UNIT 17

REPRODUCTION IN PLANTS AND ANIMALS

Points to Remember

- Many bacteria and protozoa simply divide into two or more daughter cells by fission.
- Organisms such as hydra can regenerate if they are broken into pieces. They can also give out buds which mature into new individuals.
- Reproduction in flowering plants involves transfer of pollen grains from the anther to the stigma which is referred to as pollination. This is followed by fertilization.
- Sexual reproduction involves the fusion of two haploid gametes (male and the female gametes) to form a diploid individual (zygote).
- The formation of the sperm in male and the ovum in female is called gametogenesis. It involves spermatogenesis (formation of spermatozoa) and oogenesis (the formation of ova).
- The cyclic events that take place in a rhythmic manner during the reproductive period of a woman's life is called menstrual cycle.
- The process of attachment of the blastocyst to the uterine wall (endometrium) is called implantation.
- The placenta is a temporary association between the developing embryo and maternal tissues.
- Parturition is the expulsion of young one from the mother's uterus.
- Contraception is one of the best birth control measures. The devices used for contraception are called contraceptive devices.

TEXT BOOK EVALUATION

I. Book Exercise – Choose the best answer

1. The plant which propagates with the help of its leaves is _____.

a) Onion b) Neem c) Ginger d) Bryophyllum

Ans : (d) Bryophyllum

2. Asexual reproduction takes place through budding in _____.

a) Amoeba b) Yeast c) Plasmodium d) Bacteria

Ans : (b) Yeast

3. Syngamy results in the formation of _____.

a) Zoospores b) Conidia c) Zygote d) Chlamydospores

Ans : (c) Zygote

4. The essential parts of a flower are _____.

a) Calyx and Corolla b) Calyx and Androecium

c) Corolla and Gynoecium d) Androecium and Gynoecium

Ans : (d) Androecium and Gynoecium

5. Anemophilous flowers have _____.

a) Sessile stigma b) Small smooth stigma c) Colored flower d) Large feathery stigma

Ans : (d) Large feathery stigma

6. Male gametes in angiosperms are formed by the division of _____.

a) Generative cell b) Vegetative cell c) Microspore mother cell d) Microspore

Ans : (a) Generative cell

7. What is true of gametes?

a) They are diploid
b) They give rise to gonads
c) They produce hormones
d) They are formed from gonads

Ans : (d) They are formed from gonads

8. A single highly coiled tube where sperms are stored, get concentrated and mature is known as

a) Epididymis
b) Vasa efferentia
c) Vas deferens
d) Seminiferous tubules

Ans : (a) Epididymis

9. The large elongated cells that provide nutrition to developing sperms are

a) Primary germ cells
b) Sertoli cells
c) Leydig cells
d) Spermatogonia

Ans : (b) Sertoli cells

10. Estrogen is secreted by

a) Anterior pituitary
b) Primary follicle
c) Graffian follicle
d) Corpus luteum

Ans : (c) Graffian follicle

11. Which one of the following is an IUCD?

a) Copper – T
b) Oral pills
c) Diaphragm
d) Tubectomy

Ans : (a) Copper – T

II. Book Exercise – Fill in the blanks

1. The embryo sac in a typical dicot at the time of fertilization is _____. **Ans :** 7 Celled
2. After fertilization the ovary develops into _____. **Ans :** Fruit
3. Planaria reproduces asexually by _____. **Ans :** Regeneration
4. Fertilization is _____ in humans. **Ans :** Internal
5. The implantation of the embryo occurs at about _____ days of fertilization. **Ans :** 6 – 7 days
6. _____ is the first secretion from the mammary gland after child birth. **Ans :** Colostrum
7. Prolactin is a hormone produced by _____. **Ans :** Pituitary gland

III. Book Exercise – Match the following

A) Match Column I with II

COLUMN–I	**COLUMN–II**
Fission	**Spirogyra**
Budding	**Amoeba**
Fragmentation	**Yeast**

Ans :

Column I	Column II
Fission	Amoeba
Budding	Yeast
Fragmentation	Spirogyra

B) Match the following terms with their respective meanings

1.	**Parturition**	**(a)**	**Duration between pregnancy and birth**
2.	**Gestation**	**(b)**	**Attachment of zygote to endometrium**
3.	**Ovulation**	**(c)**	**Delivery of baby from uterus**
4.	**Implantation**	**(d)**	**Release of egg from Graafian follicle**

Ans :

1	Parturition	c	Delivery of baby from uterus
2	Gestation	a	Duration between pregnancy and birth
3	Ovulation	d	Release of egg from Graafian follicle
4	Implantation	b	Attachment of zygote to endometrium

IV. Book Exercise – True or false (If false give the correct statement)

1. **Stalk of the ovule is called pedicle.**
   Ans : False. Stalk of the ovule is called **funiculus**.
2. **Seeds are the product of asexual reproduction.**
   Ans : False. Seeds are the product of **sexual** reproduction.
3. **Yeast reproduces asexually by means of multiple fission.**
   Ans : False. Yeast reproduces asexually by means of **budding**.
4. **The part of the pistil which serves as a receptive structure for the pollen is called as style.**
   Ans : False. The part of the pistil which serves as a receptive structure for the pollen is called as **stigma**.
5. **Insect pollinated flowers are characterized by dry and smooth pollen.**
   Ans : False. **Wind** pollinated flowers are characterized by dry and smooth pollen.
6. **Sex organs produce gametes which are diploid.**
   Ans : False. Sex organs produce gametes which are **haploid**.
7. **LH is secreted by the posterior pituitary.**
   Ans : False. LH is secreted by the **anterior** pituitary.
8. **Menstrual cycle ceases during pregnancy.**
   Ans : True.
9. **Surgical methods of contraception prevent gamete formation.**
   Ans : False. Surgical methods of contraception prevent gametes **transportation**.
10. **The increased level of estrogen and progesterone is responsible for menstruation.**
    Ans : False. The **decreased** level of estrogen and progesterone is responsible for menstruation.

V. Book Exercise – Answer in a sentence (1 mark)

1. **If one pollen grain produces two male gametes, how many pollen grains are needed to fertilize 10 ovules?**
   Ten pollen grains are needed to fertilize 10 ovules. Because two sperms of each pollen grain are needed to fertilize each ovule during the process of double fertilization.
2. **In which part of the flower germination of pollen grains takes place?**
   Germination of pollen grains takes place on the stigmatic surface of the flower.
3. **Name two organisms which reproduces through budding.**
   Budding takes place in
   - ❖ Yeast
   - ❖ Bryophyllum
4. **Mention the function of endosperm.**
   Endosperm is the nutritive tissue. It provides food to the developing embryo.
5. **Name the hormone responsible for the vigorous contractions of the uterine muscles.**
   Oxytocin from the posterior pituitary stimulates the uterine contractions and provides force to expel the baby from the uterus, causing birth.
6. **What is the enzyme present in acrosome of sperm?**
   Acrosome contains hyaluronidase, an enzyme that helps the sperm to enter the ovum during fertilization.
7. **When is World Menstrual Hygiene Day observed?**
   Every year May 28 is observed World Menstrual Hygiene Day.
8. **What is the need for contraception ?**
   Contraception is one of the best birth control measures. Contraception is needed to follow the small family norms, which improve economic status, living status and the quality of life.

9. Name the part of the human female reproductive system where the following occurs.

a. Fertilization.

Fertilization : Fertilization occurs in the oviduct particularly in ampulla of fallopian tube.

b. Implantation.

Implantation : Fertilized egg gets implanted in the uterus.

VII. Book Exercise – Short answer question (2 mark)

1. What will happen if you cut planaria into small fragments?

If we cut a Planaria into small fragments, over time each piece will regenerate into a complete worm by the process regeneration.

2. Why is vegetative propagation practiced for growing some type of plants?

Vegetative propagation is practiced for growing some type of plants, becuse

- ❖ Some plants have reduced power of sexual reproduction.
- ❖ Seeds of some plants have long dormant period or poor viability.
- ❖ It is a rapid and easier method.
- ❖ Good characters can be preserved.

3. How does binary fission differ from multiple fission?

S.No.	Binary fission	Multiple fission
1	A single parent cell divides into two daughter cells	A single parent cell divides into many daughter cells
2	It occurs during favourable conditions eg: Amoeba	It occurs during unfavourable conditions eg: Plasmodium

4. Define triple fusion.

The fusion of second sperm (n) with secondary nucleus (2n) is known as triple fusion. As the result of triple fusion endosperm nucleus is formed.

Second sperm (n) + Secondary nucleus (2n) = Endosperm nucleus (3n).

5. Write the characteristics of insect pollinated flowers.

The characteristics of insect pollinated flowers or Entamophilous flower.

- ❖ To attract insects these flowers are brightly coloured, have smell and nectar.
- ❖ The pollen grains are larger in size, the exine is pitted, spiny etc., so they can be adhered firmly on the sticky stigma.

6. Name the secondary sex organs in male.

The secondary sex organs in male are;

- ❖ Epididymis.
- ❖ Vas deferens.
- ❖ Seminal vesicles.
- ❖ Sperm duct.
- ❖ Prostate gland.
- ❖ Cowper's gland.
- ❖ Urethra and
- ❖ Penis.

7. What is colostrum? How is milk production hormonally regulated ?

- ❖ The first fluid which is released from the mammary gland after child birth is called as colostrum.
- ❖ Milk production from alveoli of mammary glands is stimulated by prolactin secreted from the anterior pituitary. The ejection of milk is stimulated by posterior pituitary hormone oxytocin.

8. How can menstrual hygiene be maintained during menstrual days?

Maintaining menstrual hygiene is important for the overall health of women. The basic menstrual hygiene ways are;

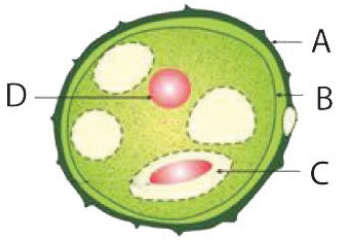
- ❖ Sanitary pads should be changed regularly, to avoid infections due to microbes from vagina and sweat from genitals.

- ❖ Use of warm water to clean genitals helps to get rid of menstrual cramps.
- ❖ Wearing loose clothing rather than tight fitting clothes will ensure the airflow around the genitals and prevent sweating.

9. How does developing embryo gets its nourishment inside the mother's body?

- ❖ After fertilization, the lining of uterus thickens and is richly supplied with blood to nourish the growing embryo.
- ❖ The embryo gets nutrition from the mother's blood with the help of special tissue called placenta.
- ❖ Umbilical cord connects the placenta and foetus.

10. Identify the parts A, B, C and D



A : Exine.
B : Intine.
C : Generative cell.
D : Vegetative nucleus.

11. Write the events involved in the sexual reproduction of a flowering plant.

a. Discuss the first event and write the types.

i) **Process of sexual reproduction in flowering plants. It involves :**

- ❖ Pollination.
- ❖ Fertilization.

ii) **Pollination :** The transfer of pollen grains from anther to stigma of a flower is called as pollination.

Types of Pollination :

- ❖ **Self-pollination (Autogamy) :** The transfer of pollen grains from the anther to the stigma of same flower or another flower borne on the same plant is known as self-pollination.
- ❖ **Cross pollination (Allogamy) :** Cross-pollination is the transfer of pollen from the anthers of a flower to the stigma of a flower on another plant of the same species**.**

b. Mention the advantages and the disadvantages of that event.

Advantages of self-pollination

- ❖ Self-pollination is possible in certain bisexual flowers.
- ❖ Flowers do not depend on agents for pollination.
- ❖ There is no wastage of pollen grains.

Disadvantages of self-pollination

- ❖ The seeds are less in numbers.
- ❖ The endosperm is minute. Therefore, the seeds produce weak plants.
- ❖ New varieties of plants cannot be produced

Advantages of cross pollination

- ❖ The seeds produced as a result of cross pollination, develop and germinate properly and grow into better plants, i.e. cross pollination leads to the production of new varieties.
- ❖ More viable seeds are produced.

Disadvantages of cross-pollination

- ❖ Pollination may fail due to distance barrier.
- ❖ More wastage of pollen grains.
- ❖ It may introduce some unwanted characters.
- ❖ Flowers depend on the external agencies for pollination**.**

12. Why are the human testes located outside the abdominal cavity? Name the pouch in which they are present.

Human testes responsible for formation of sperms (Spermatogenesis) need slightly lower temperature than the normal body temperature for this function. So human testes are located outside the abdominal cavity in sac-like structure called scrotum.

13. Luteal phase of the menstrual cycle is also called the secretory phase. Give reason.

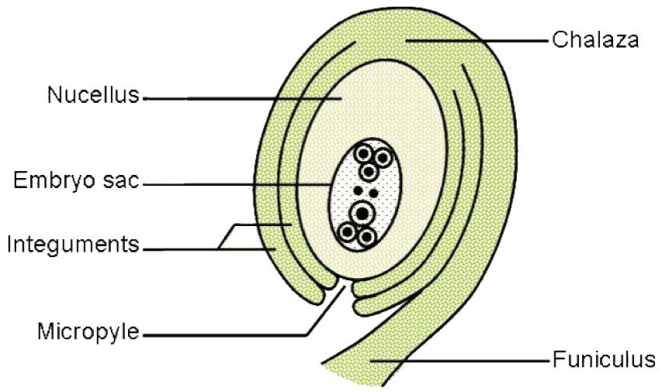
The luteal phase is the second half of the menstrual cycle, in which fertilisation and implantation may occur. Female hormones like estrogen and progesterone secreted in peak level because ovulation have to occur and they provide conditions for implantation. For this reason, Luteal phase of the menstrual cycle is called the secretory phase.

14. Why are family planning methods not adopted by all the people of our country?

- ❖ Due to lack of awareness about family planning.
- ❖ Myths and misconceptions about family planning.
- ❖ Long distance to Health facility.
- ❖ Unavailability of preferred contraceptive methods.
- ❖ high cost of managing side effects.
- ❖ Desire for big family size.

VII. Book Exercise – Long answer question (5 mark)

1. With a neat labelled diagram describe the parts of a typical angiospermic ovule.



- ❖ The main part of the ovule is the nucellus which is enclosed by two integuments leaving an opening called as micropyle.
- ❖ The ovule is attached to the ovary wall by a stalk known as funiculus.
- ❖ Chalaza is the basal part.
- ❖ The embryo sac contains seven cells and the eighth nuclei located within the nucellus.
- ❖ Three cells at the micropylar end form the egg apparatus and the three cells at the chalaza end are the antipodal cells.
- ❖ The remaining two nuclei are called polar nuclei found in the centre.
- ❖ In the egg apparatus one is the egg cell (female gamete) and the remaining two cells are the synergids.

2. What are the phases of menstrual cycle? Indicate the changes in the ovary and uterus.

S.No.	Phase	Days	Changes in Ovary	Changes in Uterus
1	Menstrual phase	4–5 days	Development of primary follicles	Breakdown of uterine endometrial lining leads to bleeding
2	Follicular phase	6^{th} – 13^{th} day	Primary follicles grow to become a fully mature Graafian follicle	endometrium regenerates through proliferation

S.No.	Phase	Days	Changes in Ovary	Changes in Uterus
3	Ovulatory phase	14^{th} day	The Graafian follicle ruptures and releases the ovum (egg)	Increase in endometrial thickness
4	Luteal phase	15^{th} – 28^{th} day	Emptied Graafian follicle develops into corpus luteum	Endometrium is prepared for implantation if fertilization of egg takes place, if fertilization does not occur corpus luteum degenerates, uterine wall ruptures, bleeding starts and unfertilized egg is expelled

VIII. Book Exercise – Higher Order Thinking Skills (HOTS)

1. In angiosperms the pollen germinates to produce pollen tube that carries two gametes. What is the purpose of carrying two gametes when single gamete can fertilize the egg?

Double fertilization requires two sperm cells; one to fertilize the egg cell and thereby to form the zygote, while the other sperm to fuse with the secondary nucleus to form the endosperm. That's why two sperms are needed for the process of sexual reproduction in angiosperm.

2. Why menstrual cycle does not take place before puberty and during pregnancy ?

- ❖ When a baby girl is born, her ovaries contain hundreds of thousands of eggs, which remain inactive until puberty begins. Only at the time of puberty (age of 11-13 years), the pituitary gland starts making hormones (LH and FSH) that stimulate the ovaries to produce female sex hormones, including estrogen and progesterone. These hormones are responsible for first menstruation (Menarche). That's why menstrual cycle does not take place before puberty.
- ❖ Lack of menstruation generally indicates pregnancy. If fertilization takes place the corpus luteum persists, continues to secrete progesterone maintains the thickened state of uterine wall and prevents maturation of another follicle till the end of pregnancy. That's why menstrual cycle does not take place during pregnancy.

3. Read the following passage and answer the questions that follow Rahini and her parents were watching a television programme. An advertisement flashed on the screen which was promoting use of sanitary napkins. Rahini's parents suddenly changed the channel, but she objected to her parents and explained the need and importance of such advertisement.

a) What is first menstruation called? When does it occur ?

b) List out the napkin hygiene measures taken during menstruation ?

c) Do you think that Rahini's objection towards her parents was correct? If so, Why?

a) First menstruation is called menarche. The first menstruation occurs at the age of 11-13 years.

b) Girls should be educated about napkin hygiene in the following ways

- ❖ The sanitary pad and tampons should be wrapped properly and discarded because they can spread infections.
- ❖ Sanitary pad or tampon should not be flushed down the toilet.
- ❖. Napkin incinerators are to be used properly for disposal of used napkins.

c) Yes. Rahini's objection towards her parents was correct. Rahini's parents should not change channel, instead they must explain about the use of napkins and their proper disposal.

Additional – Choose the best answer

1. The cell division takes place during vegetative reproduction is _____.

a) Amitosis b) Mitosis c) Meiosis d) Non of the above

Ans : (b) Mitosis

2. In Sweet potato, vegetative propagation takes place by

a) Root b) Buds c) Flower d) Leaf

Ans : (a) Root

3. In this type of reproduction, the parent cell divides into two daughter cells and each cell develops into a new adult organism.

a) Budding b) Bulbils c) Regeneration d) Fission

Ans : (d) Fission

4. The method which is common for Hydra and Planaria is

a) Fission b) Budding c) Regeneration d) None of the above

Ans : (c) Regeneration

5. Asexual reproduction mostly occurs by _____ formation.

a) Spore b) Egg c) Sperm d) Zygote

Ans : (a) Spore

6. Asexual reproduction is common in

a) Fungi b) Algae c) Bacteria d) All the above

Ans : (d) All the above

7. A mature _____ contains two cells, the vegetative and the generative cell.

a) Ovule b) Pollen grain c) Ovary d) Anther

Ans : (b) Pollen grain

8. One of the following is not the part of carpel.

a) Ovary b) Anther c) Style d) Stigma

Ans : (b) Anther

9. _____ is the basal part of the ovule.

a) Integument b) Funiculus c) Chalaza d) Micropyle

Ans : (c) Chalaza

10. The embryo sac contains _____ cells.

a) 4 b) 5 c) 6 d) 7

Ans : (d) 7

11. The first event of sexual reproduction in plant is _____.

a) Fertilization b) Pollination c) Zygote formation d) Pollen germination

Ans : (b) Pollination

12. The stigmas are comparatively large , protruding and sometimes hairy to trap the pollen grains in _____ flowers.

a) Hydrophilous b) Entamophilous c) Zoophilous d) Anemophilous

Ans : (d) Anemophilous

13. Find the anemophilous

a) Hibiscus b) Hydrilla c) Grass d) Canna

Ans : (c) Grass

14. _____ flowers are brightly coloured, have smell and nectar.

a) Hydrophilous b) Entamophilous c) Zoophilous d) Anemophilous

Ans : (b) Entamophilous

15. The pollen grains of _____ flowers are larger in size, the exine is pitted, spiny etc., so they can be adhered firmly on the sticky stigma.

a) Hydrophilous b) Entamophilous c) Zoophilous d) Anemophilous

Ans : (b) Entamophilous

16. Approximately, 80% of the pollination done by the insects is carried by _____.

a) Grasshopper b) Honey bees c) Housefly d) Dragonfly

Ans : (b) Honey bees

17. Endosperm nucleus is triploid in nature.

a) Haploid b) Diploid c) Triploid d) Tetraploid

Ans : (c) Triploid

18. In angiosperms, the fusion of second sperm with secondary nucleus is known as _____.

a) Fertilization b) Double fertilization c) Triple fusion d) All the above

Ans : (c) Triple fusion

19. Since two types of fusion, syngamy and triple fusion take place in an embryo sac the process is termed as

a) Fertilization b) Double fertilization c) Triple fusion d) All the above

Ans : (b) Double fertilization

20. Sperm production begins in the

a) Seminiferous tubules b) Epididymis c) Vas deferens d) Ejaculatory duct

Ans : (a) Seminiferous tubules

21. The cell produced by fertilization is called

a) gamete b) embryo c) fetus d) zygote

Ans : (d) zygote

22. The primary sex organ is known as _____

a) Penis b) Urethra c) Fallopian tube d) Gonads

Ans : (d) Gonads

23. Which of the following produces the male sex hormone?

a) Rete testis b) Seminiferous tubule c) Leydig cell d) Scrotum

Ans : (c) Leydig cell

24. Out of the following, which hormone does not secret from corpus luteum?

a) Estrogen b) Progesterone c) Relaxin d) Testosterone

Ans : (d) Testosterone

25. Name the hormone which is at peak during ovulation.

a) Progesterone b) Estrogen c) FSH d) LH View Answer

Ans : (c) FSH

26. Name the site of sperm maturation?

a) Epididymis b) Ductus deferens c) Spermatic cord d) Urethra

Ans : (a) Epididymis

27. Which of the following gland is seen in male reproductive system ?

a) Seminal vesicle b) Prostate gland c) Bulbourethral gland d) All of these

Ans : (d) All of these

28. Where seminiferous tubules of each lobe empty sperms ?

a) Vas deference b) Vasa efferentia c) Epididymus d) Seminal vesicles

Ans : (b) Vasa efferentia

29. Function of epididymis is _____

a) A temporary storage site
b) For the immature sperms complete their maturation process
c) Gain the ability of swimming (motility)
d) All of these

Ans : (d) All of these

30. Gametes with _____ cells are produced through gametogenesis.

a) Haploid b) Diploid c) Triploid d) None of the above

Ans : (a) Haploid

31. Stroma of ovary is lined by the _____ epithelium.

a) Squamous b) Germinal c) Columnar d) Glandular

Ans : (b) Germinal

32. The number of primordial follicles in new born female child ranges over _____.

a) 7000 b) 70000 c) 7 Lakhs d) 7 million

Ans : (d) 7 million

33. In human females the menstrual cycle starts at the age of _____ years.

a) 11–13 b) 15–16 c) 18–20 d) 21–23

Ans : (a) 11–13

34. The phase of menstrual cycle in which, the Graafian follicle ruptures, and releases the ovum(egg) is

a) Menstrual or Destructive Phase b) Follicular or Proliferative Phase
c) Ovulatory Phase d) Luteal or Secretory Phase

Ans : (c) Ovulatory Phase

35. The phase of menstrual cycle in which, development of primary follicles takes place

a) Menstrual or Destructive Phase b) Follicular or Proliferative Phase
c) Ovulatory Phase d) Luteal or Secretory Phase

Ans : (a) Menstrual or Destructive Phase

36. The phase of menstrual cycle in which, primary follicles grow to become a fully mature Graafian follicle is

a) Menstrual or Destructive Phase b) Follicular or Proliferative Phase
c) Ovulatory Phase d) Luteal or Secretory Phase

Ans : (b) Follicular or Proliferative Phase

37. The phase of menstrual cycle in which, emptied Graafian follicle develops into corpus luteum is

a) Menstrual or Destructive Phase b) Follicular or Proliferative Phase
c) Ovulatory Phase d) Luteal or Secretory Phase

Ans : (d) Luteal or Secretory Phase

38. The first cleavage in zygote takes place about _____ hours after fertilization.

a) 2 b) 10 c) 30 d) 90

Ans : (c) 30

39. The blastocyst gets implanted in the _____.

a) Ovary b) Fallopian tube c) Uterus d) Vagina

Ans : (c) Uterus

40. _____ is the expulsion of young one from the mother's uterus at the end of gestation.

a) Gestation b) Parturition c) Implantation d) Ovulation

Ans : (b) Parturition (Child Birth)

41. Milk production from alveoli of mammary glands is stimulated by _____ secreted from the anterior pituitary.

a) Prolactin b) Oxytocin c) Estrogen d) Progesterone

Ans : (a) Prolactin

42. The ejection of milk is stimulated by posterior pituitary hormone _____.

a) Prolactin b) Oxytocin c) Estrogen d) Progesterone

Ans : (b) Oxytocin

43. India launched the nation wide family planning programme in the year _____.

a) 1945 b) 1947 c) 1952 d) 1966

Ans : (c) 1952

Additional – Fill in the blanks

1. Reproduction is to preserve individual species and it is called as _____. **Ans :** Self-perpetuation
2. During spore formation in fungi, a structure called _____ develops from the hypha. **Ans :** Sporangium
3. A _____ is a modified shoot with limited growth to carry out sexual reproduction. **Ans :** Flower
4. All the four whorls of the flower borne on a _____. **Ans :** Thalamus
5. A group of sepals forms _____. **Ans :** Calyx
6. A group of petals forms _____. **Ans :** Corolla
7. The male part of flower is _____. **Ans :** Androecium
8. Androecium is composed of _____. **Ans :** Stamens
9. In Agave, the flower bud modifies into globose bulb which are called as _____. **Ans :** Bulbils
10. The process of breaking of the filamentous algae Spirogyra into many pieces is called _____. **Ans :** Fragmentation
11. The ability of the lost body parts of an individual organism to give rise to an whole new organism is called _____. **Ans :** Regeneration
12. Offspring produced by _____ reproduction are not only identical to parents but are also exact copies of their parent. **Ans :** Asexual
13. The pollination with the help of water is called _____. **Ans :** Hydrophily
14. The female part of the flower is _____. **Ans :** Gynoecium
15. Gynoecium or pistil is composed of _____. **Ans :** Carpels
16. The outermost whorl of the flower is _____. **Ans :** Calyx
17. Androecium and gynoecium are known as the _____ whorls, because both take part directly in reproduction. **Ans :** Essential
18. Stalk of the stamen is called the _____. **Ans :** Filament
19. Pollen grains bearing small bag like structure of stamen is called _____. **Ans :** Anther
20. The pollen grains are produced in the anther within the _____. **Ans :** Pollen sac
21. The hard-outer layer of pollen grain is known as _____. **Ans :** Exine
22. Exine of pollen has prominent apertures called _____. **Ans :** Germpore
23. The inner thin layer of pollen grain is known as _____. **Ans :** Intine
24. The _____ cell of pollen grain divides mitotically to form two male gametes or sperms. **Ans :** Generative
25. The stalk of the ovule is _____. **Ans :** Funiculus

26. The opening present in the ovule is _____. **Ans :** Micropyle
27. The nucellus of the ovule is enclosed by two _____. **Ans :** Integuments
28. The eighth nuclei of the ovule is located within the _____. **Ans :** Nucellus
29. Three cells at the micropylar end of ovule form the _____. **Ans :** Egg apparatus
30. The three cells at the chalaza end of the ovule are known as the _____. **Ans :** Antipodal cells
31. The two nuclei found in the centre of the embryo sac are _____. **Ans :** Polar nuclei
32. The two haploid polar nuclei fuse to form the diploid _____ nucleus. **Ans :** Secondary
33. In the egg apparatus one is the egg cell (female gamete) and the remaining two cells are the _____. **Ans :** Synergids
34. The transfer of pollen grains from anther to stigma of a flower is called as _____. **Ans :** Pollination
35. New varieties of plants are formed through new combination of genes in case of _____ pollination. **Ans :** Cross
36. Self-pollination is certain in _____ flowers. **Ans :** Bisexual
37. As the _____ is minute in self pollinated seeds, they produce weak plants. **Ans :** Endosperm
38. _____ pollination leads to the production of new varieties. **Ans :** Cross
39. The pollination with the help of wind is called _____. **Ans :** Anemophily
40. Pollination in grasses and some cacti is carried out by _____. **Ans :** Wind
41. Pollination with the help of insects like honey bees, flies are called _____. **Ans :** Entomophily
42. In Hydrilla and Vallisneria flowers are pollinated by _____. **Ans :** Water
43. When pollination takes place with the help of animals, it is called _____. **Ans :** Zoophily
44. Flowers of Canna and Gladioli are pollinated by _____. **Ans :** Sun bird
45. Flowers of silk cotton tree are pollinated by _____. **Ans :** Squirrels
46. During the germination of pollen grain, a pollen tube emerges through the _____. **Ans :** Germ pore
47. After fertilization, the ovule develops into a _____. **Ans :** Seed
48. After fertilization, the integuments of the ovule develop into the _____. **Ans :** Seed coat
49. After fertilization, the _____ enlarges and develops into a fruit. **Ans :** Ovary
50. Pollen tube grows through stylar tissue and finally reaches the ovule through the opening called _____. **Ans :** Micropyle
51. As the result of fusion of first sperm and the egg (syngamy) a diploid _____ is formed. **Ans :** Zygote
52. As the result of triple fusion, _____ is formed. **Ans :** Endosperm nucleus
53. As the result of _____, zygote and endosperm nucleus are formed. **Ans :** Double fertilization
54. In angiosperm, _____ provides food to the developing embryo. **Ans :** Endosperm
55. Primary reproductive organs of male are _____. **Ans :** Testes
56. Primary reproductive organs of female are _____. **Ans :** Ovaries
57. Vas deferens, epididymis, seminal vesicle, prostate gland and penis are the _____ sex organs of male. **Ans :** Accessory / Secondary
58. Fallopian tubes, uterus, cervix and vagina are the _____ sex organs of female. **Ans :** Accessory / Secondary
59. Testes lie outside the abdominal cavity of a man in a sac like structure called _____. **Ans :** Scrotum
60. Each testes is covered with a layer of fibrous tissue called _____. **Ans :** Tunica albuginea
61. The process of spermatogenesis takes place in the _____ of the testes. **Ans :** Seminiferous tubules
62. The _____ cells provide nutrients to the developing sperms. **Ans :** Sertoli
63. The _____ cells lie between the seminiferous tubules secrete testosterone. **Ans :** Leydig

64. The hormone _____ produced by the Leydig cells initiates the process of spermatogenesis.
Ans : Testosterone
65. The cortex of ovary is composed of a network of connective tissue called as _____. **Ans :** Stroma
66. The epithelial cells called the _____ cells surround each ovum in the ovary together forming the primary follicle. **Ans :** Granulosa
67. A nest of cells in the ovary that develops into a fluid-filled cyst containing a maturing egg (ovum) is known as _____. **Ans :** Graafian follicle
68. A woman ovulates only _____ to _____ eggs during her lifetime. **Ans :** 300 to 400
69. Men produce over _____ billion sperms in their lifetime. **Ans :** 500
70. The formation of the sperm in male and the ovum in female is called _____. **Ans :** Gametogenesis
71. Formation of spermatozoa is known as _____. **Ans :** Spermatogenesis
72. The formation of ova is known as _____. **Ans :** Oogenesis
73. A cap structure at the anterior portion of sperm is called as _____. **Ans :** Acrosome
74. Acrosome contains the enzyme _____. **Ans :** Hyaluronidase
75. The enzyme which helps the sperm to enter the ovum during fertilization is _____.
Ans : Hyaluronidase
76. Middle piece of the sperm is made up of _____. **Ans :** Centrioles
77. The middle piece contains the _____ which provides energy for the movement of tail.
Ans : Mitochondria
78. The membrane that surrounds the outer surface of the plasma membrane of an ovum is _____.
Ans : Vitelline membrane
79. The membrane that surrounds a fertilized ovum and prevents the entry of other spermatozoa is _____. **Ans :** Vitelline membrane
80. The plasma membrane of ovum is surrounded by a thin glycoprotein layer layer known as _____.
Ans : Zona pellucid
81. Outer thick layer of ovum, _____ is formed of follicle cells. **Ans :** Corona radiata
82. The fluid-filled space between zona pellucida and the surface of the egg is called _____.
Ans : Perivitelline space
83. The period during which adolescents reach sexual maturity and become capable of reproduction is known as _____. **Ans :** Puberty
84. In male, the onset of puberty is triggered by the secretion of the hormone _____. **Ans :** Testosterone
85. In female, the onset of puberty is triggered by the secretion of _____ and _____.
Ans : Estrogens and progesterone
86. The cyclic events that take place in a rhythmic fashion during the reproductive period of a woman's life is called _____. **Ans :** Menstrual cycle
87. The onset of puberty is called _____. **Ans :** Menarche
88. The ceasing of menstruation is known as _____. **Ans :** Menopause
89. The ceasing of menstruation or menopause occurs around _____ years. **Ans :** 48–50
90. Menstruation will happen if the released _____ is not fertilized by the sperm. **Ans :** Ovum
91. Lack of menstruation between the age 11 to 48 generally indicates _____. **Ans :** Pregnancy
92. The rupture of the follicle to release the egg or ovum is known as _____. **Ans :** Ovulation
93. The uterine lining becomes thick and spongy for _____ of the fertilized egg. **Ans :** Implantation
94. Fertilization in human is _____ as it occurs in the oviduct of the female genital tract. **Ans :** Internal
95. Fertilization takes place usually in the _____ of the fallopian tube. **Ans :** Ampulla
96. An oocyte is alive for about _____ hours after it is released from the follicle. **Ans :** 24

97. Series of rapid mitotic divisions (Cleavage) of the zygote leads to form many celled _____.
Ans : Blastula (Blastocyst)

98. The process of attachment of the blastocyst to the uterine wall (endometrium) is called _____.
Ans : Implantation

99. The transformation of blastula into gastrula and the formation of primary germ layers (ectoderm, mesoderm and endoderm) by rearrangement of the cells is called _____. **Ans :** Gastrulation

100. Formation of the various organs of the foetus from ectoderm, mesoderm and endoderm is termed as _____. **Ans :** Organogenesis

101. The _____ is a temporary association between the developing embryo and maternal tissues.
Ans : Placenta

102. _____ allows the exchange of food materials, diffusion of oxygen, excretion of nitrogenous wastes and elimination of carbon dioxide between the developing embryo and maternal tissues. **Ans :** Placenta

103. A cord containing blood vessels that connects the placenta with the foetus is called the _____.
Ans : Umbilical cord

104. The time period during which the embryo attains its development in the uterus is known as _____.
Ans : Pregnancy or Gestation

105. Normally gestation period of human last for about _____ days. **Ans :** 280

106. _____ from the posterior pituitary stimulates the uterine contractions and provides force to expel the baby from the uterus, causing birth. **Ans :** Oxytocin

107. The process of milk production after child birth from mammary glands of the mother is called _____.
Ans : Lactation

108. The first fluid which is released from the mammary gland after child birth is called as _____.
Ans : Colostrum

109. _____twins develop when a single egg is fertilised and then divides into two foetus. **Ans :** Identical

110. The milk produced from the breast during the first 2 to 3 days after child birth is called _____ which contains immune substances and provides immunity to the new born. **Ans :** Colostrum

111. _____ is inserted into the vagina and fits snugly over the cervix to prevent the entry of sperms into the uterus. **Ans :** Diaphragm (Cervical cap)

112. Cystitis or Bladder infection is caused by _____. **Ans :** Bacteria

113. Two synthetic intrauterine devices (IUD) commonly used in India are _____ and _____.
Ans : Lippe's Loop and Copper-T

114. _____ reduces the sperm fertilizing capacity and prevents implantation. **Ans :** Copper-T

115. Surgical contraception method in male is known as _____. **Ans :** Vasectomy (ligation of vas deferens)

116. Surgical contraception or sterilization technique in females is known as _____.
Ans : Tubectomy (ligation of fallopian tube)

Additional – Match the following

1. Reproduction in plants :

1.	**Bryophyllum**	**(a)**	**Ornithophily**
2.	**Strawberry**	**(b)**	**Bulbils**
3.	**Asparagus**	**(c)**	**Entomophily**
4.	**Agave**	**(d)**	**Allogamy**
5.	**Planaria**	**(e)**	**Stem propagation**
6.	**Self – pollination**	**(f)**	**Buds**
7.	**Cross pollination**	**(g)**	**Regeneration**
8.	**Wind pollination**	**(h)**	**Root propagation**
9.	**Pollination by insects**	**(i)**	**Anemophily**

10. Pollination by birds (j) Autogamy

Ans :

1	Bryophyllum	f	Buds
2	Strawberry	e	Stem propagation
3	Asparagus	h	Root propagation
4	Agave	b	Bulbils
5	Planaria	g	Regeneration
6	Self–pollination	j	Autogamy
7	Cross pollination	d	Allogamy
8	Wind pollination	i	Anemophily
9	Pollination by insects	c	Entomophily
10	Pollination by birds	a	Ornithophily

2. Sexual Reproduction in Human :

1.	**Acrosome**	**(a)**	**Oogenesis**
2.	**Sperm formation**	**(b)**	**identical twins**
3.	**Egg formation**	**(c)**	**Fraternal twins**
4.	**Onset of puberty**	**(d)**	**Endometrium**
5.	**Ceasing of menstruation**	**(e)**	**Gestation**
6.	**Uterine wall**	**(f)**	**Menopause**
7.	**Pregnancy**	**(g)**	**Menarche**
8.	**Colostrums**	**(h)**	**Hyaluronidase**
9.	**One sperm two eggs**	**(i)**	**Spermatogenesis**
10.	**One sperm one egg**	**(j)**	**Mammary gland**

Ans :

1	Acrosome	h	Hyaluronidase
2	Sperm formation	i	Spermatogenesis
3	Egg formation	a	Oogenesis
4	Onset of puberty	g	Menarche
5	Ceasing of menstruation	f	Menopause
6	Uterine wall	d	Endometrium
7	Pregnancy	e	Gestation
8	Colostrums	j	Mammary gland
9	One sperm two eggs	c	Fraternal twins
10	One sperm one egg	b	Identical twins

Additional – True or false. If it is false give correct statement

1. In vegetative reproduction, young plants are genetically similar to the parent plant.
Ans : True.

2. Production of an offspring by a single parent without the formation and fusion of gametes is called sexual reproduction.
Ans : False. Production of an offspring by a single parent without the formation and fusion of gametes is called **asexual** reproduction.

3. Asexual reproduction involves only mitotic cell divisions and meiosis does not occur.
Ans : True.

4. The ovary contains the ovules and ovules contain sperm.
Ans : False. The ovary contains the ovules and ovules contain **egg**.

5. **The energy for sperm motility is supplied by ATP produced by mitochondria.**
   Ans : True.
6. **During reproductive period (at puberty) the number of primordial follicles in female is around 60,000 to 70,000.**
   Ans : True.
7. **The human ovum is almost free of yolk.**
   Ans : True.
8. **Generally boys attain puberty between the age of 13 to 14 years, while girls reach puberty between 11 to 13 years.**
   Ans : True.
9. **The secretion of both male and female sex hormones are controlled by LH and FSH.**
   Ans : True.
10. **Menstruation is a periodical phenomenon that continues from puberty to menarche.**
    Ans : False. Menstruation is a periodical phenomenon that continues from puberty to **menopause**.
11. **During pregnancy the uterus expands upto 500 times of its normal size.**
    Ans : True.
12. **Sometimes ovaries releases two eggs and each is fertilised by a different sperm, resulting in Identical Twins.**
    Ans : False. Sometimes ovaries releases two eggs and each is fertilised by a different sperm, resulting in **Non-Identical Twins.**
13. **Vasectomy and tubectomy are methods of permanent birth control methods.**
    Ans : True.

Additional – Assertion and Reason (2 Marks)

Direction: In each of the following questions, a statement of Assertion is given and a corresponding statement of Reason is given just below it. Of the statements given below, mark the correct answer as

a) Assertion are true and the reason is a correct explanation of the assertion.
b) Assertion are true and the reason is not a correct explanation of the assertion.
c) The assertion is true but the reason is false.
d) The assertion is false but the reason is true.

1. **Assertion :** Calyx and corolla are non–essential or accessory whorls of the flower.
   Reason : Calyx and corolla do not directly take part in the reproduction.
   Ans : (a) Assertion are true and the reason is a correct explanation of the assertion.
2. **Assertion :** Scrotal sac is located outside of the body.
   Reason : Testes need to be cooler than the temperature inside the body.
   Ans : (a) Assertion are true and the reason is a correct explanation of the assertion.
3. **Assertion :** Sertoli cells produces sperms.
   Reason : Leydigs cells secretes the male sex hormone testosterone.
   Ans : (d) The assertion is false but the reason is true.
4. **Assertion :** The epididymis is a highly coiled tube about 6 meteres long.
   Reason : It provides a temporary storage site for the immature sperms.
   Ans : (a) Assertion are true and the reason is a correct explanation of the assertion.
5. **Assertion :** Fertilization in human is internal.
   Reason : Fertilization occurs in the oviduct of the female genital tract.
   Ans : (a) Assertion are true and the reason is a correct explanation of the assertion.

Additional – Answer in a sentence (1 mark)

1. **Define asexual reproduction.**
   Production of an offspring by a single parent without the formation and fusion of gametes is called asexual reproduction.
2. **Define pollination.**
   The transfer of pollen grains from anther to stigma of a flower is called as pollination.
3. **Define reproduction.**
   The ability of all living organisms to produce more of its own kind to ensure continuity and survival of the species is called reproduction.
4. **What is Diaphragm (cervical cap)?**
   The Diaphragm (cervical cap) is a small, bowl-shaped latex or silicone cup. It is inserted into the vagina and fits snugly over the cervix. This prevents the entry of sperms into the uterus.
5. **What Parturition?**
   Parturition is the expulsion of young one from the mother's uterus at the end of gestation.
6. **What is Lactation?**
   The process of milk production after child birth from mammary glands of the mother is called lactation.
7. **What is umbilical cord?**
   A cord containing blood vessels that connects the placenta with the foetus is called the umbilical cord.
8. **What are the primary and secondary (accessory) sex organs of male?**
   - **Primary organ :** Testes.
   - **Secondary (accessory) organ :** Vas deferens, epididymis, seminal vesicle, prostate gland and penis.
9. **What are the primary and secondary (accessory) sex organs of female?**
   - **Primary organ :** Ovaries.
   - **Secondary (accessory) organ :** Fallopian tubes, uterus, cervix and vagina.
10. **What is cleavage?**
    Cleavage is a series of rapid mitotic divisions of the zygote to form many celled blastula (Blastocyst).
11. **Define regeneration. Give examples.**
    The ability of the lost body parts of an individual organism to give rise to an whole new organism is called regeneration. Eg. Hydra and Planaria

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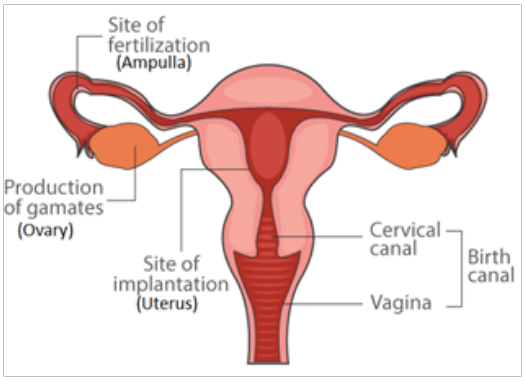
Additional – Short answer questions (2 mark)

1. **With the help of a neat labelled diagram of the female reproductive system, depict the following sites:**
   a) Production of gamete.
   b) Site of fertilization.
   c) Site of implantation.
   d) Birth canal.



2. Differentiate Oogenesis and spermatogenesis.

S.No.	Oogenesis	Spermatogenesis
1	Production of eggs from Oogonia	Production of sperm from Spermatogonia
2	Takes place inside the ovary in females	Takes place inside the testes in males
3	Generates non–motile gametes	Produces motile gametes

3. List the following events observed in human reproduction in chronological order.

Fertilization, gametogenesis, insemination, gestation, parturition, implantation.

Following is the sequence of events occurring in the process of human reproduction:

- Gametogenesis.
- Insemination.
- Fertilization.
- Implantation.
- Gestation.
- Parturition.

4. What are the three types of reproduction in plants?

There are three types of reproduction in plants namely;

- Vegetative,
- Asexual and
- Sexual reproduction**.**

5. What are bulbils?

Bulbils is the modification of vegetative or floral bud. It is swollen due to storage of food. It can function as an organ of vegetative propagation. These bulbils fall on the ground and grow into new plants. eg: Agave.

6. What are the importance of Pollination?

- It results in fertilization which leads to the formation of fruits and seed.
- New varieties of plants are formed through new combination of genes in case of cross pollination.

7. What are the four whorls of a flower?

These whorls are from outside.

- Calyx – consisting of sepals.
- Corolla – consisting of petals.
- Androecium – consisting of stamens.
- Gynoecium or pistil – consisting of carpels.

8. What are the essential and non-essential parts of a flower?

- **Non-essential parts :** The two outermost whorls calyx and corolla are non–essential or accessory whorls as they do not directly take part in the reproduction.
- **Essential parts :** The other two whorls androecium and gynoecium are known as the essential whorls, because both take part directly in reproduction.

9. Describe the characteristic features flowers pollinated water (Hydrophilous) flower.

- Pollen grains are produced in large numbers.
- Pollen grains float on surface of water till they land on the stigma of female flowers e.g. Hydrilla, Vallisneria.

10. Describe the characteristic features of flowers pollinated by insects (Entamophilous).

To attract insects these flowers are brightly coloured, have smell and nectar. The pollen grains are larger in size, the exine is pitted, spiny etc., so they can be adhered firmly on the sticky stigma. Approximately, 80% of the pollination done by the insects is carried by honey bees.

11. Describe the characteristic features of wind-pollinated (Anemophilous) flower

- The anemophilous flowers produce enormous amount of pollen grains.
- The pollen grains are small, smooth, dry and light in weight.
- The stigmas are comparatively large, protruding and sometimes hairy to trap the pollen grains. eg: Grasses and some cacti.

12. What are significance of Fertilization in flowering plants?

- It stimulates the ovary to develop into fruit.
- It helps in development of new characters from two different individuals.

13. Write the post fertilization changes take place in flower.

- The ovule develops into a seed.
- The integuments of the ovule develop into the seed coat.
- The ovary enlarges and develops into a fruit.

14. What are the four phases of menstrual cycle?

The menstrual cycle consists of 4 phases;

- Menstrual or Destructive Phase.
- Follicular or Proliferative Phase.
- Ovulatory Phase.
- Luteal or Secretory Phase.

15. Describe the events leading to when fertilization occurs and does not occur.

- **If fertilization takes place :** The corpus luteum persists, continues to secrete progesterone maintains the thickened state of uterine wall and prevents maturation of another follicle till the end of pregnancy.
- **If fertilization does not occur :** Corpus luteum degenerates, the egg disintegrates and the uterine lining slowly breaks, discharged as blood and mucus leading to menstrual events.

16. Define implantation.

The blastocyst (fertilized egg) reaches the uterus and gets implanted in the uterus. The process of attachment of the blastocyst to the uterine wall (endometrium) is called implantation.

17. What is blastula?

The human embryo at the early stage of development when it is a hollow ball of cells is known as blastula. It is formed as the result of a series of rapid mitotic divisions of the zygote. It comprises an outer layer of smaller cells and inner mass of larger cells.

18. Define Gastrulation.

The transformation of blastula into gastrula and the formation of primary germ layers (ectoderm, mesoderm and endoderm) by rearrangement of the cells is called gastrulation.

19. What is organogenesis?

Organogenesis is the process by which the three germ tissue layers of the embryo, which are the ectoderm, endoderm, and mesoderm, develop into the internal organs of the organism.

20. What is placenta? Mention its function.

The placenta is a disc shaped structure attached to the uterine wall and is a temporary association between the developing embryo and maternal tissues. It allows the exchange of food materials, diffusion of oxygen, excretion of nitrogenous wastes and elimination of carbon dioxide.

21. How are the identical and non-identical twins formed?

- **Non-identical twins :** Sometimes ovaries releases two eggs and each is fertilised by a different sperm, resulting in Non-Identical Twins (Fraternal Twins).
- **Identical twins :** If single egg is fertilised and then divides into two foetus, Identical Twins develop.

22. What are the common contraceptive methods used to prevent pregnancy?

- ✦ Barrier methods.
- ✦ Hormonal methods.
- ✦ Intra-Uterine Devices (IUDs).
- ✦ Surgical methods**.**

23. What are Intra-Uterine Devices (IUDs)?

The intrauterine device (IUD) are contraceptive devices inserted into the uterus. There are two synthetic devices commonly used in India are Lippe's Loop and Copper-T made of copper and plastic (non irritant). This can remain for a period of 3 years. This reduces the sperm fertilizing capacity and prevents implantation.

24. Write the measures which can ensure toilet hygiene.

- ✦ The floors of the toilet should be maintained clean and dry. This helps to reduce the bad odour and also infection.
- ✦ Toilet flush handles, door knobs, faucets, paper towel dispensers, light switches and walls should be cleaned with disinfectants to kill harmful germs and bacteria.
- ✦ Hands should be washed thoroughly with soap before and after toilet use.

25. What is gametogenesis?

The formation of the sperm (Spermatogenesis) in male and the ovum (Oogenesis) in female is called gametogenesis.

Additional – Long answer questions

1. Explain the vegetative reproduction takes place in plants.

In vegetative reproduction, new plantlets are formed from vegetative (somatic) cells, buds or organs (root, stem, leaf or bud) of plant. It has only mitotic division, no gametic fusion and daughter plants are genetically similar to the parent plant.

Vegetative reproduction may take place through;

I. **By vegetative parts**

- ✦ **Leaves :** In Bryophyllum small plants grow at the leaf notches
- ✦ **Stems :** In strawberry aerial weak stems touch the ground and give off adventitious roots and buds. When the connections with the parent plant is broken, the offspring beomes independent.
- ✦ **Root :** Tuberous roots (Asparagus and Sweet potato) can be used for vegetative propagation.
- ✦ **Bulbils :** In some plants the flower bud modifies into globose bulb which are called as bulbils, when these falls on the ground they grow into new plants. e.g. Agave.

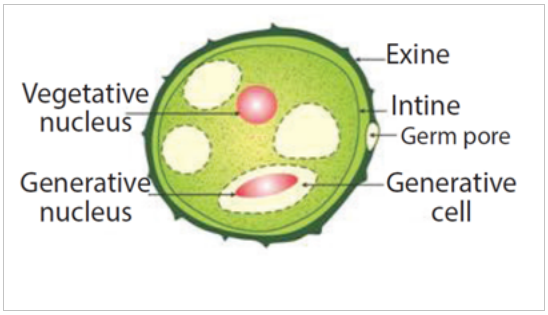
II. **Fragmentation :** In filamentous algae, breaking of the filament into many fragments is called fragmentation. Each fragment having atleast one cell, may give rise to a new filament of the algae by cell division e.g. Spirogyra.

III. **Fission** : In this type the parent cell divides into two daughter cells and each cell develops into a new adult organism e.g. Amoeba.

IV. **Budding**: Formation of a daughter individual from a small projection, the bud, arising on the parent body is called budding. e.g. Yeast.

V. **Regeneration :** The ability of the lost body parts of an individual organism to give rise to an whole new organism is called regeneration. It takes place by specialized mass of cells e.g Hydra and Planaria.

2. With labelled diagram describe the structure of pollen grain.



- Pollen grains are usually spherical in shape.
- It has two layered wall.
- **Exine :** The hard-outer layer is known as exine. It has prominent apertures called germpore.
- **Intine :** The inner thin layer is known as intine. It is a thin and continuous layer made up of cellulose and pectin.
- Mature pollen grains contain two cells, the vegetative and the generative cell.
- Vegetative cell contains a large nucleus.
- The generative cell divides mitotically to form two male gametes.

3. What is self-pollination or autogamy? What are the advantages and disadvantages of self pollination?

The transfer of pollen grains from the anther to the stigma of same flower or another flower borne on the same plant is known as self-pollination or autogamy. e.g. Hibiscus.

Advantages of self-pollination

- Self-pollination is possible in certain bisexual flowers.
- Flowers do not depend on agents for pollination.
- There is no wastage of pollen grains.

Disadvantages of self-pollination

- The seeds are less in numbers.
- The endosperm is minute. Therefore, the seeds produce weak plants.
- New varieties of plants cannot be produced**.**

4. What is Cross pollination or allogamy? What are the advantages and disadvantages of cross pollination?

Cross-pollination is the transfer of pollen from the anthers of a flower to the stigma of a flower on another plant of the same species. E.g. apples, grapes, plum, etc.

Advantages of cross pollination

- The seeds produced as a result of cross pollination, develop and germinate properly and grow into better plants, i.e. cross pollination leads to the production of new varieties.
- More viable seeds are produced.

Disadvantages of cross-pollination

- Pollination may fail due to distance barrier.
- More wastage of pollen grains
- It may introduce some unwanted characters
- Flowers depend on the external agencies for pollination

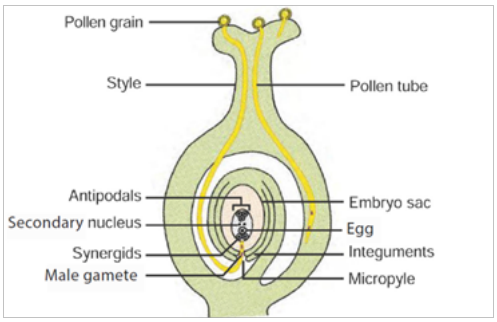
5. Explain the agents of Cross Pollination.

This takes place through the agency of animals, insects, wind and water.

- **Pollination by wind :** The pollination with the help of wind is called anemophily. e.g. Grasses and some cacti.
- **Pollination by insects :** Pollination with the help of insects like honey bees, flies are called entomophily.

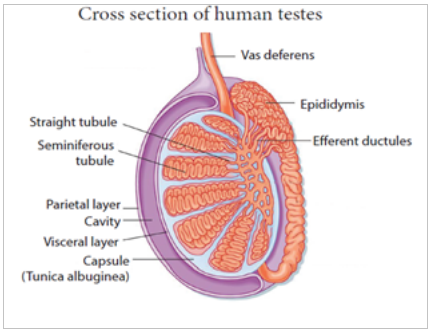
- **Pollination by water :** The pollination with the help of water is called hydrophily.This takes place in aquatic plants. e.g. Hydrilla, Vallisneria.
- **Pollination by Animals :** When pollination takes place with the help of animals, it is called Zoophily.e.g. sun bird pollinates flowers of Canna, Gladioli etc., Squirrels pollinate flowers of silk cotton tree.

6. Explain the process of fertilization of angiospermic plants.



- Pollen grains reach the right stigma and begin to germinate.
- Pollen grain forms a small tube-like structure called pollen tube which emerges through the germ pore. The contents of the pollen grain move into the tube.
- Pollen tube grows through the tissues of the stigma and style and finally reaches the ovule through the micropyle.
- Vegetative cell degenerates and the generative cell divides to form two sperms (or male gametes).
- Tip of pollen tube bursts and the two sperms enter the embryo sac.
- One sperm fuses with the egg (syngamy) and forms a diploid zygote. Sperm (n) + Egg (n) = Zygote (2n)
- The other sperm fuses with the secondary nucleus (Triple fusion) to form the primary endosperm nucleus which is triploid in nature. Second sperm (n) + Secondary nucleus (2n) = Endosperm nucleus (3n)
- Since two types of fusion, syngamy and triple fusion take place in an embryo sac the process is termed as double fertilization.
- After triple fusion, primary endosperm nucleus develops into an endosperm. Endosperm provides food to the developing embryo.
- Later the synergids and antipodal cells degenerate.

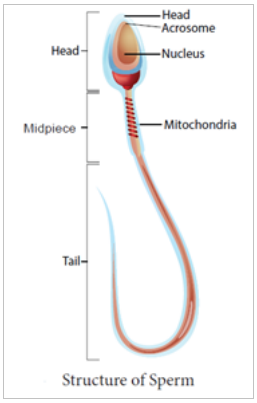
7. Describe the structure of testes with labelled diagram.



- Testes are the reproductive glands of the male that are oval shaped organs which lie outside the abdominal cavity of a man in a sac like structure called scrotum.
- Each testes is covered with a layer of fibrous tissue called tunica albuginea.
- Many septa from this layer divide the testes into pyramidal lobules, in which lie seminiferous tubules, cells of Sertoli, and the Leydig cells (interstitial cells).
- The process of spermatogenesis takes place in the seminiferous tubules.
- The Sertoli cells are the supporting cells and provide nutrients to the developing sperms.

- The Leydig cells are polyhedral in shape and lie between the seminiferous tubules and secrete testosterone. It initiates the process of spermatogenesis.

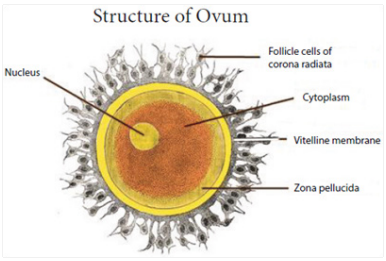
8. Describe the structure of Human Sperm with labelled diagram.



Structure of Sperm

- The spermatozoan consists of head, a middle piece and tail.
- The sperm head is elongated and formed by the condensation of nucleus.
- The anterior portion has a cap structure called acrosome.
- Acrosome contains hyaluronidase an enzyme that helps the sperm to enter the ovum during fertilization.
- A short neck connects the head and middle piece which comprises the centrioles.
- The middle piece contains the mitochondria which provides energy for the movement of tail. It brings about sperm motility which is essential for fertilization.

9. Describe the structure of Ovum with labelled diagram.



i) The mature ovum or egg is spherical in shape.
ii) The ovum is almost free of yolk. It contains abundant cytoplasm and the nucleus.
iii) The plasma membrane of ovum is surrounded by three membranes.
   - Inner thin zona pellucida.
   - Vitelline membrane forms the surface layer of the ovum.
   - An outer thick corona radiata. The corona radiata is formed of follicle cells.
iv) The fluid-filled space between zona pellucida and the surface of the egg is called perivitelline space.

10. Describe different events of human reproduction from fertilization to foetal development.

- **Fertilization :** Fertilization in human is internal and occurs in the oviduct of the female genital tract. The sperm enters into the ovum and fuses with it, resulting in the formation of a 'zygote'. This process is called fertilization. The zygote is a fertilized ovum.
- **Cleavage and Formation of Blastula :** The first cleavage takes place about 30 hours after fertilization. Cleavage is a series of rapid mitotic divisions of the zygote to form many celled blastula (Blastocyst) which comprises an outer layer of smaller cells and inner mass of larger cells.
- **Implantation :** The blastocyst (fertilized egg) reaches the uterus and gets implanted in the uterus. The process of attachment of the blastocyst to the uterine wall (endometrium) is called implantation. The fertilized egg becomes implanted in about 6 to 7 days after fertilization.
- **Gastrulation :** The transformation of blastula into gastrula and the formation of primary germ layers

(ectoderm, mesoderm and endoderm) by rearrangement of the cells is called gastrulation. This takes place after the process of implantation.

- **Organogenesis :** The establishment of the germ layers namely ectoderm, mesoderm and endoderm initiates the final phase of embryonic development. During organogenesis the various organs of the foetus are established from the different germ layers attaining a functional state.
- **Formation of Placenta :** The placenta is a disc shaped structure attached to the uterine wall and is a temporary association between the developing embryo and maternal tissues. It allows the exchange of food materials, diffusion of oxygen, excretion of nitrogenous wastes and elimination of carbon dioxide. A cord containing blood vessels that connects the placenta with the foetus is called the umbilical cord.
- **Pregnancy (Gestation) :** It is the time period during which the embryo attains its development in the uterus. Normally gestation period of human last for about 280 days. During pregnancy the uterus expands upto 500 times of its normal size.
- **Parturition (Child Birth) :** Parturition is the expulsion of young one from the mother's uterus at the end of gestation. Oxytocin from the posterior pituitary stimulates the uterine contractions and provides force to expel the baby from the uterus, causing birth.

11. What is UTI ? Explain its types.

A urinary tract infection (UTI) is an infection in any part of our urinary system — our kidneys, ureters, bladder and urethra. Woman are susceptible to UTI from the bacteria that are present on skin, rectum or vagina.

The types of UTI are:

- **Cystitis or Bladder infection :** Bacteria lodged in the urinary bladder thrive and multiply leading to inflammation. It is most common in the age group of 20 to 50.
- **Kidney Infection :** The bacteria can travel from the urinary bladder and upward to ureter and affect one or both the kidneys. It also infects the blood stream and leads to serious life-threatening complications.
- **Asymptomatic Bacteriuria :** The bacteria present in the urinary bladder which may not show any symptoms.

Important Abbreviations to remember

LH	Luteinizing Hormone
FSH	Follicle Stimulating Hormone
RCH	Reproductive and Child Health Care
STD	Sexually Transmitted Diseases
IUD	Intra–Uterine Infection
UNICEF	United Nations International Children's Emergency Fund
WHO	World Health Organisation

UNIT TEST - 17

Time : 1.15 Hrs. Marks : 50

I. Choose the best answer (5 × 1 = 5)

1. **Anemophilous flowers have _____.**
   a) Sessile stigma b) Small smooth stigma c) Colored flower d) Large feathery stigma
2. **The plant which propagates with the help of its leaves is _____.**
   a) Onion b) Neem c) Ginger d) Bryophyllum
3. **A single highly coiled tube where sperms are stored, get concentrated and mature is known as**
   a) Epididymis b) Vasa efferentia c) Vas deferens d) Seminiferous tubules

4. **The cell division takes place during vegetative reproduction is _____.**
   a) Amitosis b) Mitosis c) Meiosis d) None of the above
5. **Which of the following produces the male sex hormone?**
   a) Rete testis b) Seminiferous tubule c) Leydig cell d) Scrotum

II. Fill in the blanks

(5 × 1 = 5)

6. Planaria reproduces asexually by _____.
7. Prolactin is a hormone produced by _____.
8. The implantation of the embryo occurs at about _____ day of fertilization.
9. In Agave, the flower bud modifies into globose bulb which are called as _____.
10. Each testes is covered with a layer of fibrous tissue called _____.

III. State whether the statements are true or false. Correct the false statement

(5 × 1 = 5)

11. Stalk of the ovule is called pedicle.
12. Menstrual cycle ceases during pregnancy.
13. The increased level of estrogen and progesterone is responsible for menstruation.
14. Sometimes ovaries releases two eggs and each is fertilised by a different sperm, resulting in identical twins.
15. Production of an offspring by a single parent without the formation and fusion of gametes is called sexual reproduction.

IV. Match the following

(5 × 1 = 5)

16.	Fission	(a)	Spirogyra
17.	Budding	(b)	Planaria
18.	Fragmentation	(c)	Yeast
19.	Agave	(d)	Bulbils
20.	Regeneration	(e)	Amoeba

V. Assertion and Reasoning

(5 × 1 = 5)

Direction: In each of the following questions, a statement of Assertion is given and a corresponding statement of Reason is given just below it. Of the statements given below, mark the correct answer as

a. If both A and R are true and R is the correct explanation of A.
b. If both A and R are true but R is not the correct explanation of A.
c. If A is true but R is false.
d. If both A and R are false.

21. **Assertion:** Calyx and corolla are non–essential or accessory whorls of the flower.
    Reason: Calyx and corolla do not directly take part in the reproduction.
22. **Assertion:** Scrotal sac is located outside of the body.
    Reason: Testes need to be cooler than the temperature inside the body.
23. **Assertion:** Sertoli cells produces sperms.
    Reason: Leydigs cells secretes the male sex hormone testosterone.
24. **Assertion:** The epididymis is a highly coiled tube about 6 meteres long.
    Reason: It provides a temporary storage site for the immature sperms.

25. **Assertion:** Fertilization in human is internal.

    Reason: Fertilization occurs in the oviduct of the female genital tract.

VI. Write the answer for the following questions in word or sentence

(5 × 1 = 5)

26. In which part of the flower germination of pollen grains takes place?
27. What is the enzyme present in acrosome of sperm?
28. When is World Menstrual Hygiene Day observed?
29. What is the need for contraception?
30. Mention the function of endosperm.

VII. Write the short answer for ANY 5 of the following questions

(6 × 2 = 12)

31. How does binary fission differ from multiple fission?
32. Why is vegetative propagation practiced for growing some type of plants?
33. Why are the human testes located outside the abdominal cavity? Name the pouch in which they are present.
34. How does developing embryo gets its nourishment inside the mother's body?
35. Name the secondary sex organs in male.
36. What is colostrum? How is milk production hormonally regulated?
37. Differentiate Oogenesis and spermatogenesis.

VIII. Write long answer for the following questions

(2 × 5 = 10)

38. a) Write the events involved in the sexual reproduction of a flowering plant.
    b) Discuss the first event and write the types.
    c) Mention the advantages and the disadvantages of that event.

    or

    With neat labelled diagram describe the parts of typical angiospermic ovule.

39. What are the phases of menstrual cycle? Indicate the changes in the ovary and uterus.

    or

    Describe the structure of human sperm with labelled diagram.

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