# 3 LIFE PROCESSES – REPRODUCTION, GROWTH AND DEVELOPMENT

**I. Multiple choice questions: Tick (✓) the correct choice.**

**1.** The common method of reproduction in bacteria is
(a) budding (b) fragmentation
(c) binary fission (d) all the above

**Ans.** (c)

**2.** Budding is commonly seen in
(a) yeast (b) grasses (c) *Amoeba* (d) *Spirogyra*

**Ans.** (a)

**3.** Reproduction or propagation by stem is common in
(a) rose (b) potato (c) sweet potato (d) *Bryophyllum*

**Ans.** (b)

**4.** Unisexual flowers are found in
(a) mulberry (b) mustard (c) pea (d) sunflower

**Ans.** (a)

**5.** A seed consists of
(a) embryo (b) seed coat and cotyledons
(c) embryo and seed coat (d) seed coat and endosperm

**Ans.** (c)

**6.** An embryo of a seed consists of
(a) plumule (b) radicle, plumule and cotyledons
(c) plumule and radicle (d) radicle and cotyledons

**Ans.** (b)

**7.** Conditions necessary for seed germination are
(a) water, oxygen and suitable temperature
(b) water and oxygen
(c) water and suitable temperature
(d) water, oxygen and enzymes

**Ans.** (a)

**8.** Testes are present in a sac called?
(a) scrotum (b) oviduct (c) epididymis (d) none

**Ans.** (a)

**9.** Butterfly in its development from larva to an adult shows
(a) multiplication (b) metamorphosis
(c) fertilisation (d) none of the above
**Ans.** (b)

**10.** Which of the following glands is responsible for bringing about changes during adolescence in boys and girls?
(a) Pituitary (b) Adrenal (c) Thyroid (d) Testis
**Ans.** (a)

**11.** A gram seed is
(a) endospermic (b) non-endospermic
(c) dicotyledonous (d) (b) and (c)
**Ans.** (c)

**12.** In epigeal germination cotyledon is lifted above the soil which is due to the growth of
(a) endosperm (b) epicotyle (c) leaf (d) hypocotyle
**Ans.** (d)

**13.** Following is a monocot seed without endosperm:
(a) castor (b) maize (c) pea (d) orchid
**Ans.** (d)

**14.** Which of the following is not needed for the germination of seeds:
(a) Moisture (b) Suitable temperature
(c) Soil (d) Oxygen
**Ans.** (c)

**15.** Following contain digestive enzymes for the digestion of endosperm
(a) scutellum (b) seed coat (c) pericarp (d) aleurone layer
**Ans.** (d)

**16.** Removal of male part of a flower is called
(a) pollination (b) fertilizaton
(c) emasculation (d) breeding
**Ans.** (c)

**17.** A flower is a
(a) special organ (b) branch system
(c) modified shoot meant for reproduction
(d) none
**Ans.** (c)

**18.** Spirogyra can reproduce asexually by
(a) fragmentation (b) fusion of gametangia
(c) fission (d) budding
**Ans.** (a)

**19.** The male reproductive part of a flower is called
(a) calyx (b) corolla (c) stamens (d) inflorescence
**Ans.** (c)

**20.** The transfer of pollen grains from anther to stigma of a pistil is called
(a) fertilization (b) pollination (c) germination (d) grafting
**Ans.** (b)

**21.** Salvia is an example of
(a) insect-pollinated flower (b) wind-pollinated flower
(c) water-pollinated flower (d) self-pollinated flower
**Ans.** (a)

**22.** Bryophyllum reproduces vegetatively by means of
(a) stolon (b) bulbil (c) adventitious buds (d) rhizome
**Ans.** (c)

**23.** Adolescence age for girls is
(a) 18 years (b) 21 years (c) 13 years (d) 15 years
**Ans.** (c)

**24.** Puberty is the period of sexual maturity. In males it can be characterised by
(a) appearance of beard (b) change of voice
(c) change in height (d) all the above
**Ans.** (d)

**25.** Which gland does become very active during adolescence?
(a) Digestive gland (b) Sweat gland
(c) Pituitary gland (d) Pancreas
**Ans.** (c)

**26.** Amoeba is a unicellular animal belonging to the Phylum
(a) protozoa (b) annelida (c) coelenterate (d) arthropoda
**Ans.** (a)

**27.** When condition is unfavourable, amoeba reproduces by
(a) binary fission (b) budding
(c) encystment (d) fragmentation
**Ans.** (c)

**28.** Hydra reproduces asexually by a process called
(a) fertilization (b) budding
(c) binary fission (d) encystment
**Ans.** (b)

**29.** The reproductive organ of a woman is
(a) testes (b) ovaries (c) ovum (d) uterus
**Ans.** (b)

**30.** The cord which connects the mother and the child in uterus is
(a) placenta (b) yolk (c) umbilical cord (d) arteries
**Ans.** (c)

**31.** The life cycle of butterfly exhibits
(a) no metamorphosis (b) complete metamorphosis
(c) partial metamorphosis (d) double metamorphosis
**Ans.** (b)

**32.** During metamorphosis
(a) egg changes into pupa (b) larva changes into pupa
(c) egg changes into adult (d) larva changes into adult
**Ans.** (c)

**33.** An adult butterfly lacks
(a) powerful jaws (b) antenna (c) wings (d) sex organs
**Ans.** (a)

**34.** Caterpillar does not posses
(a) tubular probosis (b) prolegs
(c) ocelli (d) spinnerates
**Ans.** (a)

**35.** Larvae of butterfly cannot
(a) eat (b) reproduce (c) walk (d) respire

**Ans.** (b)

**36.** Larvae of butterfly has
(a) 7 pairs of legs (b) 6 pairs of oceili
(c) trachea for respiration (d) all the above

**Ans.** (a)

**37.** Inside a cocoon
(a) pupa takes rest (b) pupa dies
(c) changes into adult (d) lays eggs

**Ans.** (a)

**38.** The number of organisms produced by binary fission are
(a) two (b) three (c) four (d) innumerable

**Ans.** (a)

**39.** Which of these can be reproduced by its stem?
(a) Carrot (b) *Bryophyllum* (c) Rose (d) Papaya

**Ans.** (c)

**40.** An incomplete flower with only androecium is called a
(a) hermaphrodite flower (b) pistillate flower
(c) bisexual flower (d) staminate flower

**Ans.** (b)

**II. Match the items of column I with the items of column II:**

| *Column I* | *Column II* |
|---|---|
| **1.** Albumen | **(a)** Stem |
| **2.** Scutellum | **(b)** Protect radicle |
| **3.** Seed coat | **(c)** Cotyledon |
| **4.** Coleorrhiza | **(d)** Endosperm |
| **5.** Plumule | **(e)** Testa |
| **6.** Pericarp | **(f)** Fruit |

**Ans. 1.** (d) **2.** (c) **3.** (e) **4.** (b) **5.** (a) **6.** (f).

## III. Fill in the blanks.

1. Budding is a kind of ..... reproduction.
2. The amount of cytoplasm in the parent cell is ..... than the amount in the bud.
3. Yeast cells reproduce by ..... .
4. *Amoeba* reproduces by ..... .
5. Binary fission produces cells of ..... size.
6. Budding produces cells of ..... size.
7. Fungi, ferns and mosses reproduce by ..... .
8. Male sex cells in plants are called ..... .
9. The two kinds of pollination are ..... and ..... .
10. In bean seed, germination is ..... .
11. Three conditions necessary for seed germination are ..... , ..... and ..... .
12. A bean seed when soaked in water mainly absorbs water through ..... .
13. A seed buried deep in soil does not germinate due to ..... .
14. In maize grain, food is in the form of ..... stored in endosperm.
15. The inner papery seed coat is known as ..... .
16. Pea seed exhibits ..... germination.
17. ..... is an example of true fruit.
18. ..... is an example of false fruit.
19. ..... fruits and seeds are carried away by animals.
20. ..... are produced in whorls at the base of inflorescence.
21. Pollination is brought about by ..... , ..... , ..... , ..... .
22. Fruit is a ..... ovary.
23. Seed is a ..... ovule.
24. ..... fruit develops from the ovary after fertilization.
25. Hydra is a ..... organism.

**26.** The binary fission means division of an individual into two ..... individuals.
**27.** Testes produce ..... while ovaries produce ..... .
**28.** All living things reproduce in order to maintain the ..... of the species.
**29.** The embryo obtains oxygen and food from the ..... .
**30.** Butterflies are ..... .
**31.** In the complete metamorphosis, the various stages are egg, ..... adult.
**32.** Butterflies have ..... antennae.
**33.** Butterflies have ..... pairs of joint legs.
**34.** ..... is the larval stage of a butterfly.
**35.** In females, the ..... bones grow and ..... widen during adolescence.
**36.** In males, ..... grows as a sign of adolescence.
**37.** At the age of ..... , full development of the brain takes place.
**38.** ..... , ..... and ..... are the developments of an adolescent.
**39.** The small outgrowth arising from the yeast cell is called a ..... .
**40.** Under unfavourable conditions certain organisms develop a ..... for protection.

**Ans.** **1.** Asexual **2.** More **3.** Budding **4.** Binary fission **5.** Equal **6.** Unequal **7.** Spores **8.** Pollen grains **9.** Self-pollination, Cross-pollination **10.** Epigeal **11.** Water, Oxygen, Suitable temperature **12.** Micropyle **13.** Absence of oxygen **14.** Starch and protein **15.** Tegmen **16.** Epigeal **17.** Mango **18.** Apple **19.** Edible **20.** Calyx **21.** Insect, Wind, Water, Bird **22.** ripened **23.** Fertilized **24.** True **25.** Multi-cellular **26.** Identical **27.** Sperms, Ovum **28.** Identity **29.** Blood vessels in the umbilical cord **30.** Insects **31.** Larva, Pupa **32.** Clubbed **33.** Three pairs **34.** Caterpillar **35.** Pelvic, Breast **36.** Beards and moustaches **37.** 15-18 **38.** Change in physique, change in voice, muscular development **39.** Bud **40.** Cyst.

**IV. Fill in the blanks by selecting suitable words:**

(unisexual, fertilization, fruit, stamen, anther, bisexual, pollination, seed, ovary)

1. A flower that bears both the male and the female parts is know as ..... flower.
2. A flower bearing only male or female parts is known as ..... flower.
3. Transfer of pollen grains from the anther to the stigma is known as ..... .
4. Fusion of male cell with the female cell is called ..... .
5. The ovule develops into a ..... .

**Ans.** **1.** bisexual **2.** unisexual **3.** pollination **4.** fertilization **5.** seed.

**V. Which of the following statements are true (T) and which ones are false (F)? Mark T or F:**

1. Asexual reproduction is more common than the sexual reproduction.
2. Producing life is called respiration.
3. Dogs and cats reproduce from two parents.
4. Bacteria, yeast and amoeba reproduce by sexual reproduction.
5. Reproduction by spores is a method of asexual reproduction.
6. A potato tuber is really an underground stem.
7. A whole new plant can grow from the eye of a tuber.
8. Cutting and grafting are natural means for reproduction.
9. Most organisms have the capacity of regeneration in some or the other way.
10. Stamens make egg cells.
11. A fertilised egg becomes of seed.
12. Flowers which possess stamens and carpel are called unisexual.
13. Insect-pollinated flowers are brightly coloured.
14. Wind-pollinated flowers produce pollen grains in large quantity.
15. Endosperm is present in bean seeds.
16. The plumule of an embryo gives use to the root system.

**17.** Some seeds have no cotyledons at all.
**18.** Maize grain is a fruit and not a seed.
**19.** Oxygen is necessary for the germination of seeds.
**20.** Hilum allows entry of water.
**21.** Unsoaked seeds placed on dry cotton germinate.
**22.** Fruit is a ripened ovary.
**23.** True fruit develops from the ovary after fertilization.
**24.** Carples are collectively called as gynoecium and are the female parts of the flower.
**25.** The union of two special cells, the gametes, is known as fertilization.
**26.** Amoeba is an immortal animal.
**27.** Hydra reproduces asexually by binary fission.
**28.** Testes produce sperms called semen.
**29.** The human reproductive organs in male are known as ovaries.
**30.** The embryo develops within the uterus of the mother.

**Ans.** **1.** T **2.** F **3.** T **4.** F **5.** T **6.** T **7.** T **8.** F **9.** T **10.** F **11.** T **12.** F **13.** T **14.** T **15.** F **16.** F **17.** F **18.** T **19.** T **20.** F **21.** F **22.** T **23.** T **24.** T **25.** T **26.** T **27.** F **28.** T **29.** F **30.** T

**VI. Find the odd one out, giving reasons:**

**1.** Gamete, budding, fragmentation, regeneration.

**Ans.** **Gamete.** Budding, fragmentation and regeneration are the methods of asexual reproduction while gametes are meant for sexual reproduction.

**2.** Cutting, grafting, layering, binary fission.

**Ans.** **Binary fission.** Cutting, grafting and layering are the artificial methods of asexual reproduction in plants while binary fission is natural method of asexual reproduction in microorganisms.

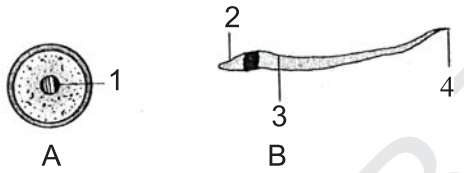
**3.** Ovary, stigma, style, pollen grain.

**Ans.** **Pollen grain.** Stigma, style and ovary are the parts of female reproductive organ while pollen grain is the part of male reproductive organ.

**4.** Testes, epididymis, vas deferens, uterus.

**Ans.** **Uterus.** Testes, epididymis and vas deferens are the parts of male reproductive organs while uterus is the part of female reproductive organs.

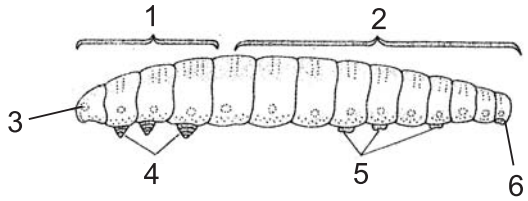
**VII. The figure below shows two reproductive cells:**




(i) Identify A and B.
(ii) Label the parts 1, 2, 3, 4.
(iii) When is 'B' produced?
(iv) What happens when A and B fuse:
Product : _____ Process : _____

**Ans.** (i) (A) Ovum (B) Sperm
(ii) (1) Nucleus (2) Head (3) Neck (4) Tail
(iii) Sperms are produced at the age of puberty. It is male reproductive cell.
(iv) The process of the fusion of sperm and ovum is called fertilization. After fertilisation the young embryo passes down into the uterus.

**VIII. The following figures shows the lateral view of larva of a butterfly:**



(i) Label the parts marked 1, 2, 3, 4 & 5.

**Ans. Labelling of parts marked as 1, 2, 3, 4, 5 & 6.**

(i) (1) Thorax (2) Abdomen (3) Head (4) True legs (5) Prolegs (6) Clasper

(ii) State the function of the part marked as 4.

**Ans. Function of the part marked as 4.**

These are true legs which help in crawling.

**IX. Name the following:**

**1.** Part of the flower where ovule is formed.

**Ans.** Female reproductive part, carpel is present in the centre of a flower. It consists of stigma, style, and ovary. Ovary contains ovules.

**2.** Three agents of pollination.

**Ans.** Wind, water and insects are the agents of pollination.

**3.** The place where fertilisation occurs in a flowering plant.

**Ans.** Fertilization occurs in ovary with a female gamete inside an ovule.

**4.** Organism showing multiple fission.

**Ans.** Amoeba shows multiple fission.

**5.** An animal showing metamorphosis.

**Ans.** Butterfly shows metamorphosis.

**X. Give one example of each.**

(i) Rhizomes — (ii) Tubers — (iii) Bulbs —

(iv) Runners — (v) Stolons — (vi) Bulbils —

**Ans.** (i) Rhizomes — Ginger (ii) Tubers — Potato

(iii) Bulbs — Onion (iv) Runners — Common grass (*doob*)

(v) Stolons — Wild strawberry

(vi) Bulbils — Pineapple

**XI. Name the following:**

(i) A seed which shows hypogeal germination.

(ii) A monocot seed.

(iii) A dicot seed.

**Ans.** (i) Maize shows hypogeal germination
(ii) Maize seed (iii) Gram seed

**XII. Mention the common method of reproduction in the following organisms:**

| | | | |
|---|---|---|---|
| **1.** Bacteria | **2.** Yeast | **3.** Spirogyra | **4.** Mucor |
| **5.** Mosses | **6.** Ferns | **7.** Dahlia | **8.** Potato |
| **9.** Ginger | **10.** Gladiolus | **11.** Strawberry | **12.** Rose |
| **13.** Jasmine | **14.** Mango | **15.** *Bougainvillea* | **16.** *Amoeba* |
| **17.** *Hydra* | **18.** Flatworm | | |

**Ans.**

| **Organism** | | **Common method of reproduction** |
|---|---|---|
| **1.** Bacteria | : | By Binary fission |
| **2.** Yeast | : | By Budding |
| **3.** Spirogyra | : | By Fragmentation |
| **4.** Mucor | : | By spores |
| **5.** Mosses | : | By spores |
| **6.** Ferns | : | By spores |
| **7.** Dahlia | : | Propagation by root |
| **8.** Potato | : | Propagation by stem |
| **9.** Ginger | : | By underground stem (Rhizome) |
| **10.** Gladiolus | : | Propagation by stem (Corm) |

**XIII. Mention the functions of the following:**

| | | | |
|---|---|---|---|
| **1.** Flower | **2.** Ovary | **3.** Anther | **4.** Stigma |
| **5.** Seeds | **6.** Testis | **7.** Ovary | **8.** Uterus |
| **9.** Oviduct | **10.** Radicle | | |

**Ans.** **1. Flower.** Flower is the structure in flowering plants that bears the organs for sexual reproduction.

**2. Ovary.** Ovary is the reproductive organ in which ovules are produced.

**3. Anther.** Anther produce numerous pollen grains.

**4. Stigma.** Stigma is the uppermost part of carpel female sex organs. It produces some sticky substances on which pollen grains stick during pollination.

5. **Seeds.** The seed contains the embryo and nutritive tissue either as endosperm or food stored in the cotyledons.
6. **Testis.** Testis is male reproductive and produce sperms organ male gamete. It also produces male sex hormone testosterone.
7. **Ovary.** Ovary is female reproductive organ and produce egg (ova). It also produces female sex hormone (oestrogen).
8. **Uterus.** Uterus is the organ of female mammals in which embryo develops.
9. **Oviduct.** It is a tube-like structure that conveys an animal egg cell from the ovary to other parts of the reproductive system.
10. **Radicle.** It is the part of plant embryo that develops into the root system.

**XIV. Answer the following Questions.**

**1.** Why is reproduction necessary for living organsm?

**Ans.** Reproduction is necessary for living organism because it maintains the genetic continuity among a species and it allows to increase in the total numbers of a species.

Reproduction means to produce young ones of their own kind. It is one of the most important properties of living organism.

For example, a dog produces puppy which grows into adult dog. In plants, seeds also grow into young seedlings. The seedlings in due course of time develop into mature plants as in neem tree.

**2.** Describe the advantages of vegetative reproduction?

**Ans.** Vegetative reproduction has following advantages:

(i) It is an easier method. It is a less expensive and less time consuming process.
(ii) Seedless plants can be produced by this method.
(iii) Plants produced by this method have same characters as parent plants.
(iv) The plants which do not produce viable seeds can grow by this method e.g., banana, sugarcane etc.

**3.** Can a unisexual flower be self-pollinated?

**Ans.** Yes, a unisexual flower should be self-pollinated. Self-pollination means pollination within the same flower or between flowers of the same plant.

**4.** What are the male and female gametes in a flowering plant?

**Ans.** In a flowering plant, male gamete is pollen grain with a nucleus and female gamete is ovule in ovary.

**5.** What part is played by stamens and carpels in reproduction?

**Ans.** Stamens and carpels are the male and female reproductive organs in flowering plants. Stamens produce male gametes (pollen grains) and carpels produce female gamete (ovule).

**6.** Write a brief note on artificial pollination?

**Ans.** Artificial pollination means transfer of pollen grains artificially from one flower to another flower.

The purpose of artifical pollination is to take desired qualities of two different varieties and produce plants with good characters.

**Procedure.** In the process of artificial pollination, take flowers with desired features. Now carefully remove the pollen grains from ripe anther and dusted it on the stigma of another flower. Cover this pollinated flower with polythene bags till fruits and seeds are produced. Covering of flower with polythene is to prevent pollination from other agents. The seeds produced by this flower are sown in next season to produce offsprings with better features.

**7.** Which part of the human body produces (i) Sperms (ii) Ova?

**Ans.** (i) A pair of testes in scrotal sac produce sperms.
(ii) A pair of ovaries produce ova.

**8.** Name the organ involved in the following:
(i) Fertilisation of ovum by the sperm.
(ii) Passing of sperms from a man to a woman.

**Ans.** (i) Fertilisation takes place inside the female's body in the oviduct.
(ii) Penis is used for passing sperms inside the body of the female.

**9.** Mention the conditions necessary for germination.

**Ans.** **Conditions necessary for germination.** For the germination of seeds we require some essential conditions:

(i) **Water:** It is necessary because some vital processes occur by water.

(ii) **Temperature:** An optimum temperature (25–40°C) is required for seed to germinate.

(iii) **Oxygen (air):** For respiration, oxygen is required that provide energy of seed germination.

**10.** Name the two types of seed germination.

**Ans.** Seed germination is of two types:

(i) Epigeal germination. (ii) Hypogeal germination.

(i) **Epigeal germination.** During seed germination, when cotyledons come out of soil, it is called epigeal germination. It occurs due to the elongation of hypocotyle. Epigeal germination is seen in many dicot seeds like bean, castor, sunflower etc.

(ii) **Hypogeal germination.** During seed germination, when cotyledons remain in the soil, it is called hypogeal germination. It is seen in many seeds like maize, gram, pea etc.

**11.** Describe the male and female reproductive system in human beings.

**Ans.** **Male reproductive system.** A male reproductive system has following organs:

(a) **Testis:** A pair of testes are present in scrotal sac that produce male gametes or sperms.

(b) **Epididymis:** A long coiled tube in which sperms are stored.

(c) **Vas deferens:** A pair of ducts carrying sperms from testes to outside through urethra.

(d) **Penis:** Male reproductive organ, used for injecting sperms inside the body of female.

**Female reproductive system.** A female reproductive system has following organs:

(a) **Ovary.** A pair of ovaries are present that produce female gametes or ova.
(b) **Fallopian tube.** A tube that carries egg cells from the ovary to the womb.
(c) **Uterus.** Embryo develops in the uterus.
(d) **Vagina.** It is a tube which leads from uterus to the outside. Sperms are deposited in the vagina during copulation.

**12.** What is a seed?

**Ans.** A seed is a structure that develops from ovule after fertilisation. A seed has an embryo plant which is surrounded by a protective coat and supply a source of food called endosperm. The plant embryo contains a radicle, a plumule and embryonic leaves called cotyledons.

**13.** How would you distinguish between monocot seeds and dicot seeds?

**Ans.** Take two seeds and germinate them. After some time we will see that monocot seed shows hypogeal germination and dicot seed shows epigeal germination.

**14.** In what type of germination, cotyledons are carried above the surface of soil.

**Ans.** In epigeal type of germination, cotyledons are carried above the surface of soil. Epigeal germination is seen in many dicot seeds like bean, castor, and sunflower.

**15.** What is the name given to the outer covering of the seeds?

**Ans.** The hard outer covering of seed is called testa.

**16.** Give an example of hypogeal germination.

**Ans.** In monocots like maize, hypogeal germination takes place.

**17.** What is the difference between embryo and seed?

**Ans.** A seed contains an embryo with seed coat and also supplied with a source of stored food.

An embryo protected by seed coat contains a radicle, a plumule, and embryonic leaves.

**18.** What is meant by vegetative propagation?

**Ans.** It involves the propagation of plants by the parts other than seeds. For example, roots, stem, leaves are used for vegetative

propagation. In this method, no other reproductive organs are used for propagation.

**19.** How does vegetative propagation differ from sexual reproduction?

**Ans.** Vegetative propagation means propagation of plants by the parts other than seeds. It involves only one plant as a parent. Sexual reproduction means development of plant by seed. It involves two plants as parents.

**20.** Distinguish between pollination and fertilisation?

**Ans.** **Pollination.** Pollination means transfer of pollen grains from an anther to stigma of a plant.

**Fertilisation.** The union of male and female gametes in the process of sexual reproduction due to which a unicellular structure called zygote is formed, is called fertilisation.

**21.** State two differences between insect-pollinated flowers and wind-pollinated flowers.

**Ans.** Insect-pollinated flowers are brightly coloured so that they can interact insects. They produce rough, spiny and sticky pollen grains that easily stick on the hairy parts of visiting insects.

Wind-pollinated flowers are small and rarely coloured. They produce smooth-surfaced pollen grains in abundance.

**22.** Mention two ways in which cross-pollination is advantageous than self-pollination.

**Ans.** (1) In cross-pollination, offsprings are healthier.

(2) New varieties are produced by cross-pollination because it involves two varieties for pollination.

**23.** What is the importance of hybrid vigour?

**Ans.** The plants produced by the cross of different varieties are often stronger and produce better yields than the original varieties.

**24.** How is fertilization brought about in a flower?

**Ans.** In plants, fertilization is followed by pollination. By different agents pollen grains are transferred to the stigma. These pollen grains absorb nutrients secreted by the stigma and the cytoplasm in the grain grows out as a tube. This tube grows to ovary through style and enters into the ovule. The tip of the

pollen tube breaks open in the ovule, and the male nucleus enters the ovule and fuses with the female nucleus. This process of the union of male and female nucleus is called fertilisation.

**25.** Distinguish between:
(a) Self-pollination & Cross-pollination
(b) Binary fission & budding

**Ans.** **(a)**

| | **Self-pollination** | **Cross-pollination** |
|---|---|---|
| (1) | It occurs in the same flower. | (1) It occurs in the different flowers either in some or different plants. |
| (2) | It requires little production of pollen grains. | (2) It requires more production of pollen grains. |
| (3) | Varieties produced by self-pollination are weak. | (3) Varieties produced by cross-pollination are strong. |
| (4) | It does not require pollinating agents. | (4) It requires some pollinating agents for pollination. |

**(b)**

| | **Binary fission** | **Budding** |
|---|---|---|
| (1) | In binary fission, organism divides into two equal-sized cells after developing a transverse wall. | (1) In budding, a small out-growth (bud) appears on the parent cell. This bud develops into a new organism. |
| (2) | After binary fission equal-sized cells are formed. | (2) In budding, an organism with small size is formed. |
| (3) | It occurs mostly in bacterial cell. | (3) It occurs in yeast cell. |

**26.** Comment: 'Amoeba is immortal'.

**Ans.** There is no question of life or death to cell contents of Amoeba. Life means functioning of the organism as the whole. As Amoeba divides, the cell contents are equally distributed to

the two daughter cells. In the first generation, the daughter cell receives half the cell content from the mother cell. In the second generation, it receives only one-fourth of the grandmother cell. For every division, the content is divided into half and this goes on for ever. So we can say Amoeba is immortal.

**27.** What is binary fission?

**Ans.** In favourable conditions, some unicellular organisms like bacteria and amoeba reproduce by this method.

In this method, firstly nucleus divides into two, then cytoplasm with a small divided nucleus in each part. These two cells separated by transverse binary fission. Thus, two daughter cells are formed from the original one. These two daughter cells act as new individuals.

**28.** How does hydra reproduce?

**Ans.** Hydra reproduce mainly asexually by budding.

**29.** Why is hydra called a hermaphrodite organism?

**Ans.** Hydra is a hermaphrodite organism because both male and female reproductive organs are present in the same organism.

**30.** When does an amoeba form a cyst?

**Ans.** In unfavourable conditions like high temperature or scarcity of food. Amoeba ceases to perform activities like feeding and locomotion. It secretes a hard cyst wall around itself and undergoes a resting phase.

**31.** What are the differences between a sperm and an ovum?

**Ans.** Difference between a sperm and an ovum.

| | **Sperm** | | **Ovum** |
|---|---|---|---|
| (1) | It is male reproductive cell. | (1) | It is female reproductive cell. |
| (2) | It is produced by testes. | (2) | It is produced by ovaries. |
| (3) | Testes produce a large number of sperms at one time. | (3) | Ovaries produce one ovum at one time. |
| (4) | A sperm is made of head, neck and tail. | (4) | An ovum is made of nucleus and cytoplasm. |

**32.** Where does human embryo develop?

**Ans.** After fertilization, human embryo passes down into the uterus, where it grows into a baby.

**33.** What is umbilical cord?

**Ans.** The cord that connects the embryo to the placenta in the mammal is called umbilical cord. Blood vessels in the umbilical cord bring oxygen and food to the growing embryo and take away other metabolic wastes.

**34.** What is the function of placenta?

**Ans.** Placenta is the connection between embryo and uterus. It can pass oxygen and nutrients between the blood of embryo and its mother.

**35.** What is the meaning of metamorphosis?

**Ans.** The rapid transformation from the larval to a sexually mature adult is called metamorphosis. It occurs in many invertebrates and amphibians.

**36.** State two features of larva of butterfly.

**Ans.** Larva of butterfly (caterpillar) has following features:

(1) It has seven pairs of legs, three pairs of jointed legs at the anterior end and four pairs of suckers like prolegs at the posterior end of the body.

(2) The head bears six pairs of eyes (ocelli), a pair of spinnerets and mandibles constituting the mouth parts.

**37.** What does butterfly feed on?

**Ans.** Butterfly suck nector from different flowers.

**38.** Name three basic divisions of the body of an insect.

**Ans.** **Three basic divisions of an insect's body:**

1. Head 2. Thorax 3. Abdomen.

**39.** What is adolescence?

**Ans.** It is the period in human development that occurs during teenage years, between the end of childhood and the start of adulthood. In this period, various physical and psychological changes occur.

**40.** What is puberty?

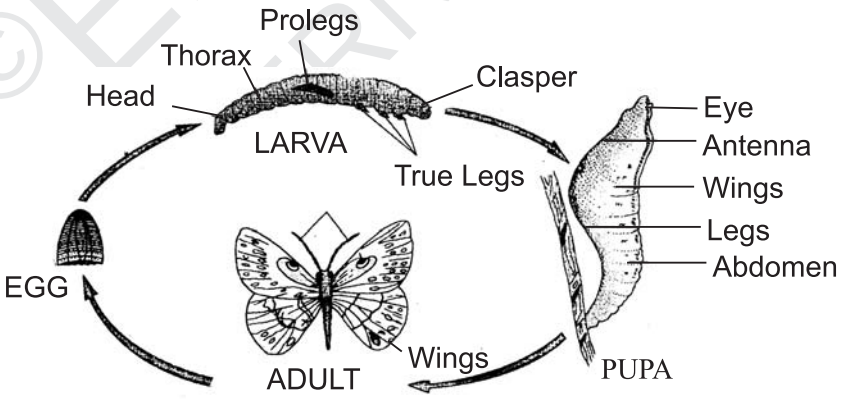
**Ans.** It is the period of sexual maturation. During this period, a person becomes sexually mature and can reproduce sexually. At this time, in boys and girls, sexual characteristic appear.

**41.** Why is the pelvis of a female wider than that of a male?

**Ans.** The pelvis of a female is wider than that of a male. Because a female have to develop a baby in the uterus.

**42.** Explain the life cycle of a butterfly.

**Ans.** A butterfly shows complete metamorphosis. The larva of butterfly comes out of the egg within 10-12 days. It looks like a worm and called **caterpillar.** Caterpillar eats a large quantity of leaves and continue to grow. It casts off the old skin and reaches its maturity level in about four weaks. Now caterpillar produces an outer covering called a **cocoon** around itself. In this cocoon, larva lies in a dormant stage, undergoes active metamorphosis. It begins next stage of life cycle called **pupa**. Within the cocoon, the tissues of larva reorganise to form the butterfly. Finally, the cocoon breakes off and an adult butterfly comes out.



**43.** Radicle emerges out of the seed earlier than plumule. What one advantage is served by this.

**Ans.** Radicle emerges out of the seed first and develop into root. These roots absorb water and transport it to plumule which develop into shoot.

**44.** What is false fruit? Give one example.

**Ans.** When a fruit develops from other parts of flower except ovary then such fruit is called the 'false fruit'. For example, an apple is a false fruit because it develops from the base of the flower, while the ovary remains in the central part containing seeds.

**45.** Imagine that all the seeds produced by a plant happen to fall under the same plant and sprout into new plants. Mention any **two** problems that will be faced by the new plants.

**Ans.** If all the seeds produced by a plant happen to fall under the same plant and sprout then there will be few problems:

(i) There will be competition among plants for water and nutrients.

(ii) There will be competition among plants for air and sunlight.

**46.** Distinguish between sexual reproduction and asexual reproduction.

**Ans. Difference between sexual and asexual reproduction.**

| **Sexual reproduction** | **Asexual reproduction** |
|---|---|
| (1) It occurs in all types of animals. | (1) It occurs in invertebrates and lower chordates. |
| (2) It involves two individuals. | (2) It involves only one individual. |
| (3) There are formation of gametes. | (3) No gametes are formed. |
| (4) Fertilisation takes places. | (4) There is no fertilisation. |
| (5) Variations are produced as it contributes two individuals. | (5) No variations are produced as it contributes only single individual. |

**47.** What is the significance of testes lying within the scrotum?

**Ans.** Testes produce a mass of sperms. These testes lie outside the abdominal cavity in a sac called the **scrotum.** In scrotum, testes are kept at a temperature 2-3°C lower than that of body temperature. This is the most suitable temperature for the production of sperms.

**48.** Why is it important that a very large number of sperms should be present in the semen?

**Ans.** It is very important that a very large number of sperms must be present in the semen because very few of them are able to climb up to the upper parts of oviducts, the rest die on the way and are absorbed. An egg is fertilized only by a single sperm.

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