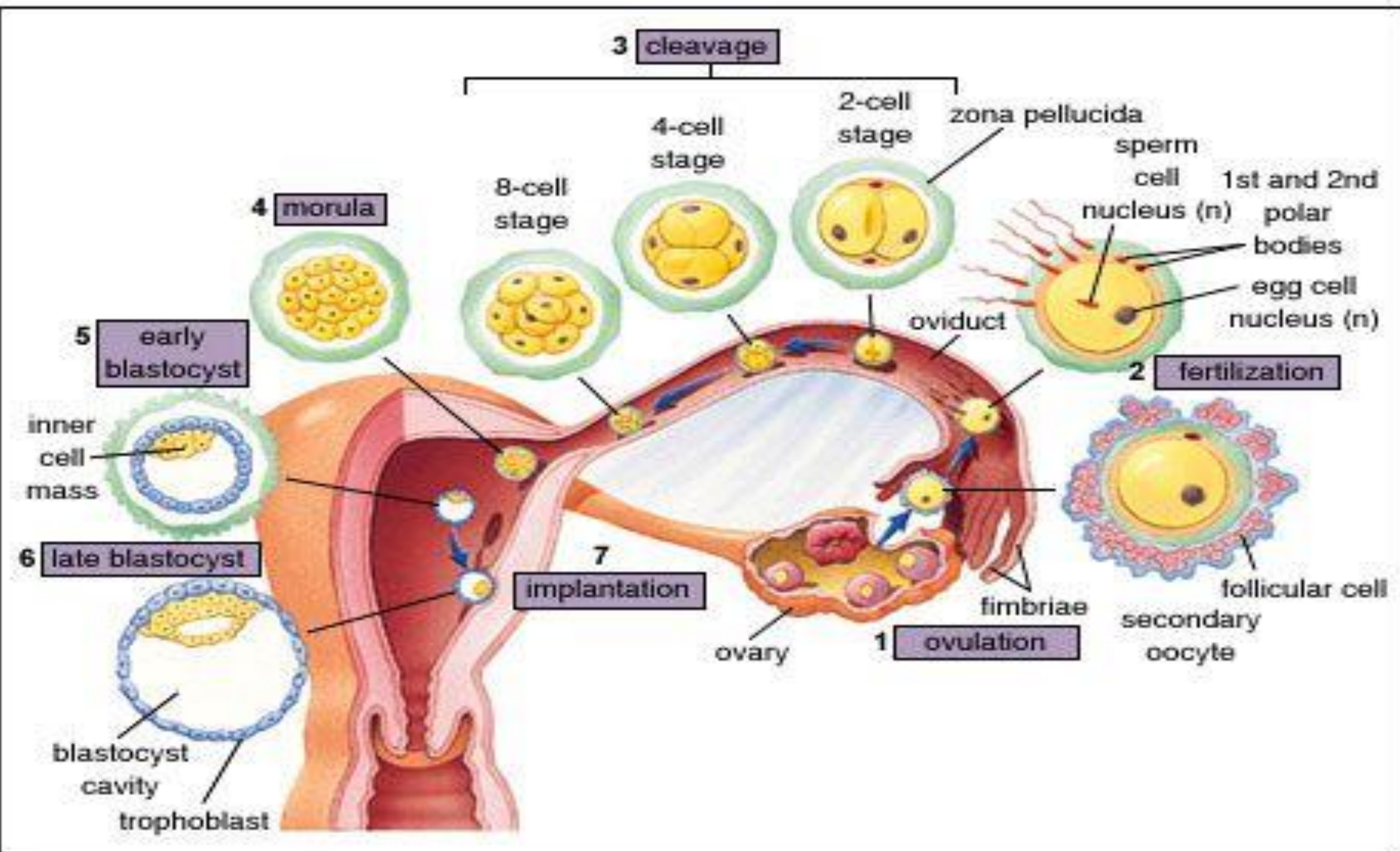
MALE REPRODUCTIVE SYSTEM











Uterus

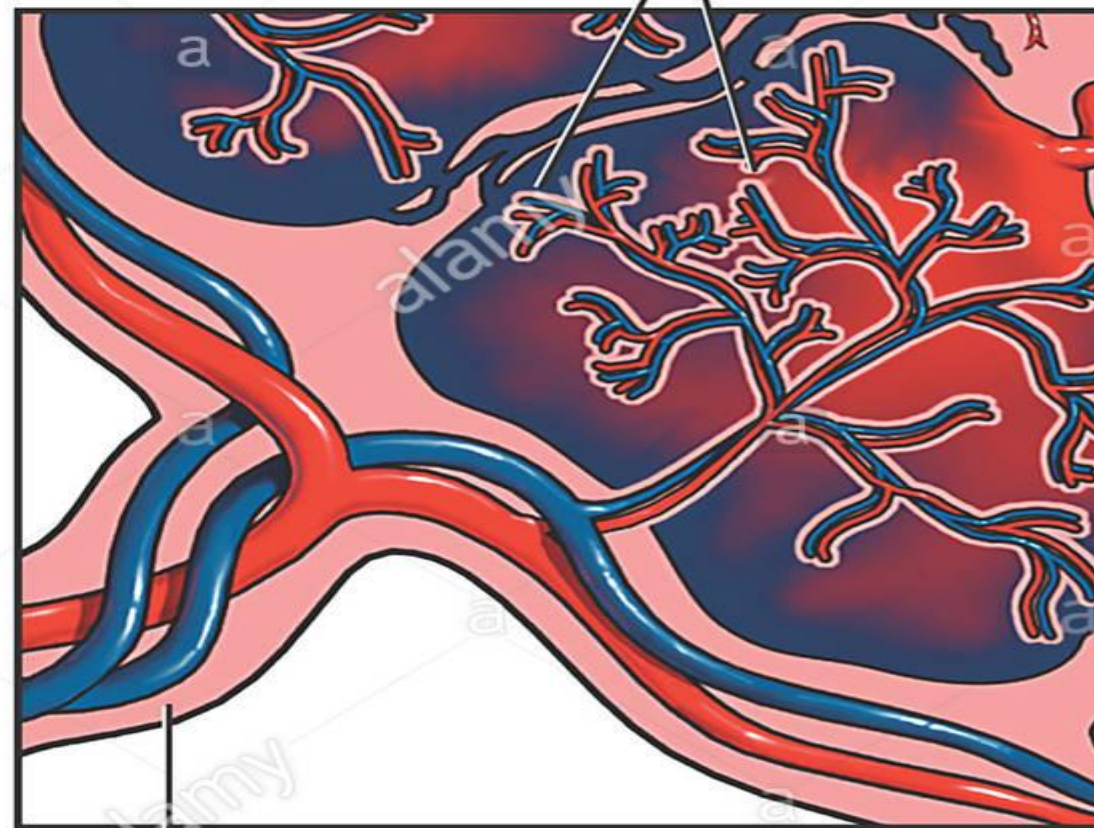
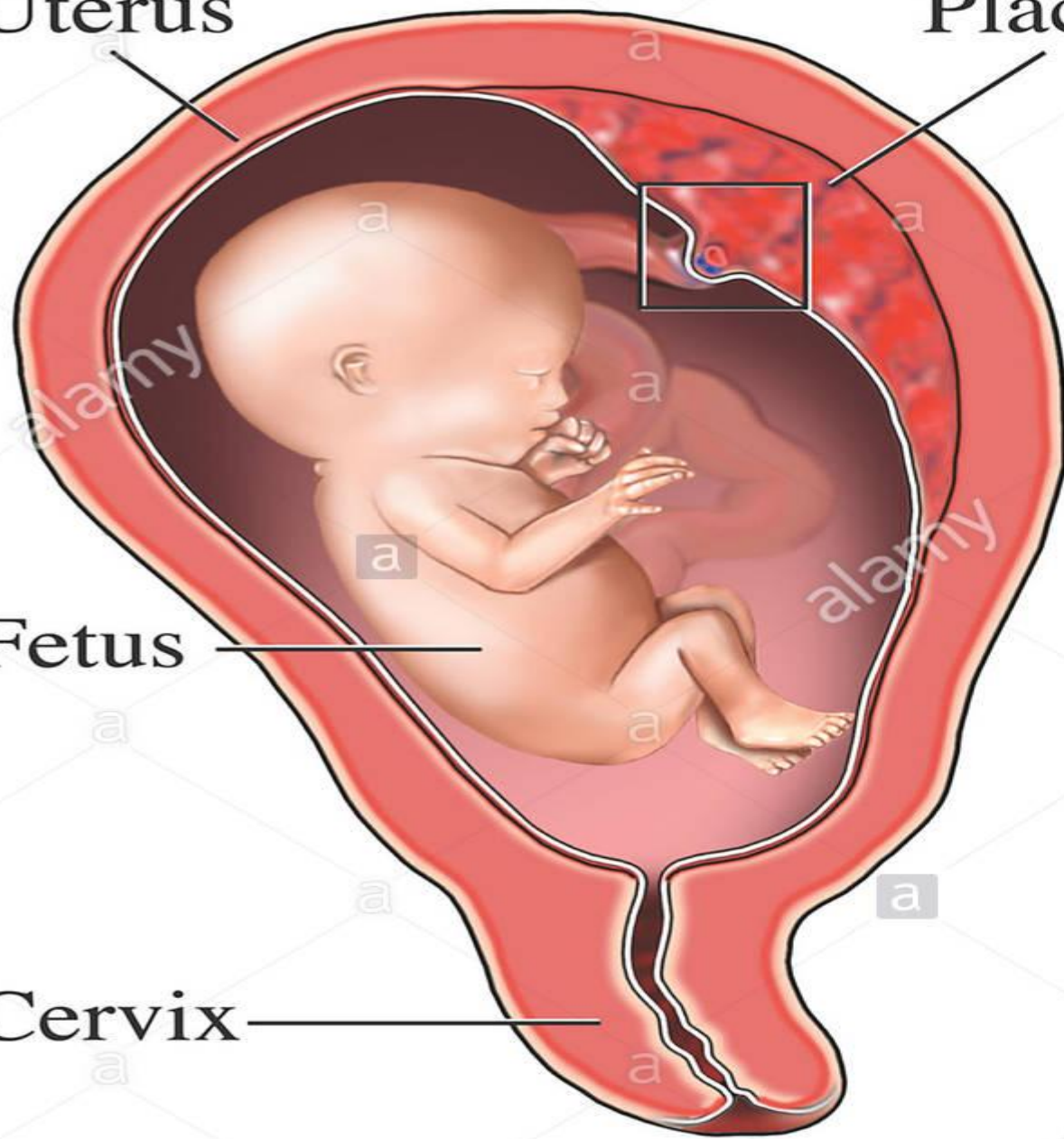
Placenta

Chorionic villi

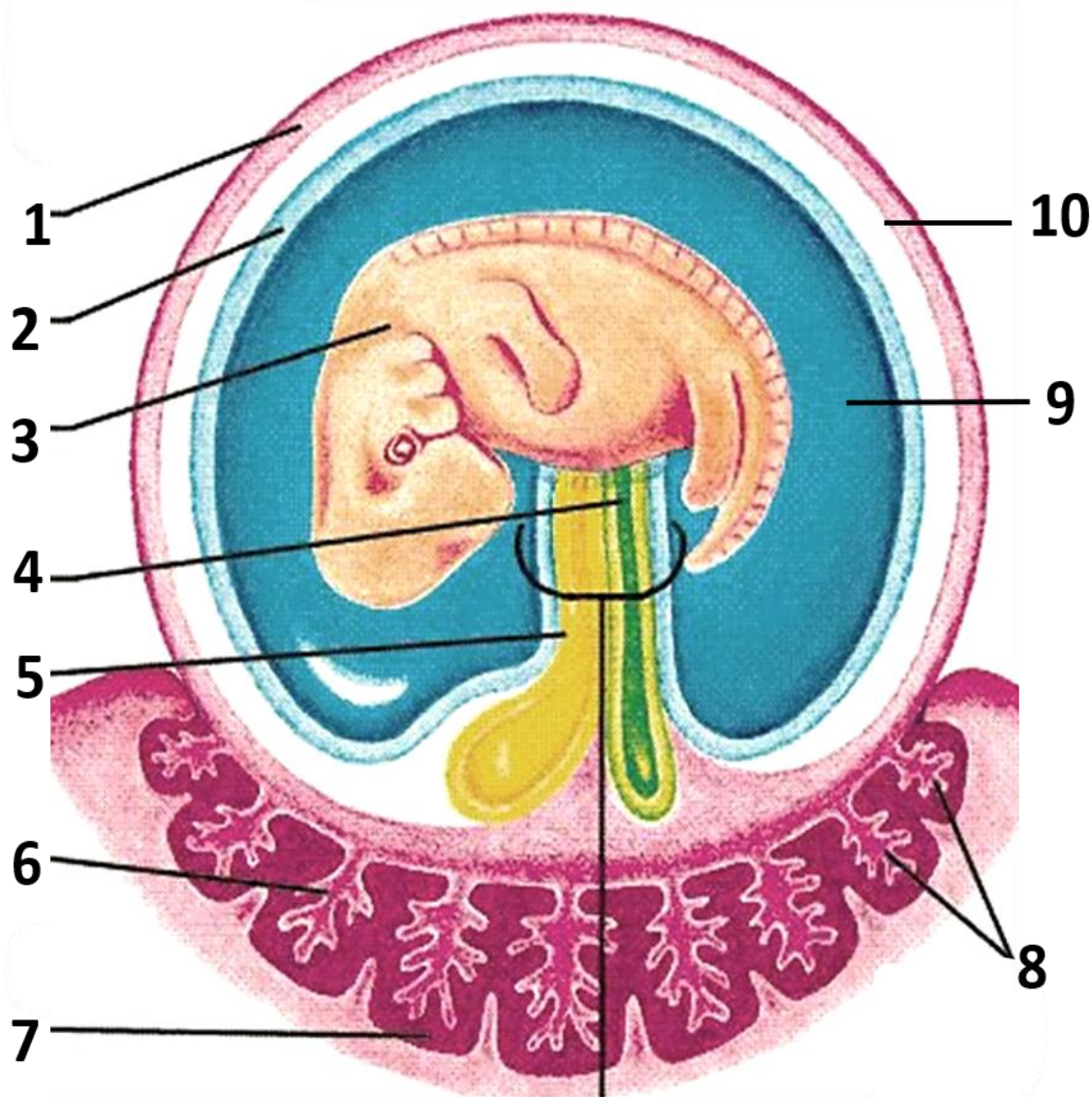
Fetus

Cervix

Umbilical cord

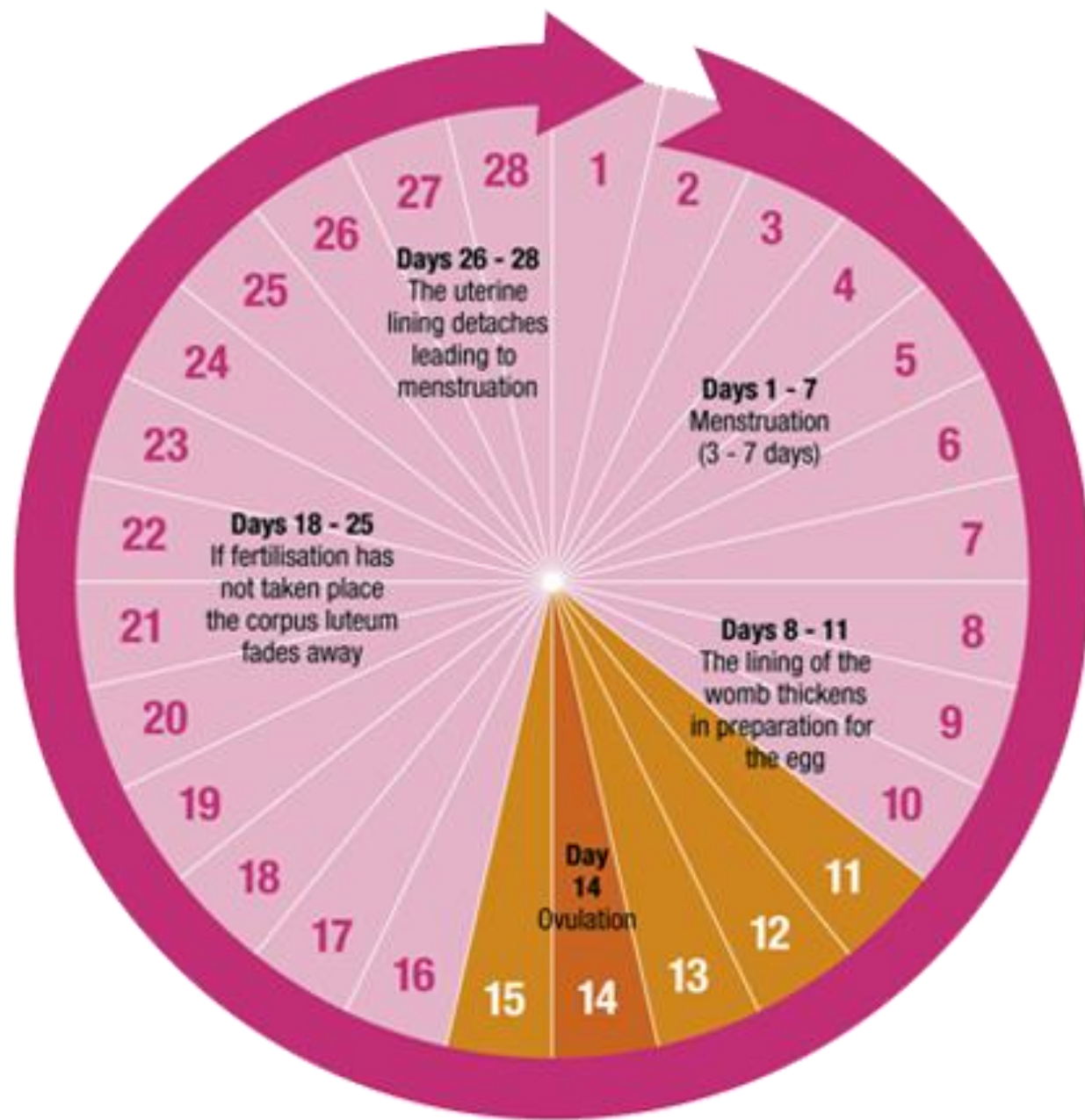
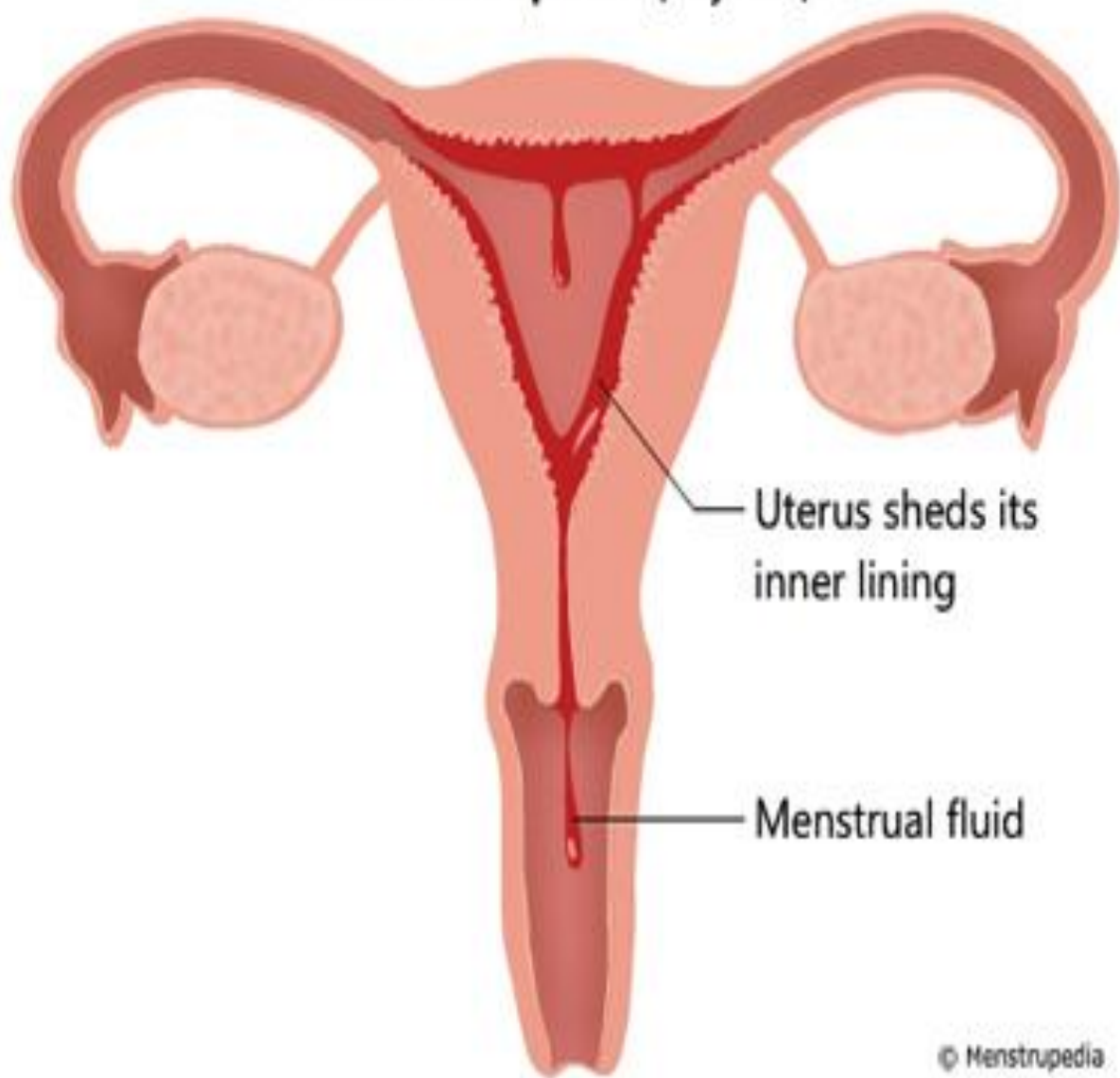


Extraembryonic Membranes



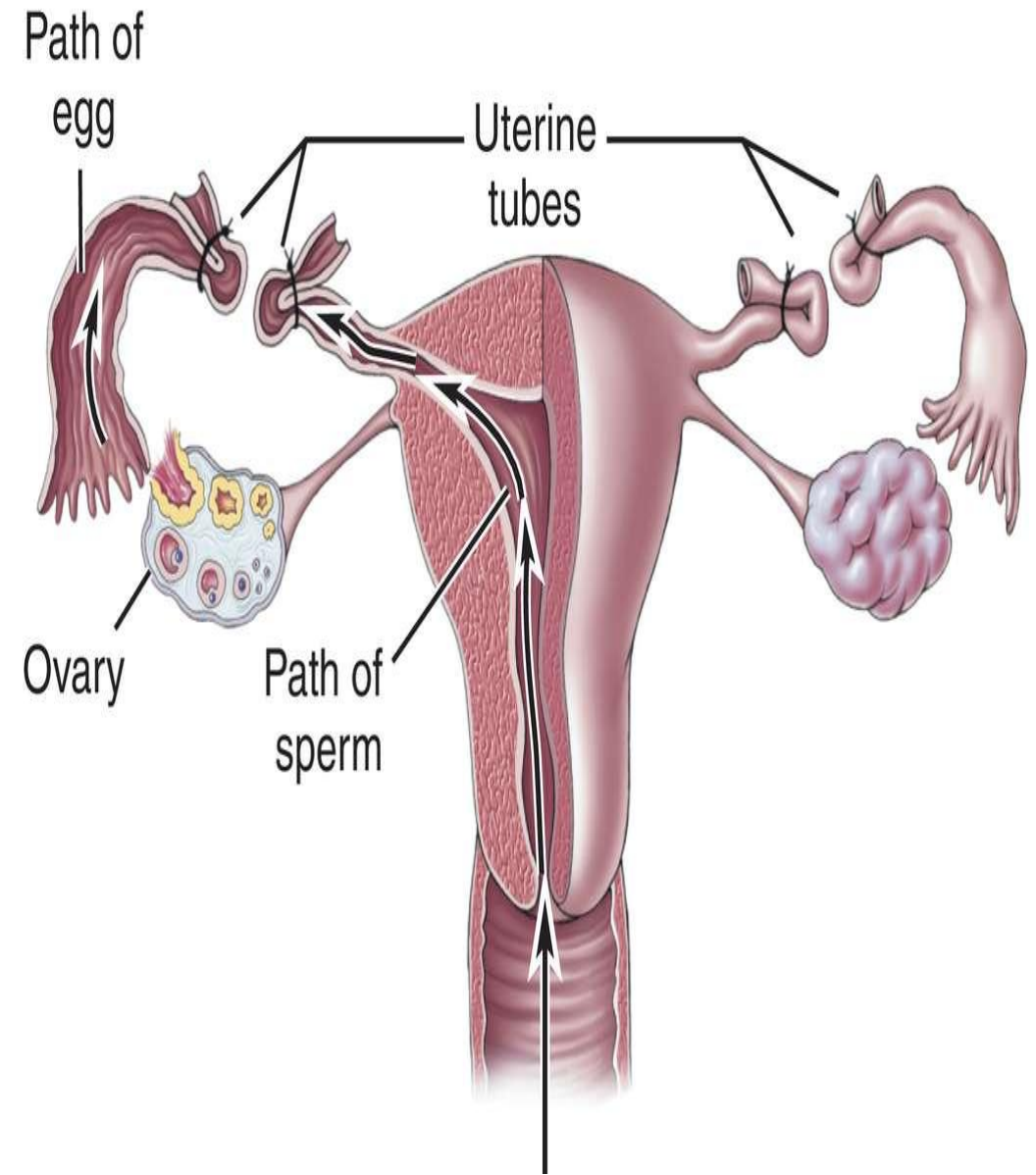
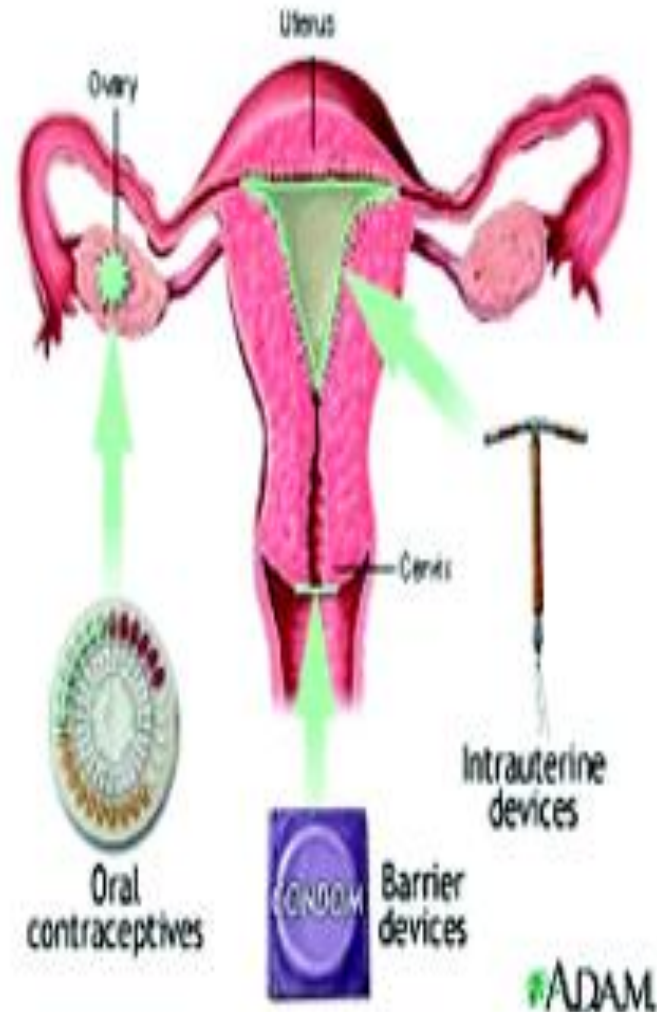
1. Chorion
2. Amnion
3. Embryo
4. Allantois
5. Yolk sac
6. Fetal part of placenta (Chorion frondosum)
7. Maternal part of placenta (Decidua basalis)
8. Chorionic villi
9. Amniotic cavity
10. Chorionic cavity

Menstrual phase (day 1-5)



METHODS

- Natural family planning
- Barrier methods
 - condom
 - diaphragm
 - cap
- Hormonal contraception
 - COCP, POP
 - Injection
 - Implants
- IUCD
- Sterilization
 - vasectomy
 - female sterilization



Birth control methods



Condom



Female
condom



Pill



Hormonal
ring



UID



Injection



Surgical
sterilization



Implant



Coitus
interruptus



Calendar rhythm
method



Patch



Diaphragm

EXTRA QUESTIONS FROM THE CHAPTER

- **Question. 1(i) What is fertilisation? Distinguish between external fertilisation and internal fertilisation.**

(ii) What is the site of fertilisation in human beings?

Answer.

(i) Fertilisation is defined as the fusion of a male gamete (sperm) with a female gamete (an ovum or egg) to form a zygote during sexual reproduction.

(ii) The site of fertilisation in human beings is in the fallopian tube of female reproductive system.

External Fertilisation	Internal Fertilisation
<ul style="list-style-type: none"> (i) The fusion of male gamete (sperm) and female gamete (ovum) occurs outside the body. (ii) Both individuals discharge their gametes outside the body. (iii) Development occurs outside the body. (iv) Example: Frog. 	<ul style="list-style-type: none"> (i) The fusion of gametes occurs inside the body. (ii) Only the male discharges sperms into female genital tract. (iii) Development occurs inside the body. (iv) Examples: Human, Birds, Cattle, etc.

EXTRA QUESTIONS FROM THE CHAPTER

- **Question.2 Define the terms unisexual and bisexual giving one example of each.**

Answer. Unisexual is the plant whose flowers contain either stamens or carpels but not both. Example: Papaya, Watermelon.

Bisexual is the plant whose flowers contain both stamens and carpels. Example: Hibiscus, Mustard.

- **Question.3 Differentiate between ‘self-pollination’ and ‘cross-pollination’. Describe double fertilisation in plants.**

Answer.

During fertilisation in plants, the following events take place:

- (i) One of the male gamete fuses with the female gamete present in the embryo sac.
- (ii) The other male gamete fuses with the two polar nuclei in the embryo sac.

The first fusion product gives rise to the zygote while the second one forms the endosperm.

The process of two fusions occurring in the embryo sac is called double fertilisation.

Self-pollination	Cross-pollination
<ul style="list-style-type: none"> (i) Self-pollination occurs within a flower or between two flowers of the same plants. (ii) Flowers do not depend on other agencies for pollination. (iii) Pollen grains are produced in small numbers. (iv) No wastage of pollen grains occur and thus, economical. (v) Flowers are not attractive nor do they produce nectar. (vi) The offsprings produced are of the same genetic make up, so purity of the race is maintained. 	<ul style="list-style-type: none"> (i) Cross-pollination occurs between two flowers borne on different plants of the same species. (ii) Agents such as insects, water and wind are required for pollination. (iii) Pollen grains are produced in large numbers. (iv) Wastage of pollen grains occurs and hence, not economical. (v) Flowers attract insects by various means like coloured petals, scent and nectar. (vi) The offsprings produced may show variations and differ in genetic make up.

EXTRA QUESTIONS FROM THE CHAPTER

- **Question.4 What is the effect of DNA copying which is not perfectly accurate on the reproduction process?**

Answer. DNA copying is not perfectly accurate and the resultant errors are a source of variations in populations of organisms.

- **Question.5 What is 'reproduction'? Mention the importance of DNA copying in reproduction.**

Answer. Reproduction is the process of producing new individuals of the same species

by existing organisms of a species, i.e. parents. The importance of DNA copying in reproduction are as follows:

- (i) DNA copying is called DNA replication. In this process, one copy each of replicated DNA will be passed to daughter cells.
- (ii) Variations may be introduced during DNA copying. This inbuilt tendency for variation during reproduction forms the basis of evolution.

-

EXTRA QUESTIONS FROM THE CHAPTER

- **Question.6 “Variations that confer an advantage to an individual organism only will survive in a population.” Justify.**

Answer. It is because the chances of survival depend on the nature of variations and different individuals have different kinds of advantages.

For example, a bacteria that can withstand heat will survive better in a heat wave, i.e. the organisms that are fit in the competitive environment and with great variations will be able to survive and adapt. Thus, more offsprings and population with genetic variations will survive.

- **Question.07 What are sexually transmitted diseases?**

Name four such diseases. Which one of them damages the immune system of human body?

Answer. Sexually Transmitted Diseases (STDs) are the diseases which are spread by sexual contact from an infected person to a healthy person. They are caused by various microorganisms that live in warm and moist environments of the vagina, urethra, anus and mouth.

The four sexually transmitted diseases are:

(i) Gonorrhoea

(ii) Syphilis

(iii) Trichomoniasis

(iv) AIDS (Acquired Immune Deficiency Syndrome).

AIDS damages the immune system of human body.

EXTRA QUESTIONS FROM THE CHAPTER

- **Question.8(a) In the human body what is the role of (i) seminal vesicles, and (ii) prostate gland?**

(b) List two functions performed by testis in human beings.

Answer. (a) The role of seminal vesicles and the prostate gland are as follows:

(i) Seminal vesicles produce seminal plasma which is in the form of fluid makes the transport of sperms smooth.

(ii) Prostate gland secretes prostatic fluid that keeps the sperms alive and helps them to swim vigorously.

(b) Two functions performed by testis in human beings are as follows:

(i) Formation of sperms takes place in testis.

(ii) They secrete the hormone testosterone which regulates the formation of sperms and brings changes in appearance of boys at the time of puberty.

EXTRA QUESTIONS FROM THE CHAPTER

- **Question.9 Name one sexually transmitted disease each caused due to bacterial infection and viral infection. How can these be prevented?**
Answer. Sexually transmitted disease caused due to
 - (i) Bacterial infection is gonorrhoea, and
 - (ii) Viral infection is AIDS (Acquired Immune Deficiency Syndrome). These diseases can be prevented by responsible sexual behaviour such as use of condom during intercourse, etc.
- **Question.10 What is regeneration? State a reason why a more complex organism cannot give rise to new individuals through this method.**
Answer. Regeneration is the ability of a fully differentiated organism to give rise to new individual organisms from its body parts. More complex organisms cannot give rise to new individuals through regeneration because:
 - (i) their body is highly complicated.
 - (ii) there are specific organs to do specific functions.
 - (iii) there is a labour division in the body of complex organisms.
 - (iv) regeneration is carried out by specialised cells which are not present in complex organisms.

EXTRA QUESTIONS FROM THE CHAPTER

Question.11 (a) Name the parts labelled A, B, C, D and E.

(b) Where do the following functions occur?

(i) Production of an egg

(ii) Fertilisation

(iii) Implantation of zygote.

(c) What happens to the lining of uterus:

(i) before release of a fertilised egg?

(ii) if no fertilisation occurs?

Answer. (a)

A – Oviduct or Fallopian tube;

B – Ovary;

C – Uterus;

D – Cervix;

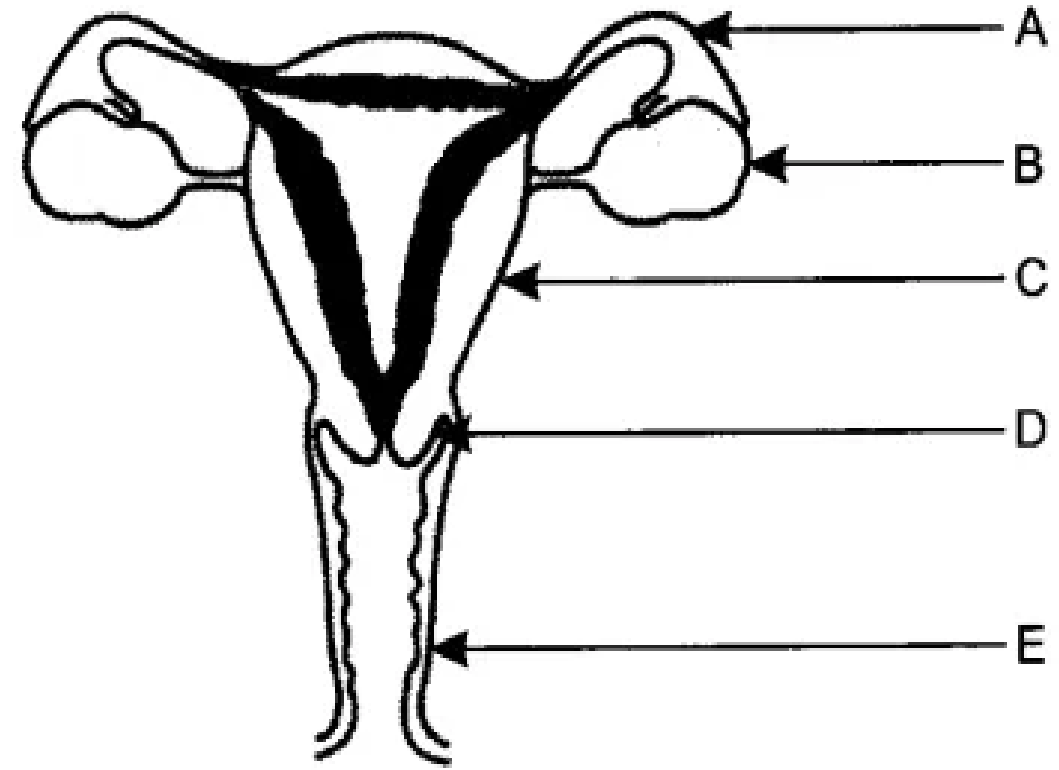
E – Vagina.

(b) (i) Ovaries; (ii) Fallopian tube;

(iii) Lining of the uterus.

(c) (i) The lining of uterus becomes

(ii) The lining of uterus slowly breaks and comes out through the vagina as blood and mucous, if no fertilisation occurs.



EXTRA QUESTIONS FROM THE CHAPTER

- **12. List any four reasons for vegetative propagation being practised in the growth of some type of plants.**

Answer.

- (i) Vegetative propagation is a cheaper, easier and more rapid method of propagation in plants than growing plants from their seeds.
- (ii) Better quality of plants can be maintained by this method.
- (iii) It results in propagation of those plants which do not produce viable seeds or produce seeds with prolonged period of dormancy.
- (iv) The plants generated from vegetative means are more uniform and genetically similar to the parent stock.

- **Question.13 Name the information source of making proteins in the cell. State two basic events in reproduction.**

Answer. The DNA in the cell nucleus is the information source of making proteins.

The two basic events in reproduction are:

- (i) Creation of a DNA copy,
- (ii) Additional cellular apparatus by the cell involved in the process.

- **Question.14 State the method used for growing rose plants.**

Answer. Artificial methods of vegetative propagation like cutting are used to grow rose plants.