CBSE Class 12 Biology
Important Questions
Chapter 1
Reproduction in Organisms

1 Marks Questions

1. Offsprings produced by asexual reproduction are referred to as clones. Why?

Ans. Because offsprings produced by Asexual reproduction is morphologically and genetically identical to parent.

2. Name the most invasive aquatic plant weed which is called as Terror of Bengal.

Ans. Water hyacinth (Eicchornia)

3. How does Zygote usually differ from Zoospore in terms of ploidy?

Ans. Zygote diploid, zoospore haploid.

4. Mention the main difference between the offspring produced by asexual reproduction and progeny produced by sexual reproduction.

Ans. Offspring produced by asexual reproduction are genetically similar while progeny produced by sexual reproduction exhibit genetic variation.

5. Which characteristic property of Bryophyllum is exploited by gardeners and farmers?

Ans. Adventitious bud arising from margin of the leaf.

6. What represents the life span of an organism?

Ans. The period from the birth to the natural death of an organism represents its life span.

7. Which individuals can be termed as clones?

Ans. The individuals who are morphologically and genetically identical are called clones.

8. How do the following organisms reproduce: Paramoecium and Penicillium?

Ans. a) Paramoecium reproduces by the process of binary fission.

b) Penicillium reproduces with the help of asexual structures called conidia.

9. State the function of a vegetative propagule.

Ans. The vegetative propagules are the asexual vegetative structures of the plant that are capable of giving rise to a new plant.

10. How will you grow a banana and a ginger plant?

Ans. The rhizomes of a banana and a ginger are used to propagate new plantlets.

CBSE Class 12 Biology
Important Questions
Chapter 2
Sexual Reproduction in Flowering Plants

1 Marks Questions

1. In a young anther, a group of compactly arranged homogenous cells were observed in the centre of each microsporangium. What is the name given to these cells?
Ans. Sporogenous tissue

2. Give the scientific name of a plant which came to India as a contaminant with imported wheat and causes pollen allergy.

Ans. Parthenium

3. Pollen grains of water pollinated species have a special characteristics for protection from water. What is that?

Ans. Presence of mucilagenous covering

4. Why are pollen grains produced in enormous quantity in Maize?

Ans. To ensure pollination because Maize is pollinated by wind.

5. In same species of Asteraceae and grasses, seed are formed without fusion of gametes. Mention the scientific term for such form of reproduction.

Ans. Apomixis

6. Arrange the following in correct developmental sequence : Male gamete, Potential pollen mother cell, sporogenous tissue, Pollen grains, Microspore tetrad.

Ans. Sporogenous tissue Potential pollen mother cell microspore tetrad Pollen grain male

gamete.

7. If the diploid number of chromosomes in an angiospermic plant is 16. Mention number of chromosomes in the endosperm and antipodal cell.

Ans. Chromosomes in endosperm and 16 chromosomes in antipodal cell.

8. What kind of structures is formed at the end of microsporogenesis and megasporogenesis?

Ans. Microsporogenesis results into formation of four haploid pollen grains arranged generally in a tetrahedral tetrad while Megasporogenesis forms four megaspores arranged in linear tetrad.

9. What is funiculus?

Ans. The stalk of the ovule is called funiculus.

10. Define parthenocarpy.

Ans. Production and development of seedless fruit is called parthenocarpy.

11. What is microsporogenesis?

Ans. The process that leads to the formation of microspores from pollen mother cell through meiosis is referred to as microsporogenesis.

12. Why is emasculation done in the process of hybridization?

Ans. Emasculation that is the stamens are removed prior to artificial hybridization to ensure no undesirable pollens fall on the stigma and the flower can be pollinated with the desired pollen grains.

13. What do you understand by double fertilization?

Ans. Fertilization or fusion in the female gametophyte happens at two cites: the egg cell and

the generative cell; the vegetative cell and the polar nuclei. This is referred to as double fertilization.

14. What is sporopollenin?

Ans. The exine of the pollen grain is composed of a highly resistant organic chemical called sporopollenin.

15. Name one plant each where pollination occurs with the help of

a) Water.

b) Bats

Ans. Water pollinated: *Vallisneria* and *Hydrilla.*

Bat pollinated: *Anthocephalous* and *Bauhinia megalandra*.

16. Why do most zygotes develop after certain amount of embryo is formed?

Ans. The zygote divides only after certain amount of endosperm is formed as it is an adaptation to provide assured nutrition to the developing embryo.

17. What is polyembryony?

Ans. Polyembryony is the phenomenon of formation of more than one embryo during the development of seed.

18. Name the type of cross pollination in Vallisneria & Bougainvillea.

Ans. (i) vallisneria - Hydrophily

(ii) Bougainvillea - Entomophily

19. How many haploid nuclei and haploid cells are present in female gametophyte of angiosperm?

Ans. 8 – haploid nuclei and 7 – haploid cells.

20. Mention the scientific term for the type of pollination which ensures Genetic

Recombination.

Ans. Xenogamy or Allogamy

21. Which are the nuclei that fuse to form endosperm?

Ans. The second male gamete fuses with secondary nucleus (which is formed by fusion of two polar nuclei) to form a triploid primary endosperm.

22. Give an example of Bat – Pollinated flower.

Ans. Adansonia digitata.

23. Why are pollen grains produced in enormous quantity in maize?

Ans. because in maize, pollen grains are transferred through air Large quantity of pollen grains are produced but only few of air-borne Pollen grains are entangled by protruding stigma.

24. Name the part of an angiosperm flower in which development of male & female gametophyte takes place.

Ans. Development of male gametophyte takes place in microspore in pollen grains & development of female gametophyte occurs in megaspore in ovule.

25. Why apple is called a false fruit. Which part of plant forms the fruit?

Ans. Apple is called a false fruit because it develops from ovary along with accessory floral plants e.g. Thalamus

26. Name the part of plant producing seed & fruit after fertilization.
Ans. After fertilization, ovule develops into seed & ovary develops into fruit.

CBSE Class 12 Biology
Important Questions
Chapter 2
Sexual Reproduction in Flowering Plants

3 Marks Questions

1. Continued self pollination lead to inbreeding depression. List three devices, which flowering plant have developed to discourage self pollination?

Ans. (a) Release of pollen and stigma receptivity is not synchronised in some species

(b) Anther and stigma are at different position/heights in some plants

(c) Self-incompatibility a genetic mechenism.

2. What will be the fate of following structures in the angiospermic plant? Ovary wall, Ovule, zygote, outer integument Inner integument and primary endosperm nucleus.

Ans. Ovary wall = Pericarp ; Ovule = Seed,

Zygote - Embryo; Outer integument = Testa;

Inner integument = Tegmen; Primary endosperm nucleus = Endosperm.

3. Differentiate between microsporogenesis and megasporogenesis. What type of cell division occurs during these events. Name the structure formed at the end of these two events.

Ans. Microsporogenesis Process of formation of microspore from a Pollen mother cell.

Megsporogenesis Process of formation of megaspore from megaspore mother cell. Meiotic division in both Microsporogenesis results in the formation of pollen grain while megasporogenesis results in the formation of megaspore.

4. Differentiate between microsporogenesis and megasporogenesis.

Ans.

Microsporogenesis	Megasporogenesis
1. It is the formation of haploid microspores or pollen grains from the diploid microspore mother cell.	1. it is the formation of megaspores from the diploid megaspore mother cell.
2. The pollen grains are arranged in tetrahedral tetrad.	2. The megaspores are arranged in linear tetrad.
3. All the microspores are functional.	3. Only one megaspore is functional. Others degenerate.

5. Explain the stages involved in the maturation of a microspore into a pollen grain.

Ans. The microspore has a dense cytoplasm and a prominent nucleus in the centre. As the microspore matures the nucleus is pushed towards the periphery due the formation of vacuoles in the upper end of the cytoplasm. The nucleus divides mitotically to form two nuclei which separate out into two cells; the upper bigger vegetative cell and the lower generative cell. A mature pollen grain normally has two cells.

6. What is triple fusion? Where does it occur?

Ans. The nucleus of the vegetative cell of the pollen grain fuse with the two polar nuclei of the central cell of the female gametophyte fuse to form the primary endosperm. This fusion is known as vegetative fusion or triple fusion as it involves three nuclei. It occurs in the central cell of the egg apparatus.

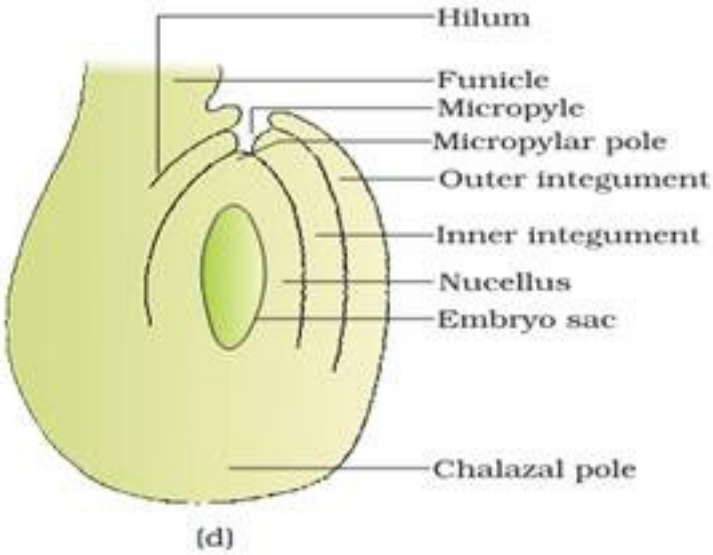
7. Explain the structure of an anatropous ovule with a neat labeled diagram?

Ans. An anatropous ovule consists of:

- a stalk called funicle attached to the placenta.
- the junction between the funicle and the ovule is called helium.
- The ovule may be surrounded by one or more integuments with an opening at the tip. The opening is called the micropyle.
- the opposite end of the micropyle is referred to as chalazal end, the basal part of the

ovule.

- mass of cells known as nucellus is present within the integuments that contain normally single embryo sac.



8. Describe the structure of a pollen grain.

Ans. The pollen grain is normally spherical with two wall layers.

- the outer layer is exine composed of highly resistant organic substance called sporopollenin which is absent at the aperture region called germ pore.
- the inner layer is the in tine which is composed of cellulose and pectin.
- a mature pollen grain has a vegetative cell and a generative cell

9. Enlist the advantages offered by seeds to angiosperms.

Ans. The significance or the importance of seed formation:

- seed formation is associated with pollination and fertilization that are independent of water and therefore more dependable process.
- it provides protection and nutrition to the developing embryo.
- seeds are means of multiplication of higher plants. Being capable of perennation, it can withstand variable climate.

10. Give any three advantages of sexual incompatibility.

Ans. Advantages of sexual incompatibility:

- it prevents self pollination.
- it has made plants outbreeders and this maintain vigour and vitality of the race.
- variations appear due to outbreeding provide adaptability to the changes in the environment.

11. List any three differences between wind pollinated flower & insect – pollinated flower.

Ans.

Wind Pollinated flower	Insect Pollinated flower
i) Flowers are small & colourless.	i) Flowers are brightly coloured
ii) Flowers do not have scent or nectar	ii) Flowers possess nectar glands.
iii) Pollen grains are dry & unwettable.	iii) Pollen grains are sticky or Spiny.
iv) Stigma is large well- exposed hairy & branched	iv) Stigma is short & is present within the flower.

12. Trace the development of microsporocyte into mature pollen grains.

Ans. i) When the anther is young, the microsporangium contains compactly arranged homogenous cells forming the Sporogeneous tissues.

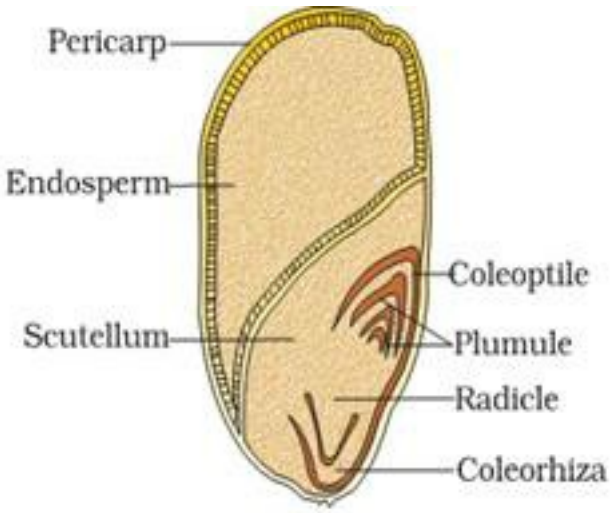
1. Every cell of the sporogenous tissue is a potential Pollen mother cell (PMC) & give rise to microspore tetrad or Pollen grains.
2. But Some of them forego this Potential & become differentiated into pollen or microspore mother cell (MMC)
3. Each microspore mother cell undergoes meiosis to form a cluster of four haploid cells called microspore tetrad.
4. As the anther matures, microspores dissociate from tetrad & develop into pollen grains.
5. The nucleus of microspore undergoes mitosis to form large vegetative cell & small generative cell. They develop a two layered wall – outer exine made up of sporopollenin

& inner intine made up of cellulose & pectin. Usually Pollen grains are liberated at two celled stage.

13. i) Explain the structure of a maize grain with the help of a diagram

ii) Why cannot we use the term maize seeds for maize grains?

Ans. (i) In grass family (eg. Maize) fruit is single seeded where pericarp & seed coat are fused together to form the husk. Just below husk, there is a layer of cells called aleurone layer, with stores proteins. There is a large endosperm that stores starch. The embryo lies on one side of endosperm & consists of a single cotyledon called scutellum & embryonal axis. The region of embryonal axis that points down ward from point of attachment of cotyledons is radicle & is covered by protective sheath called coleorhiza. The region of embryonal axis that points upward from point of attachment of cotyledon is plumule, it is covered by foliaceous sheath called coleoptite



(ii) We cannot use the term seeds for maize grain because seed is not completely developed from embryo but retains a part of endosperm.

14. Trace the development of megasporocyte into mature ovule.

Ans. i. A single Megaspore mother cell is differentiated in the micropylar region of nucleus of an ovule & undergoes meiosis & forms a cluster of haploid cells called megaspore tetrad. Of these, soon three degenerates & only one megaspore becomes functional

ii. Functional megaspore enlarges to form embryo sac. Its nucleus undergoes mitotic division & two nuclei move to opposite poles forming 2-nucleate embryo Sac.

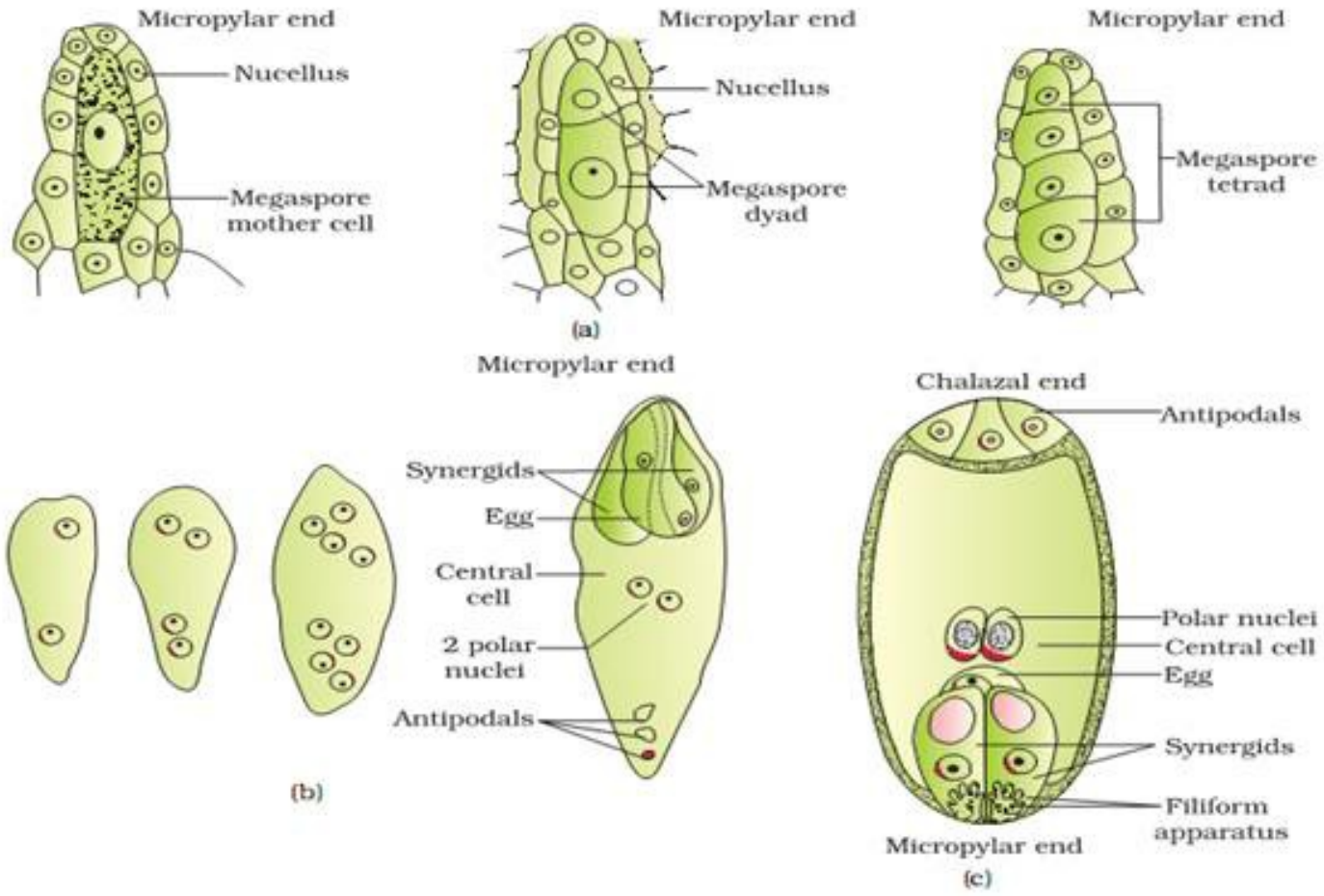
iii. Two successive mitotic divisions in each of these two nuclei results in formation of 8-nucleate embryo sac.

iv. Three cells are grouped together at micropylar end to form egg apparatus. consisting of two synergids & a female egg cell .

v. Three cells are grouped together at the chalazal end, they are called antipodal cells.

vi. The remaining two nuclei are called Polar nuclei, they move to centre of embryo sac & fuse to form Secondary nucleus.

Thus a typical angiospermic embryo sac is 8-nucleate 7-celled



15. "Incompatibility is the natural barrier in fusion of gamete". Justify this statement.

Ans. Pollen grains of a plant species cannot germinate on stigma of other unrelated species because both the species are incompatible & process is called pollen – pistil incompatibility. In many angiospermic plants, it is seen that pollen grains germinate on stigma of unrelated species but male gametes produced in pollen tube cannot fertilize egg. This is called gametic incompatibility Self incompatibility can be achieved by any of the following ways :-

1. Pollen Stigma interaction: - In this phenomenon, pollen grains fails to germinate on Stigma because of incompatibility.
2. Pollen tube style interaction: - In this phenomena, pollen grains become able to germinate on stigma & pollen tube penetrate stigmatic surface but due to incompatibility growth of pollen tube within stigma & style is inhibited.
3. Pollen – ovule interaction: - pollen tube successfully pierces & grows within style & its growth is inhibited at micropyle of ovule.

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16. How dose pollination takes place in salivia. List any four adaptations required for such type of pollination.

Ans. In salivia, entomophily or pollination lay insects occurs. The flowers of salivia are bilipped. Its upper lip consists of two petals & lower lip consists of three petals. The lower lip functions as sitting pad for insects. In normal conditions, the connective remains upright. When insect enters the tube of corolla towards nectar sitting on lower lip, it pushes sterile anther lobe which automatically brings about fertile anther to touch the back of insects gets the blow of fertile lobe. Pollen grains are dusted on back feather & legs of insects.

ADAPTAIONS EOR ENTOMOPHILY :-

1. Flowers are brightly coloured.
2. Flowers possess nectar glands.
3. pollen grains are usually sticky & spiny
4. flowers are large – sized & stout

CBSE Class 12 Biology
Important Questions
Chapter 2
Sexual Reproduction in Flowering Plants

5 Marks Questions

1. Draw the embryo sac of a flowering plants and label :

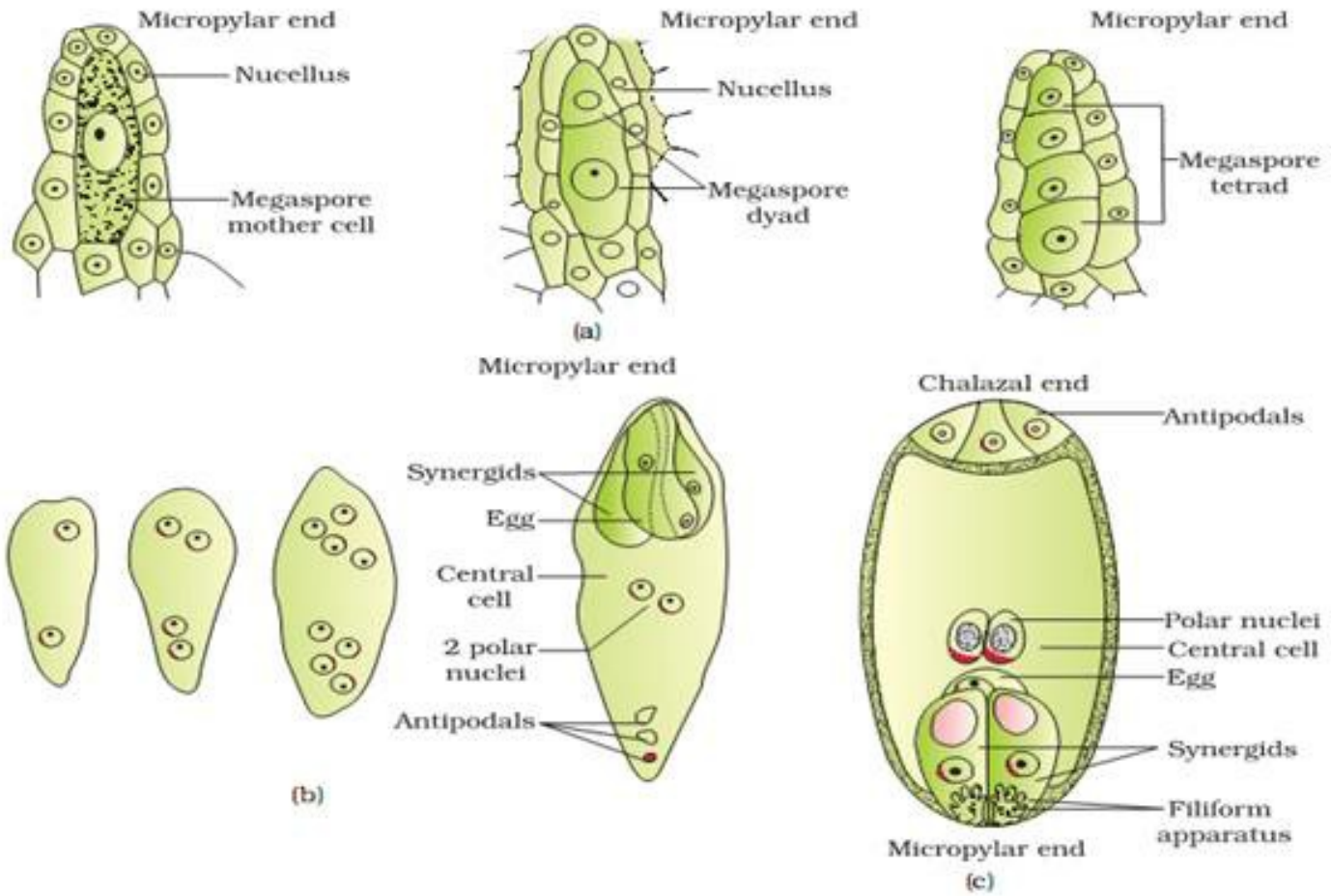
(a) (i) Central Cell (ii) Chalazal end (iii) Synergids

(b) Name the cell that develops into embryo sac and explain how this cell leads to formation of embryo sac.

(c) Mention the role played by various cells of embryo sac.

(d) Give the role of filiform apparatus.s

Ans. (a)



(b) Functional Megaspore

(c) Egg : Fuses with male gamete to form zygote or future embryo

Synergid : Absorption of nutrient, attract and guides pollen tube.

Central Cell : After fusion with second male gamete forms Primary endosperm cell which gives rise to Endosperm

(d) Guides the entry of pollen tube.

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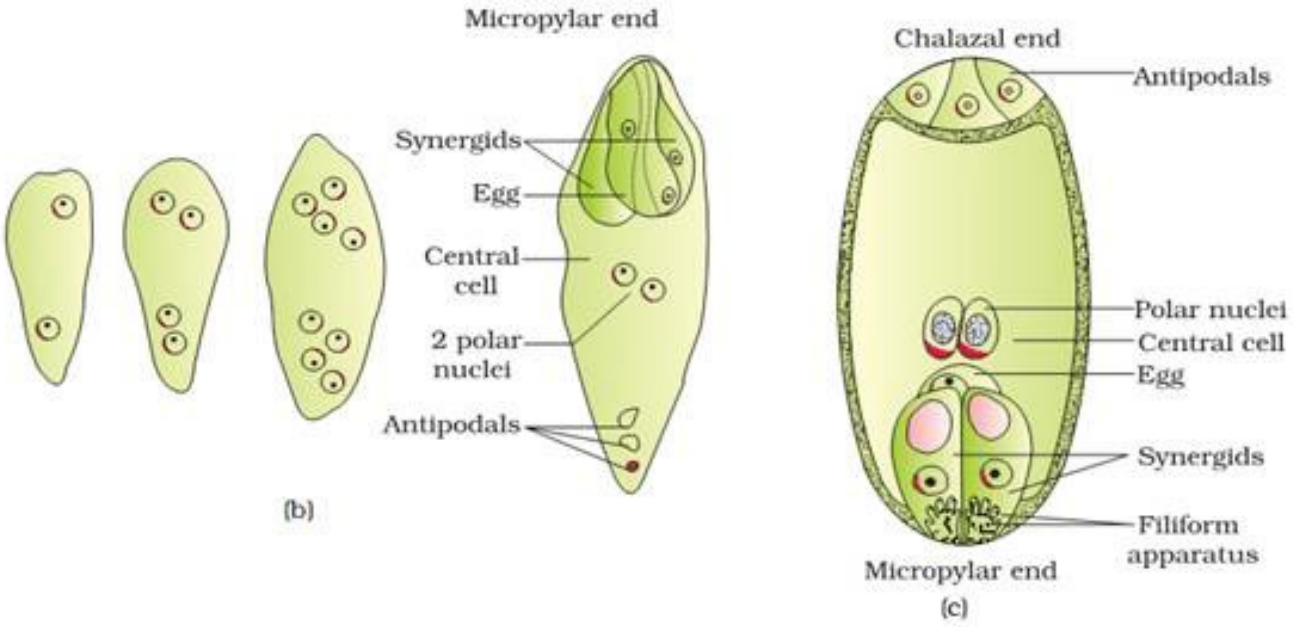
2. Explain the formation of an embryo sac with diagrams.

Ans.

- The functional megaspore grows in size.
- The nucleus divides mitotically to form two nuclei which move to opposite poles.
- Each nucleus at the poles undergoes two mitotic divisions to form four nuclei in each

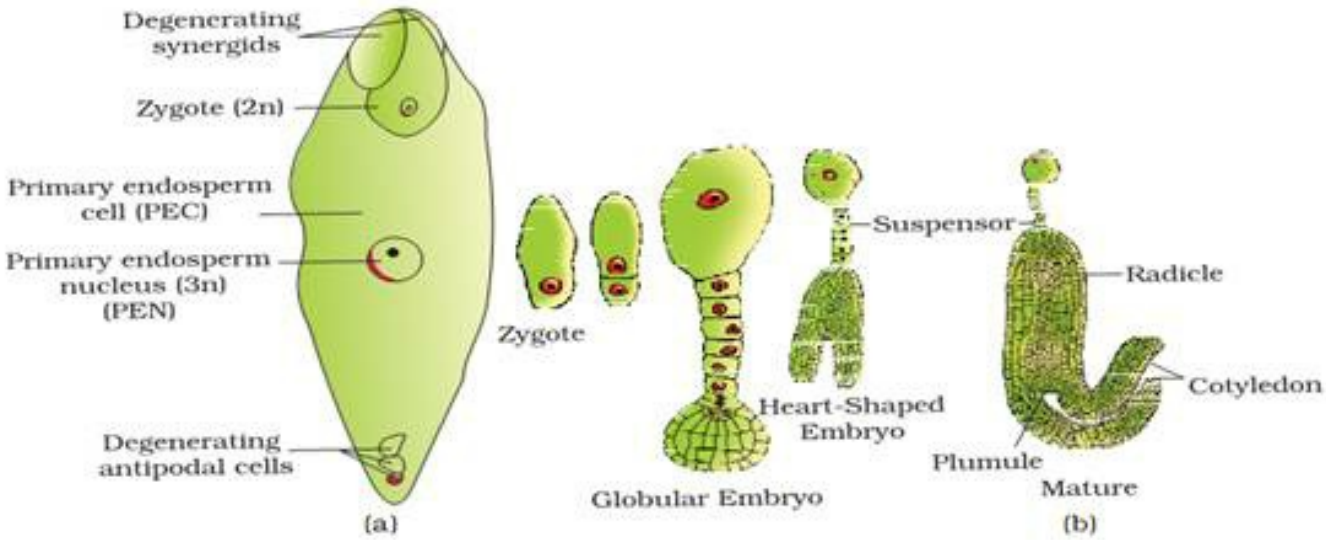
pole or a total of 8 nuclei.

- two nuclei from each pole move to the centre to form the polar nuclei.
- the other nuclei, three at each pole get surrounded by bit of cytoplasm to form cells.
- the female gametophyte or the embryo sac thus has 7 cells and eight nuclei.

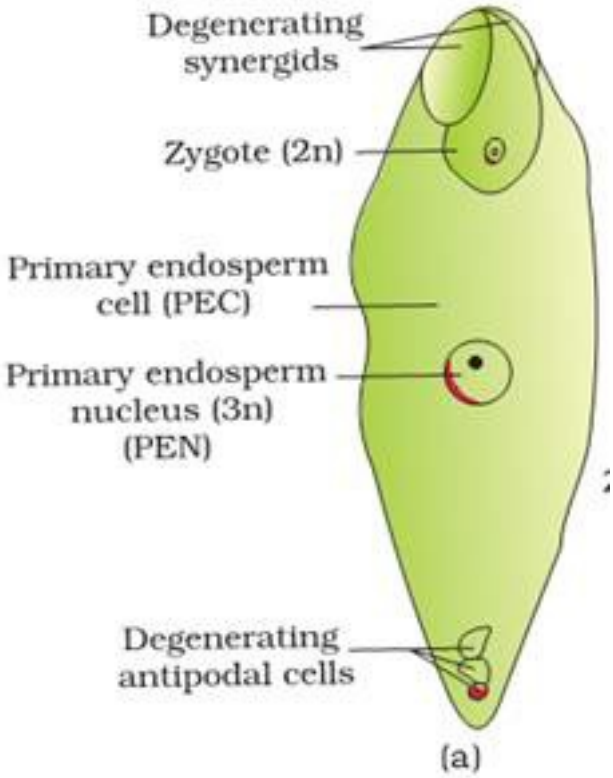


3. Explain the development of embryo in a dicotyledonous plant with neatly labeled diagrams.

Ans. The embryo develops at the micropylar end where the zygote is located. The zygote starts developing only after certain amount of endosperm is formed to assure nutrition to the embryo. The zygote divides mitotically to form various stages including pro- embryo, globular, heart shaped and finally the mature embryo



4.Describe the post-fertilization changes taking place in a flowering plant?

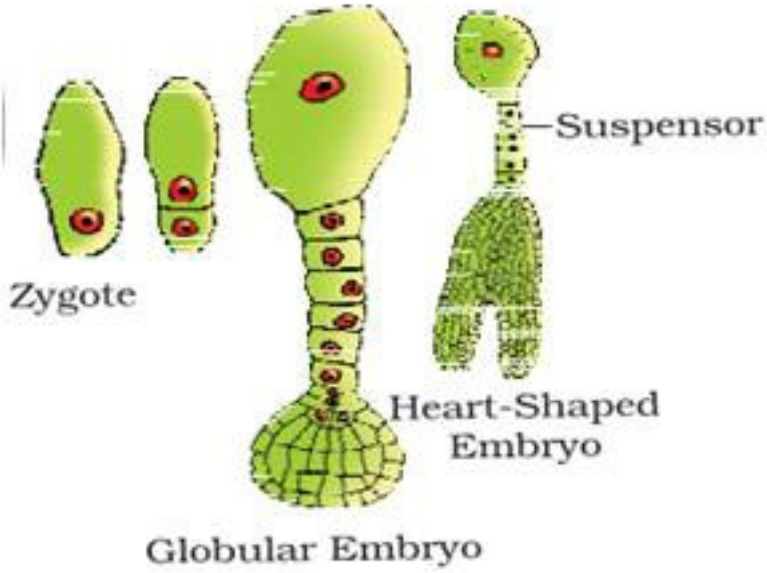


Ans. The major events taking place in a flowering plant after fertilization:-

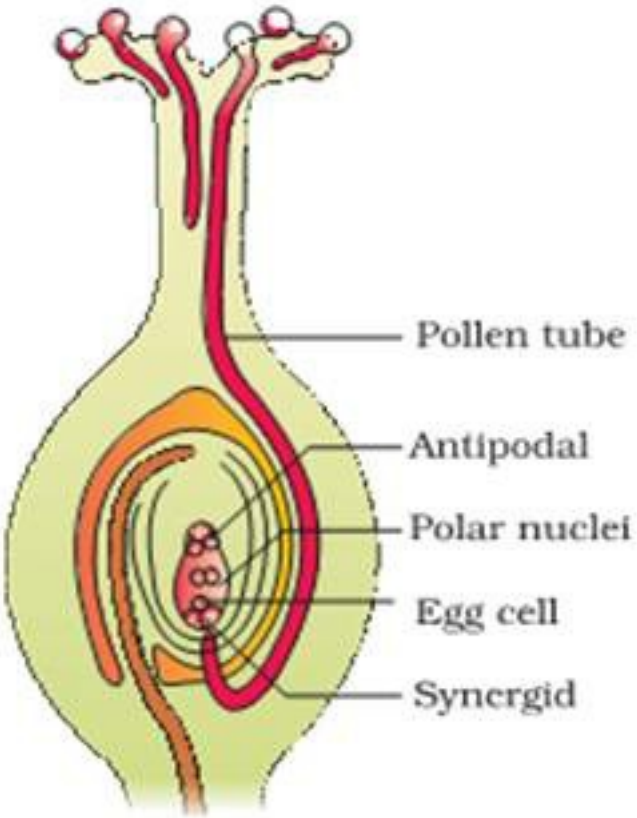
(i) DEVELOPMENT OF ENDOSPERM:- Endosperm development proceeds embryo development . The most common method of endosperm development is nuclear type where triploid endosperm (PEN) undergoes repeated mitotic divisions without cytokinesis – Subsequently cell wall formation occurs from periphery & endosperm store food materials

which is later used up by embryo.

(ii) DEVELOPMENT OF EMBRYO :- The zygote divides lay mitosis to for a pro-embryo first . Later development results in formation of globular & heart shaped embryo & that ultimately become horseshoe – shaped embryo with one or more cotyledons. In dicot embryo, the portion of embryonal axis about the level of attachment is epicotyl & it terminates into plumule while portion of embryonal axis below the level of attachment is hypocotyl & terminates into radicle.



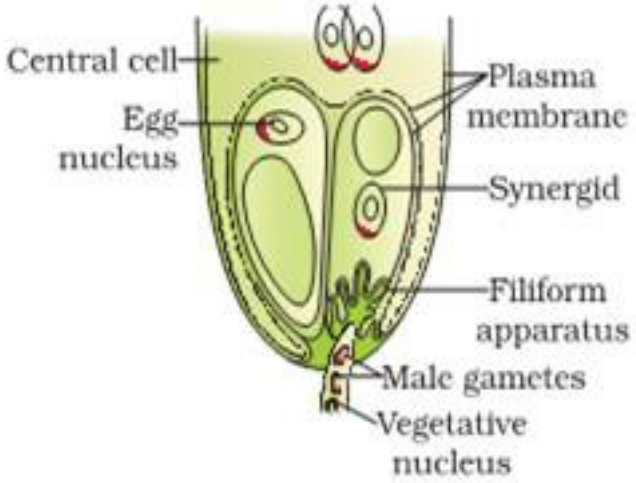
5.Trace the events that would take place in flower from the time of Pollen grain of species fall on stigma up To completion of fertilization.



Longitudinal section of a flower showing growth of pollen tube

Ans. GERMINATION OF POLLEN GRAINS ON STIGMA

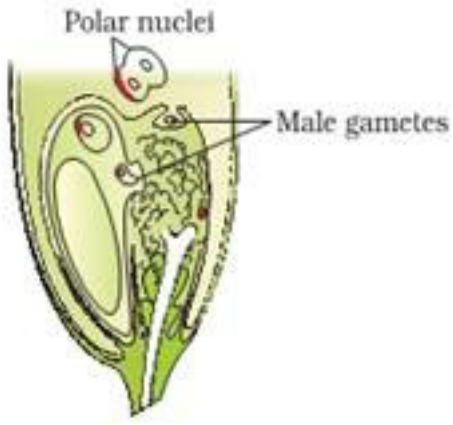
The pollen grains absorb fluid present on stigma & swell up. The exine ruptures at the place of germ pore & intine comes out in the form of tube with its internal contents. This small tubular structure is called pollen tube & process is called pollen germination.



ii) Entry of pollen tube into Ovule: - The entry of pollen tube into ovule occurs through

micropyle or chalaza or through lateral sides of ovule. Only one pollen tube enters inside the embryo sac of an ovule. Normal two synergids are destroyed while entry of pollen tube into embryo sac.

iii) Discharge of Mate Gametes :- After enter of pollen tube both the male gametes discharged into embryo sac by either forming two pores into pollen tube & each male gamete is discharged through every pore or sometime pollen tube may burst & release the male gametes into embryo sac.



iv) Fertilization:- The fusion of first male gamete (n) with egg (n) is called fertilization. It results in formation of a diploid zygote (2n). The second male gamete fuses with secondary nucleus (2n) to form triploid endosperm nucleus (3n). This fusion between second male gamete & secondary nuclei is triple fusion. Since process of fertilization occurs twice. It is called double fertilization.

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6. i)Why is zygotes dominant for sometime in fertilized ovule.

ii) What is polyembryony? Give an example.

iii) In fruits, what is formed from following parts :-

a) Ovary wall

b) Outer integument

c) Inner integument

d) zygote

e) primary endosperm

f) Ovary

g) Nucellus

Ans. (i) Zygote remain dominant for sometime in a fertilized ovule because embryo develops after formation of endosperm therefore zygote wants for formation of endosperm which supplies food material for developing embryo

(ii) The presence of more than one embryo in a seed is called polyembryony eg. Sometimes more than one embryo is formed within an embryo sac either by cleavage or splitting of egg, synergid, antipodal or endosperm.

(iii) In fruits, the following is formed from given parts:-

a)	Ovary wall	Per carp
b)	Outer integument	Testa
c)	Inner integument	Tegmen
d)	zygote	embryo
e)	primary endosperm	endosperm
f)	Ovary	fruit
g)	Nucellus	perisperm.

CBSE Class 12 Biology
Important Questions
Chapter 3
Human Reproduction

2 Marks Questions

1. Give the function of

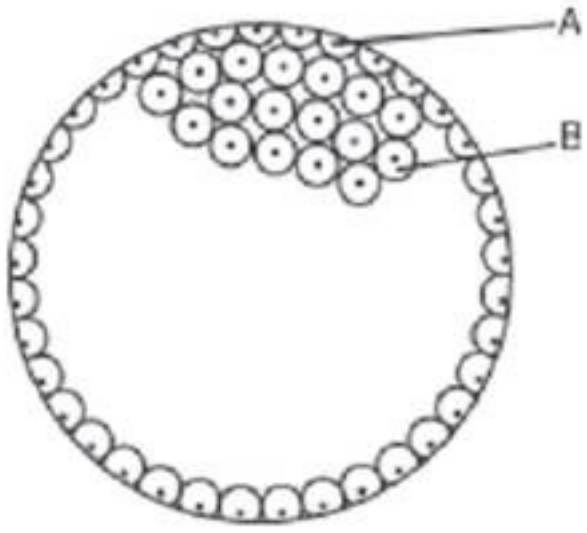
(a) Corpus luteum

(b) Endometrium

Ans. Corpus luteum : It secretes progesterone which prepares endometrium of uterus for implantation and normal development of foetus.

Endometrium : It undergoes cyclic changes during menstrual cycle and prepares itself for implantation of blastocyst.

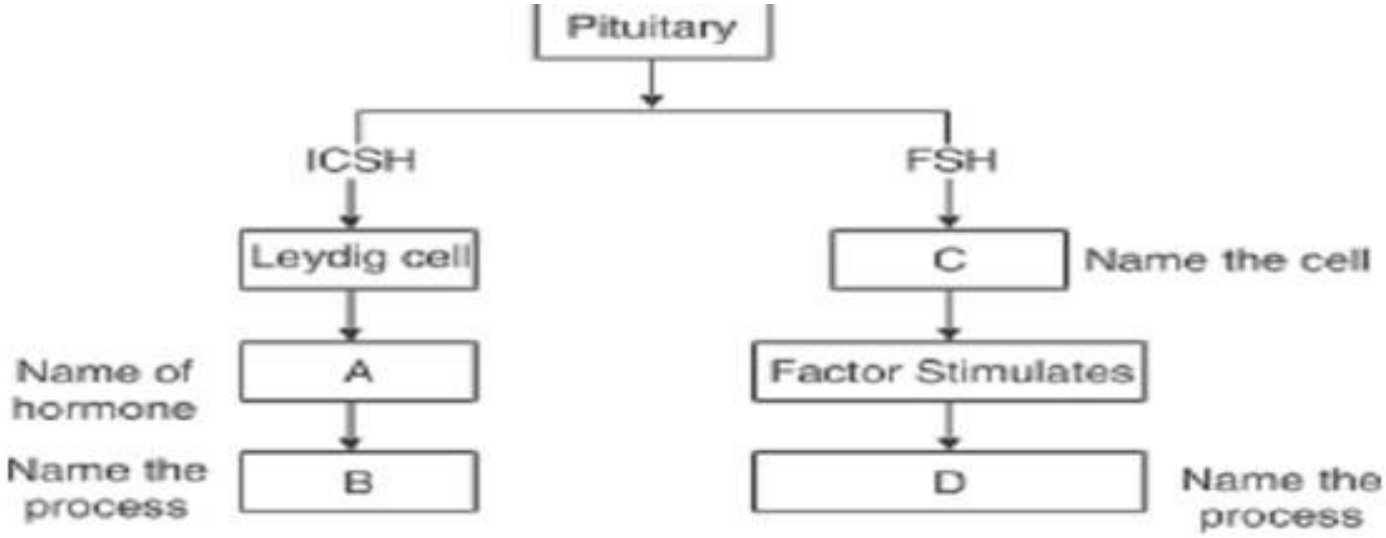
2. In the given figure, give the name and functions of parts labeled A and B.



Ans. A = Trophoblast Gets attached to endometrium and draws nutritive material secreted by uterine endometrium gland.

B = Inner cell mass Differentiates as Embryo.

3. Given below is an incomplete flow chart showing influence of hormone on gametogenesis in male, observe the flow chart carefully and fill in the blank A, B, C and D.



Ans. A = Testosterone; B = Spermatogenesis

C = Sertoli cells; D Spermiogenesis

4. Give reason for the following :

(a) The first half of the menstrual cycle is called follicular phase as well as proliferative phase.

(b) The second half of the menstrual cycle is called luteal phase as well as secretory phase.

Ans. (a) During this phase, primary follicles transform into Graafian follicle under FSH stimulation. Graafian follicles secrete estrogens with stimulate enlargement of Endometrium of uterus.

(b) During this phase, Corpus luteum is fully formed and secretes large quantity of Progestrone.

5. What is meant by L.H. Surge? Write the role of L.H.

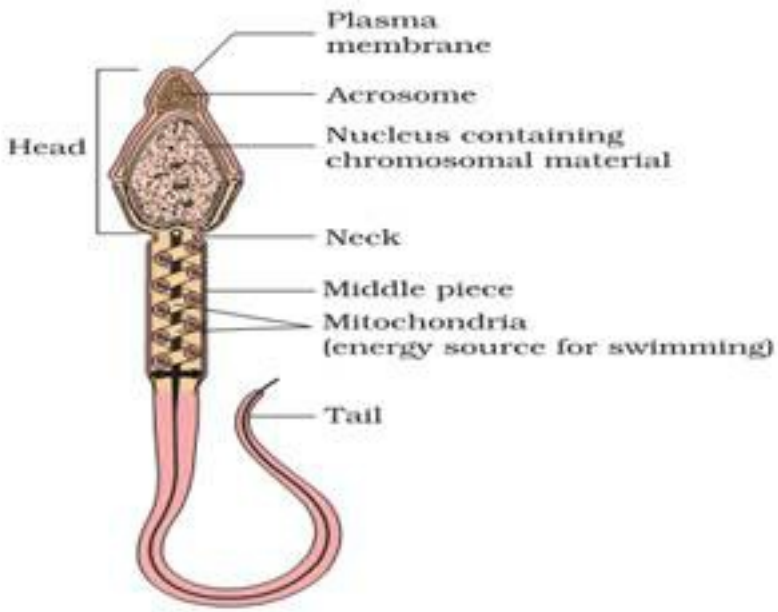
Ans. There are three phases in your menstrual cycle – follicular phase, ovulatory phase and luteal phase. In terms of the luteinizing hormone (LH) surge, the ovulatory phase is most important. During the follicular phase the follicle develops at the beginning of the menstrual cycle. This cycle begins with the menstrual period, the shedding of the iuterine lining and the shedding cleanses the lining of the uterus in preparation for ovulation during the ovulatory phase.

6. Explain significance of the condition in which the testes remain suspended in scrotum outside the abdomen.

Ans. Human sperm cells cannot develop at body temperature. Spermatogenesis and maintenance of the seminiferous tubules requires a temperature slightly lower than that of the body. This is provided by the scrotum, which lies outside the abdominal cavity.

7. Describe the structure of a sperm with a diagram.

Ans. The human sperm is a microscopic structure with a head, middle piece and a tail. The head has the haploid nucleus and an anterior acrosome that contains the enzymes required for the fertilization of the egg. The middle piece has numerous mitochondria to produce the energy for the mobility of the tail of the sperm.



8. Enlist any two functions of a female placenta.

Ans. The structural and the functional unit between the developing embryo and the mother called placenta facilitates the supply of nutrients, oxygen to the embryo and also the removal of carbon dioxide and other excretory products produced by the embryo. It also acts as endocrine tissue and produces several hormones

9. What is the number of chromosomes in the following cells? Primary oocyte, secondary oocyte, ootid and follicle.

Ans. The number of chromosome in the cells is as follows:

Primary oocyte: 23 pairs. Secondary oocyte: 23. Ootid: 23. Follicle: 23 pairs.

10. What is corpus luteum. How dose it functions as endocrine gland?

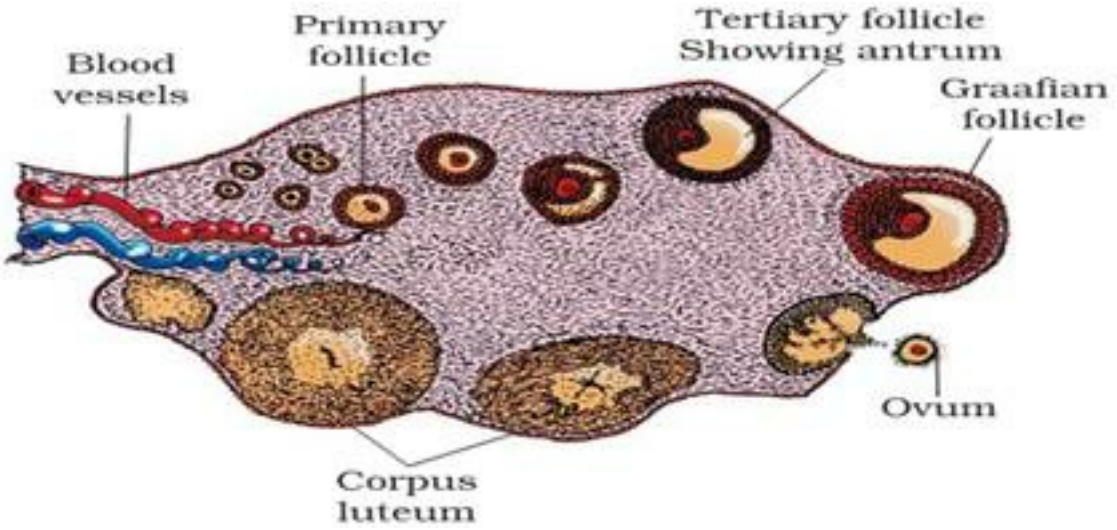
Ans. After ovulation, the graffian follicle ruptures & forms corpus luteum. Corpus luteum functions as endocrine glands as they secrete progesterone & estrogen in large quantities.

11. Where are leydig cells located? What do they secrete?

Ans. Leydig cells or interstitial cells are located in between the sominiferous tubules. Leydig cells secrete male sex hormone TESTOSTERONE which promotes development of accessory glands & control male secondary sexual characters.

12. Draw well labeled diagram of T.S. of ovary?

Ans.

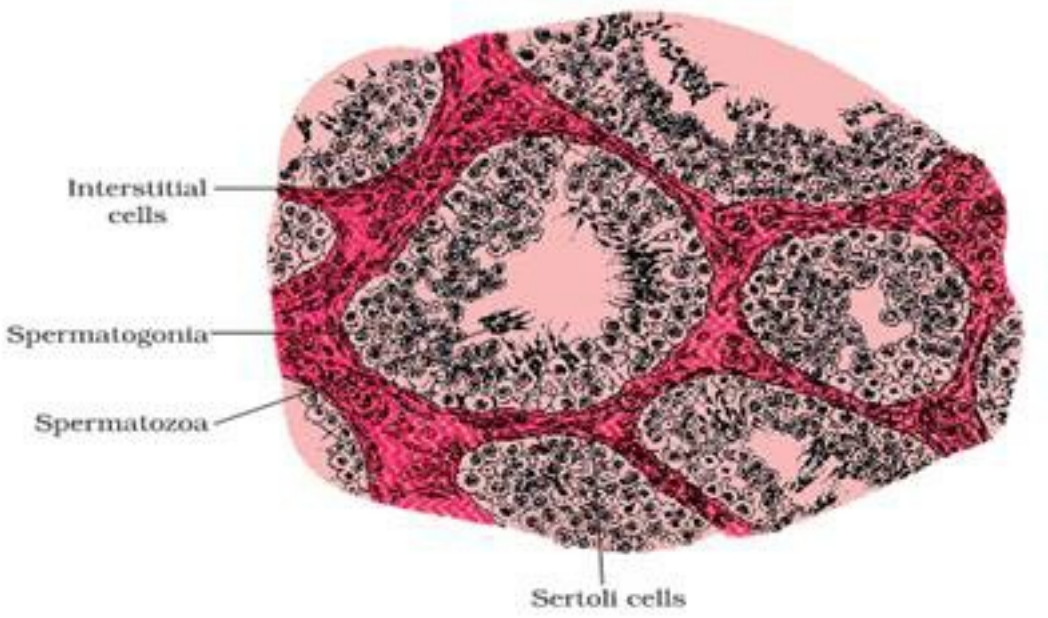


13. Why testes of human males are considered extra abdominal? What is the significance of this condition?

Ans. Testis in human males are called extra- abdominal because testis are located outside the abdominal cavity in a pouch called scrotum which provides a temperature 2-3oC lower than body temperature necessary for spermatogenesis.

14. Draw a diagram of the T.S. of seminiferous tubule of testis of an adult human male & label any four parts in it.

Ans.



15. What is colustrum? What is its significance to new born baby?

Ans. The milk secreted from mammary glands just after birth for 2 or 3 days is called colustrum. It is rich in proteins & low in fats. It also contains antibody IgA which provides immunity to new born infant.

CBSE Class 12 Biology
Important Questions
Chapter 3
Human Reproduction

3 Marks Questions

1. Mention the name and role of hormones which are involved in regulation of gamete formation in human male.

Ans. GnRH : Stimulates adenophysis to secrete gonadotrophins.

GSH : Stimulates Sertoli cells to secrete factors while help inspermatogenesis.

ICSH : Stimulates interstitial cells to secrete testosterone.

2. Three of the steps of neuro endocrine mechanism in respect of parturition are mentioned below.

Write the missing steps in proper sequence.

(a) Signals originate from fully developed foetus and placenta.

(b) _____.

(c) _____.

(d) Oxytocin causes strong uterine contraction

(e) Uterine contraction stimulates further secretion of oxytocin.

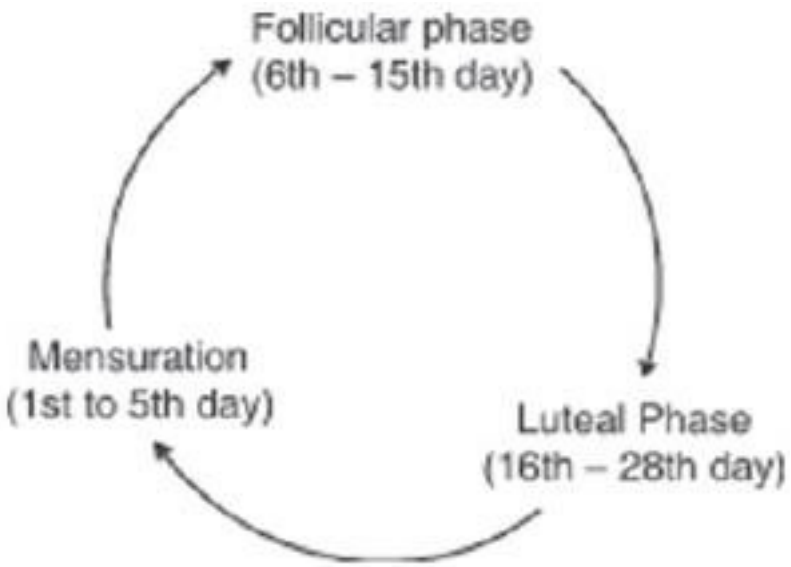
(f) _____.

Ans. (b) Foetal ejection reflex

(c) The reflex triggers release of oxytocin

(f) Expulsion of the baby out through birth canal.

3. The events of the menstrual cycle are represented below. Answer the following questions.



(i) State the levels of FSH, LH and Progesterone simply by mentioning high or low around 13th and 14th day and 21st to 23rd day.

(ii) In which of the above mentioned phases does egg travel to fallopian tube?

(iii) Why there is no mensuration after fertilisation?

Ans. (i) 13-14th day 21st -23rd day

FSH - High Low

LH - High Low

Progesterone - Low High

(ii) End of follicular or proliferative phase.

(iii) Menstruation does not occur during pregnancy upon fertilization due to high level of progestenone secreted by persisting corpus luteum and Placenta.

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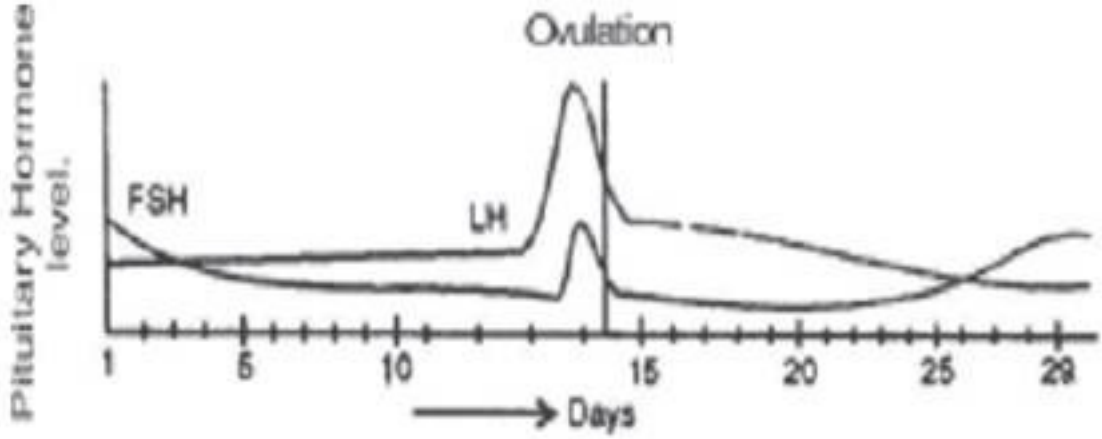
4. (a) Read the graph given below. Correlate the ovarian events that take place in the human female according to the level of the pituitary hormone during the following day.



(i) 10th - 14th days (ii) 14th -15th days

(iii) 16th - 23th days (iv) 25th - 29th days

(If the ovum is not fertilised)

(b) What are the uterine events that follow beyond 29th day if the ovum is not fertilised?

Ans. (a) (i) Gonadotropins and FSH increases

(ii) LH attains peak level but FSH decreases

(iii) LH and FSH level decreases

(iv) LH remains low and FSH increases.

(b) After 29th day there is a mentrual flow involving discharge of blood and cast off endometrium lining.

---

5. T.S. of mammalian testis revealing seminiferous tubules show different types of cell.

(i) Name the two types of cells of germinal epithelium.

(ii) Name of cells scattered in connective tissue and lying between seminiferous tubules.

Differentiate between them on the basis of their functions.

Ans. (i) Germinal epithelium have two types of cell. 1. Spermatogonium. 2. Sertoli cells

(ii) Leydig cells or Interstitial cells.

Functions

Spermatogonium undergoes meiotic division leading to sperm formation.

Sertoli cell : Nourishes germ cells

Leydig cell : Synthesise and Secrete hormone androgen.

---

6. What are the various male accessory glands? Give their function.

Ans. The male accessory glands include paired seminal vesicles, a prostrate gland and paired bulbourethral glands.

These glands secrete seminal plasma rich in fructose, calcium and certain enzymes. Secretions of bulbourethral glands help in lubrication of the penis.

---

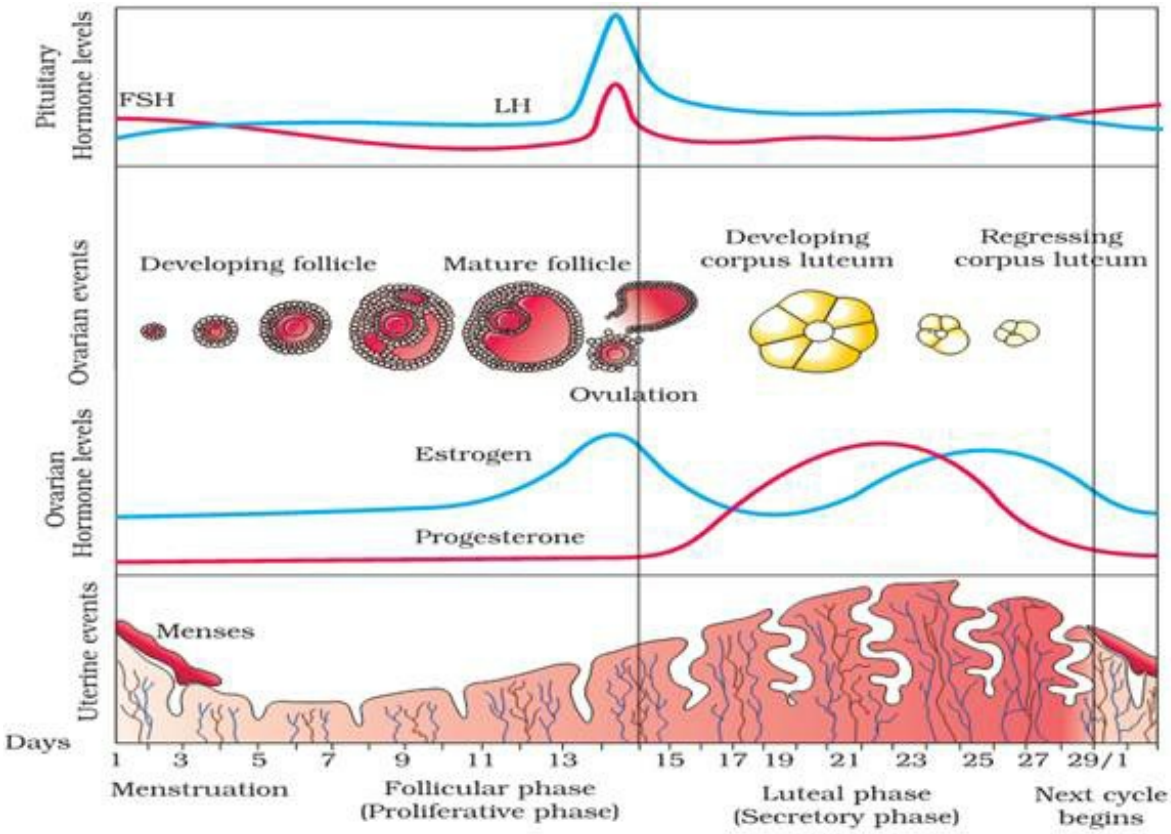
7. Explain the menstrual cycle with a diagram.

Ans. Menstrual cycle has three phases: menstrual, proliferative and secretory.

a) Menstrual Phase: The phase lasts for 3-5 days in human females and during this period the endometrial lining of the uterus is cast off and is slowly passed out from vagina as a mixture of blood.

b) Proliferative or Follicular Phase: It lasts for 11 days between 6th to 16th day of the cycle. During this phase one ovarian follicle is changed into Graafian follicle and the endometrial layer is rebuilt along with repair of the ruptured blood vessels. Estrogen increases. It ends with ovulation.

c) Secretory Phase: It lasts for 12 days between 17-28 days. The Graafian follicle is converted to Corpus Luteum. The endometrium grows and thickens further. Progesterone increases. It end with the conversion of corpus luteum to corpus albic



8. Differentiate between spermatogenesis and oogenesis.

Ans.

Spermatogenesis	Oogenesis
1. It occurs inside the testes.	1. It occurs inside the ovary.
2. All the stages are completed inside the testes.	2. Majority occurs inside the ovary but last stages occur in the oviduct.
3. Spermatogonia develop from the germinal epithelium lining in the seminiferous tubules.	3. Oogonia develop from the germinal epithelium overlying the ovary.
4. All spermatogonia give rise to spermatocytes.	4. Only few oogonia give rise to oocytes.
5. Primary spermatocytes divide by meiosis	5. Primary oocyte undergoes meiosis I to give rise to one secondary oocyte and a

I to give rise to two secondary spematocytes	polar body.
6. Secondary spermatocyte divides by meiosisII to give rise to two spermatids.	6. Secondary oocyte divides by meiosisII to form the ovum and the second polar body.
7. Each spermatid differentiates into spermatozoan or sperm.	7. No differentiation is required after meiosisII.
8. The sperms formed are motile.	8. The ovum or egg is non- motile.

9. 'A fertilized egg is the blue print of future development'. Explain

Ans. The sperm carries the genetic information from the father in form of 23 chromosomes (including the male sex chromosome X or Y) while the egg bears the genetic information from the mother (including the female sex chromosome X). Thus during fertilization the fusion of the male and the female gametes produce new genetic combination which introduces variation in the progeny. The zygote or the fertilized egg contain the genetic information which accordingly controls the development of the embryo.

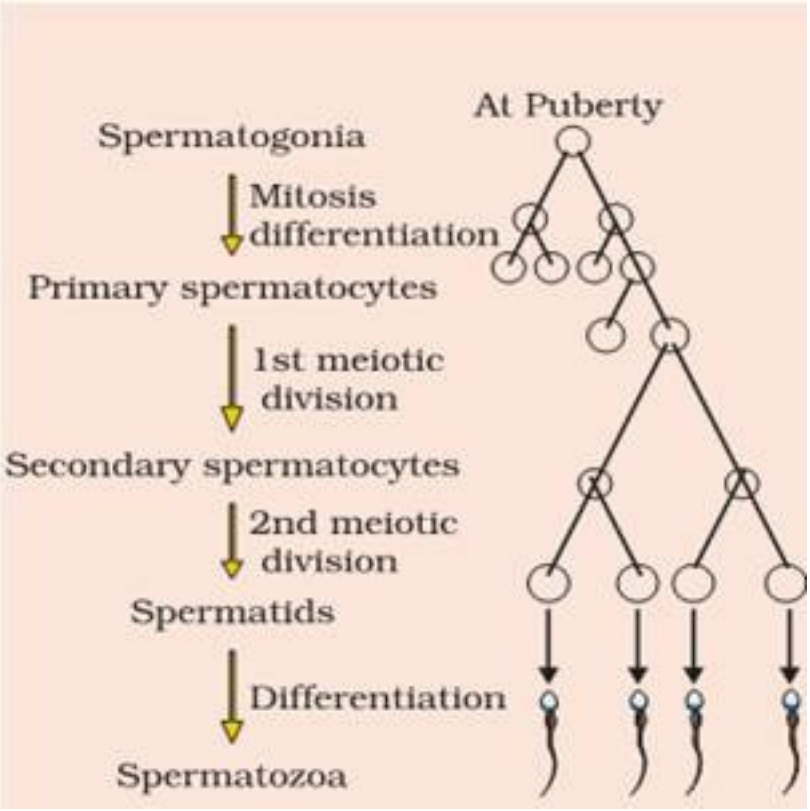
10. Briefly describe the stages of spermatogenesis in human?

Ans. Spermatogenesis consists of two phases:-

I. FORMATIDN OF SPERMATIDS :- It further consist of 3 phases

1. Multiplication phase :- undifferentiated germ cells undergo repeated division to produce sperm mother cell or spermatogonia.
2. Growth phase :- Spermatogonia increase in volume & is now called PRIMARY SPERMATOCYTES.
3. Maturation phase: - primary spermatocyte undergoes meiosis I to produce small size haploid secondary spermatocyte secondary spermatocyte divides by meiosis – II & forms haploid Spermatids.

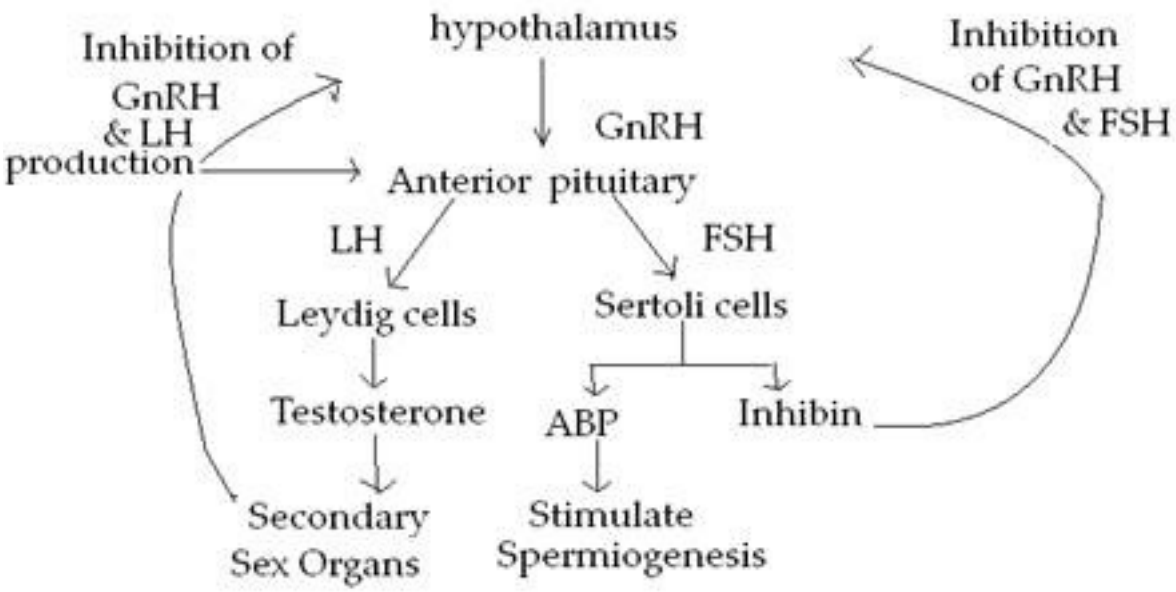
II.FORMATION OF SPERMS :- The tramsformation or differentiation of spermatids into spermatozoa or sperm is called spermiogenesis & occurs under the influence of FSH



11. Describe the hormonal control of human male reproduction system with the help of a flow chart & highlight the inhibitory & stimulatory directions in it?

Ans. i) Spermatogenesis is initiated due to an increase in the secretion of Gonadotropin releasing hormone from hypothalamus at the age of puberty.

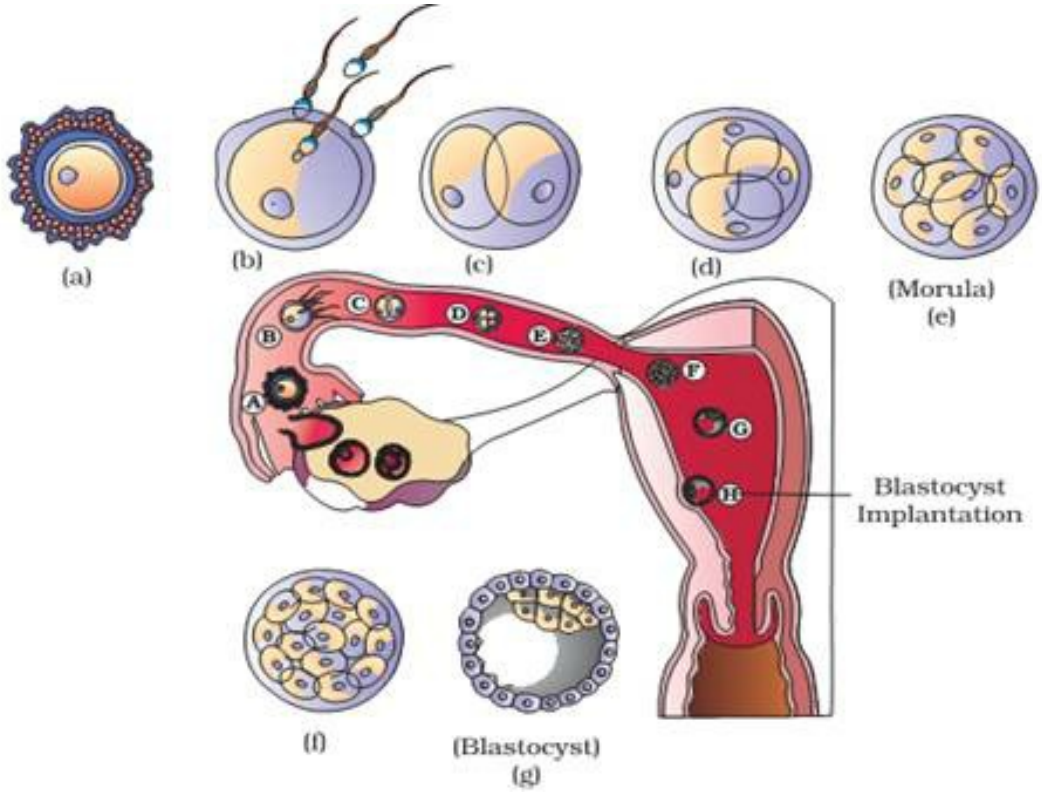
1. The increased levels of GnRH act on anterior pituitary& stimulate the secretion of two gonadotropins i-e. leuteinizing hormone (LH) & follicle stimulating hormone (FSH)
2. LH acts on leydig cells & stimulate them to secrete testosterone
3. FSH acts on sertoli cells & stimulate secretion of some factors help in spermiogenesis



12. A sperm has just fertilized a human egg in the fallopian tube. Trace the events that the fertilized eggs will undergoes upto implantation of blastocyst in the uterus.

Ans. 1. CLEAVAGE :-Fertilized egg starts dividing lay specific mitotic divisions called cleavage. The zygotes undergoes mitotic division in the isthmus of oviduct to form daughter cell the cells formed as a result of cleavage called blastomere

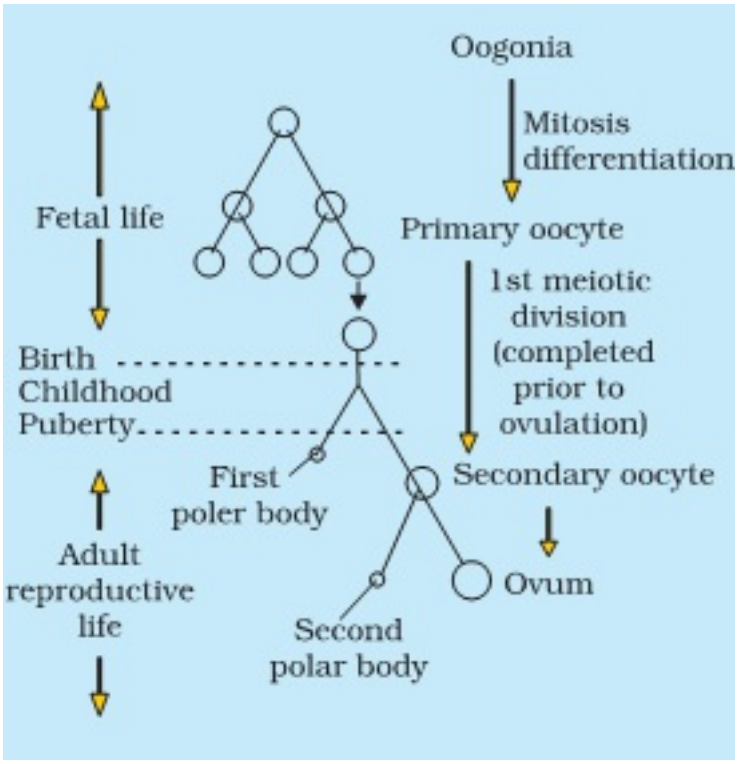
2. BLASTOCYST :- 3-4 days after fertilization, the morula twins into large mass of cells called blastocyst Outer peripheral cells enlarge & flatten further & form trophoblast. Trophoblast cells secretes a fluid into interior & form a cavity called blastocoel. The embryonic stage with blastocoels is called blastula.



13. Where oogenesis does takes place. Describe the stages of this process?

Ans. The process of formation & maturation of ovum is called oogenesis. It takes place in ovary & is initiated during embryonic development of female foetus. It consists of 3 phases :--

1. Multiplication phase :- The primordial germ cells divide by meiosis to produce oogonia. These oogonia divide lay repeated mitotic divisions forming clusters. In each cluster only one of them enters into growth phase & is called primary oocyte.
2. Growth phase :- Growth phase occurs only after attainment of puberty. It involves – increase in size of oocyte to many folds & synthesis of you.
3. Maturation phase :- The first division is meiotic as a result two haploid (n) cells are produced. In this division, cytobinesis is unequal, large daughter cell with almost all cytoplasm is called secondary oocyte & smaller me with less cytoplasm is called polar body. The secondary oocyte then undergoes second meiotic division to form an ovum & second polar body.


Oogonia
Mitosis
differentiation
Fetal life
Primary oocyte
1st meiotic
division
(completed
prior to
ovulation)
Birth
Childhood
Puberty
First
poler body
Secondary oocyte
Adult
reproductive
life
Ovum
Second
polar body

CBSE Class 12 Biology
Important Questions
Chapter 4
Reproductive Health

1 Marks Questions

1. Give the term for prenatal diagnostic technique aimed to know the sex of developing foetus and to detect congenital disorders.

Ans. Amniocentesis.

2. After a successful in vitro fertilisation, the fertilised egg begins to divide. Where is this egg transferred before it reaches the 8-celled stage and what is this technique called?

Ans. Fallopian tube; Zygote intra fallopian transfer (ZIFT)

3. Give the term for rapid population growth.

Ans. Population explosion.

4. Name the fluid from which foetal cells are extracted for chromosomal analysis.

Ans. Amniotic fluid.

5. Give technical name of female used to bring up in vitro fertilized egg to maturity.

Ans. Surrogate mother.

6. Name the oral contraceptive developed by CDRI, Lucknow.

Ans. Saheli

7. What is the WHO's interpretation of reproductive health?

Ans. WHO defines reproductive health as total well being in all respects of reproduction including physical, emotional, behavioural and social.

8. Why has the Government imposed a statutory ban on amniocentesis?

Ans. The Government has banned amniocentesis to check on the incidences of female foeticides.

9. Expand MTP and ICSI.

Ans. MTP: Medical Termination of Pregnancy.

ICSI: Intra Cytoplasmic Sperm Injection.

10. What is lactational amenorrhoea?

Ans. It refers to absence of menstruation during period of intense lactation.

11. Write the scientific name of causative agents of :--

i) Syphillis

ii) Gonorrhoea.

Ans. (i) Treponema Pallidum

(ii) Neisseria Gonorrhoea

12. Name the technique by which one can disorder any possible chromosomal or metabolic disorders in foetus.

Ans. Amniocentesis.

13. Expand the following :--

i) GIFT

ii) ICSI

iii) IUCD

Ans. (i) Gamete Intrafallopian transfer.

(ii) Intra Cytoplasmic Sperm injection

(iii) Intra uterine contraceptive devices.

CBSE Class 12 Biology
Important Questions
Chapter 4
Reproductive Health

2 Marks Questions

1. Lactational Amenorrhea is a method of contraception Justify. What is the maximum effectiveness of this method in terms of period/duration?

Ans. (a) Ovulation and menstrual cycle do not occur during the period of intense lactation following parturition. Therefore, as the mother breast feeds, chances of conception are nil.

(b) It is effective only upto a maximum period of six months following parturition.

---

2. How are non medicated IUDS different from hormone releasing IUDS? Give examples.

Ans. (a) Non medicated IUDs = Lippes loop, Copper releasing IUDS (CuT, Multiload 375) ® These increase phagocytosis of sperms within uterus and release copper ions which suppress sperm motility and fertilizing capacity of sperm.

(b) Hormone releasing IUDs - Progestasert, LNG-20 -These makes uterus unsuitable for implantation and the cervix hostile to sperms.

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3. What are implants? How do they help in preventing fertilisation?

Ans. The structures which contain hormones like progesterone and estrogen and are placed under the skin.

---

4. Briefly explain two natural barriers for birth control.

Ans. Periodic abstinence couple should avoid coitus from 10th to 17th day of menstrual cycle. Coitus interruptus Male partner withdraws his penis from the vagina just before ejaculation of semen.

5. Enlist any four possible reasons for infertility in human beings.

Ans. Physical, congenital disease, Drugs, Immunological and even psychological (any four).

6. What does GIFT represent?

Ans. It is the introduction of two unfertilized oocytes and several sperms into the fallopian tube of a woman desirous to be a mother through laproscope. The eggs may be hers or a donor's. The sperms may be of her husband's or of a donor. Fertilisation occurs in vivo and the development of the foetus takes place through natural process.

7. How does Cu- T act as a contraceptive?

Ans. It is an intrauterine device having ionized copper. The copper diffuses into the uterus and brings about the release of toxic cytokines. They inhibit sperm motility and therefore fertilization of ovum.

8. Mention any four probable reasons for the rapid rise of population in our country?

Ans. The probable reasons could be:

- Steady decline in the death rate due to improved health services.
- Early marriages especially in certain rural areas.
- Lack of education among the poor and they fail to understand the ill effects of a large family.
- Longer life span.

9. Identify the device used for the following methods of birth control: Barrier, IUD, Surgical technique and Administering hormone.

Ans. Barrier: Condom, IUD: Copper –T, Surgical technique: Vasectomy or Tubectomy, Administering Hormone : Oral Pill.

10. What are STDs? Mention any two of it.

Ans. Diseases or infections transmitted through sexual intercourse are collectively called Sexually Transmitted Diseases or STDs. Ex: Syphilis and Gonorrhoea.

11. "Removal of Gonads cannot be a contraceptive option". Why?

Ans. Because in this methods, gonads are surgically removed it will lead to infertility & both male & female will be dependent on hormones in their remaining life to regulate functioning of many reproductive org**.**

12. What are MTPs ? Under what conditions MTPs are legally permitted?

Ans. MTP refers to as medical termination of pregnancy. It is legalized in our country only:-

1. in case of rape.
2. in case of casual unprotected intercourse
3. in case pregnancy is harmful for foetus or for mother.

13. Describe the technique which is used for sex determination in foetus?

Ans. Amniocentesis is the prenatal diagnosis in which sample of amniotic fluid from womb of a pregnant women is taken during early stages of foetal development, the cells are cultured & analyzed to determine the sex of foetus.

14. What are test tube babies? Are they different from normal babies?

Ans. The baby produced lay conceiving eggs & sperms in a culture tube (envitro fertilization) & nursing in the uterus is called a test – tube baby. They are same as normal babies only the fertilization for such zygote occurs in in-vitro conditions.

15. Mention any four objectives of RCHC.

Ans. RCHC refers to a popular programme called "Reproductive & child health care (RCHC) & the major tasks under these programmes are :-

1. Creating awareness about various reproduction related aspects eg. STDs, birth control

methods.

2. Providing facilities & support for building up reproductive healthy society.
3. Educating people about care of pregnant women, important of breast feeding.
4. awareness about sex abuse & sex related crimes

CBSE Class 12 Biology
Important Questions
Chapter 5
Principles of Inheritance and Variation

3 Marks Questions

1. A woman with O blood group marries a man with AB blood group

(i) work out all the possible phenotypes and genotypes of the progeny.

(ii) Discuss the kind of dominance in the parents and the progeny in this case.

Ans. (i) Blood group AB has alleles as IA, IB and O group has ii which on cross gives the both blood groups A and B while the genotype of progeny will be IAi and IBi.

(ii) IA and IB are equally dominant (co-dominant). In multiple allelism, the gene I exists in 3 allelic forms, IA, IB and i.

---

2. Explain the cause of Klinefelters syndrome. Give any four symptoms shown by sufferer of this syndrome.

Ans. Cause : Presence of an extra chromosome in male i.e., XXY. Symptoms : Development of breast, Female type pubic hair pattern, poor beard growth, under developed testes and tall stature with Feminized physique.

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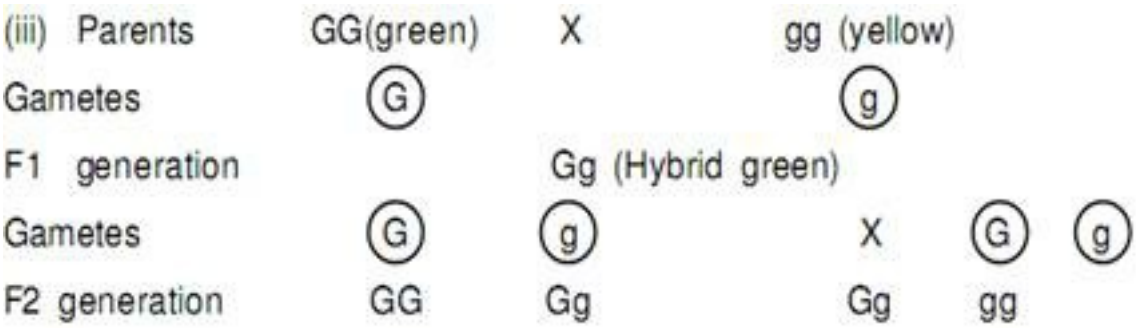
3. In Mendels breeding experiment on garden pea, the offspring of F2 generation are obtained in the ratio of 25% pure yellow pod, 50% hybrid green pods and 25% green pods State (i) which pod colour is dominant (ii) The Phenotypes of the individuals of F1 generation. (iii) Workout the cross.

Ans. (i) Green pod colour is dominant

(ii) Green pod colour

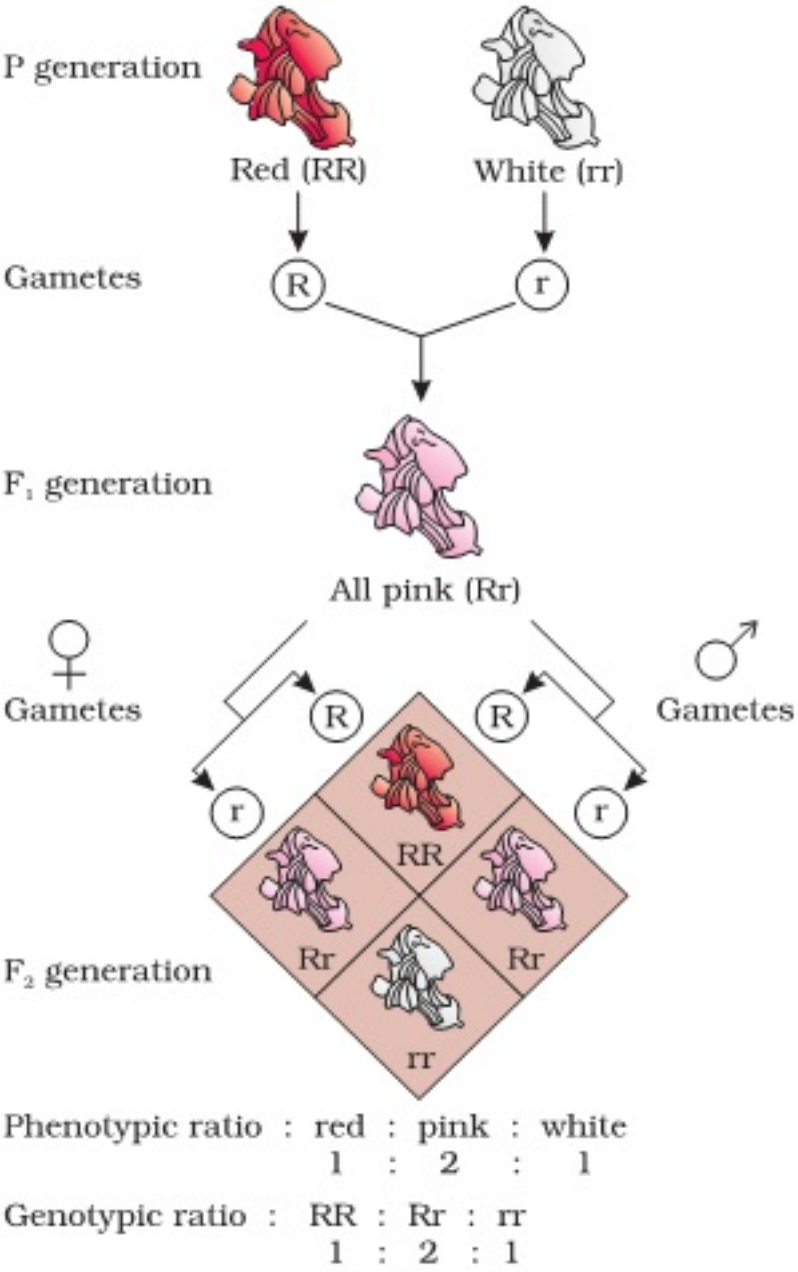


Phenotypic ratio 3 : 1

Genotypic ratio 1 : 2 : 1

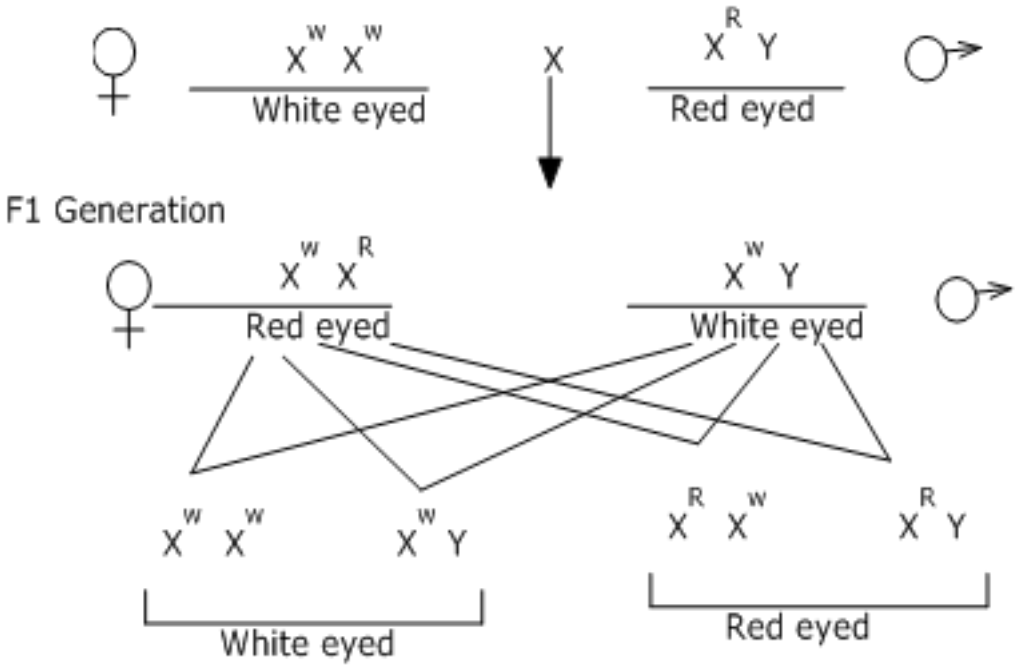
4. In Antirrhinum majus a plant with red flowers was crossed with a plant with white flowers. Work out all the possible genotypes & phenotypes of F1 & F2 generations comment on the pattern of inheritance in this case?

Ans. The inheritance of flower colour in snapdragon or Antirrhinum majus is an example of incomplete dominance. When a cross was made between a red flowered plant & a white flowered plant, the F1hybrid was pink i-e-an intermediate between red & white which means that both red & white are incompletely dominant. When F1 individuals was self – pollinated, the F2 generation consists of red, pink & white flower appears in ratio 1:2:1 respectively.

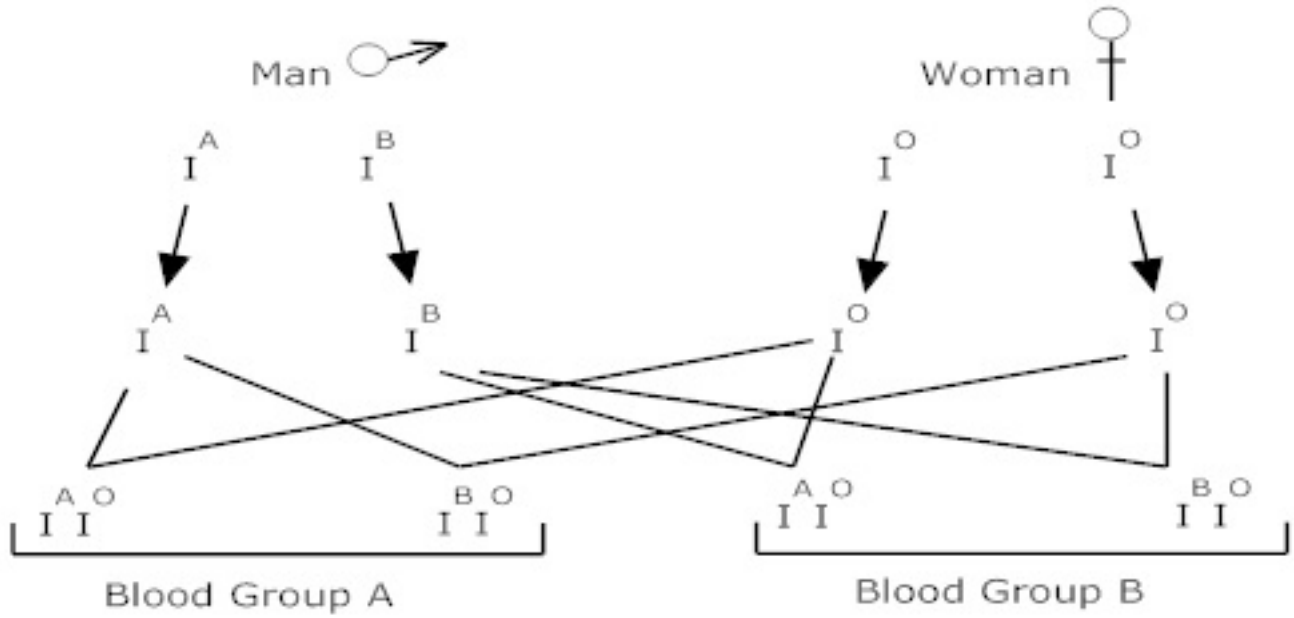


5. A red eyed male fruitfly is crossed with white eyed female fruitfly. Work out the possible genotype & phenotype of F1 & F2 generation. Comment on the pattern of inheritance in this cross?

Ans. When a red eyed is crossed with white eyed female fruitfly, offspring will have both white eyed male & red eyed female in 1:1 ration in F1 generation. In F2 generation, 50% females will be red – eyed & 50% will be white eyed, similarly, in males 50% will be red eyed & 50% will be white eyed. This result indicates that in sex-linked genes, males transmit their sex-linked characters to their grandson through their daughter; such type of inheritance is called criss-cross inheritance –



6. A man with AB blood group marries a woman with O group blood.



(i) Work out all the possible phenotypes & genotypes of the progeny.

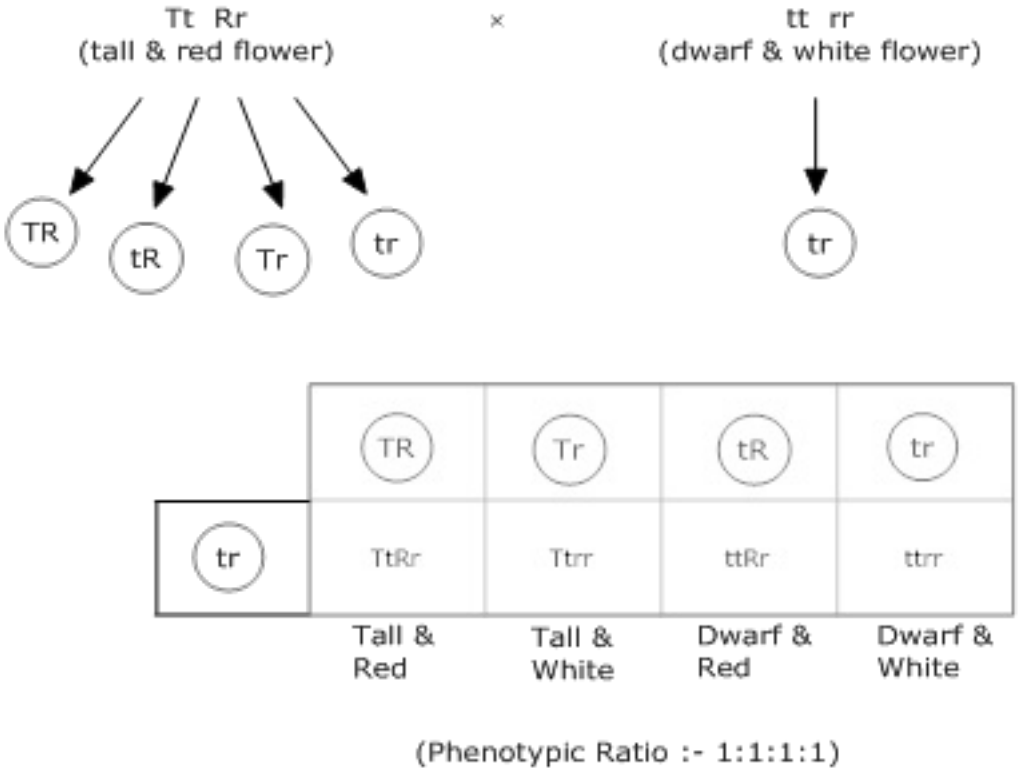
(ii) Discuss the kind of domination in parents & progeny in this case?

Ans. (i) Half the progeny will have blood group A with genotype IA IO & half the progeny will have blood group B with genotype IB IO.

(ii) IA & IB both the genes are dominant over IO gene hence progeny shows either blood group A or B while in parents since both the dominant genes are present together man will have blood group AB & this phenomena is called co-dominance.

7. In an cross made between a hybrid tall & red plant (TtRr) with dwarf & white flower (ttrr). What will be the genotype of plants in F1 generation?

Ans.



(Phenotypic Ratio :- 1:1:1:1)

8. How sex is determined in human brings?

Ans. In human beings, it was found that all the females bear a pairs of X-chromosome while males have one X-chr & also one Y-chr which is comparatively smaller in size.

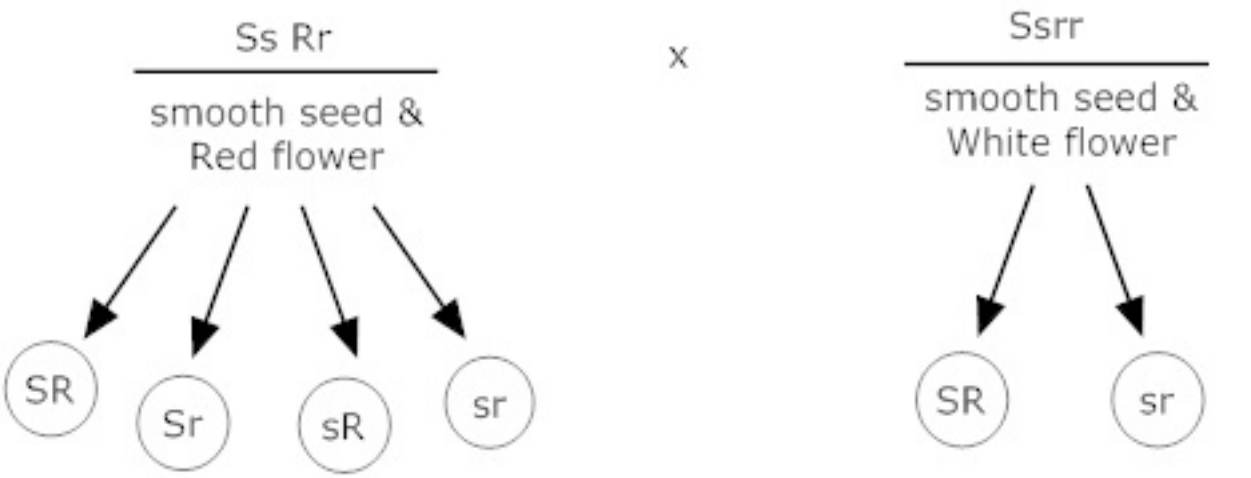
Thus in a cross between male & female there is equal probability of males & females in progeny & sex is determined by presence of a Y-chr. if Y-chr is present it is male otherwise it is a female.

9. A smooth seeded & red – flowered pea plant (SsRr) is crossed with smooth seeded &

white flowered pea plant (Ssrr). Determine the phenotypic & genotypic ratio in f1 progeny?

Ans.

1. Smooth seed & red flower =3
2. Smooth seed & white flower =3
3. Rough seed & red flower =1
4. Rough seed & white flower =1



	SR	Sr	sR	sr
SR	SSRr smooth & red	SSrr smooth & white	SsRr smooth & red	Ssrr smooth & white
sr	SsRr smooth & red	SSrr smooth & white	ssRr rough & red	ssrr rough & white

CBSE Class 12 Biology
Important Questions
Chapter 5
Principles of Inheritance and Variation

5 Marks Questions

1. A dihybrid heterozygous round, yellow seeded garden pea (Pisum sativum) was crossed with a double recessive plant.

(i) What type of cross is this?

(ii) Work out the genotype and phenotype of the progeny.

(iii) What principle of Mendel is illustrated through the result of this cross?

Ans.(i) It is a dihybrid test cross

(ii)

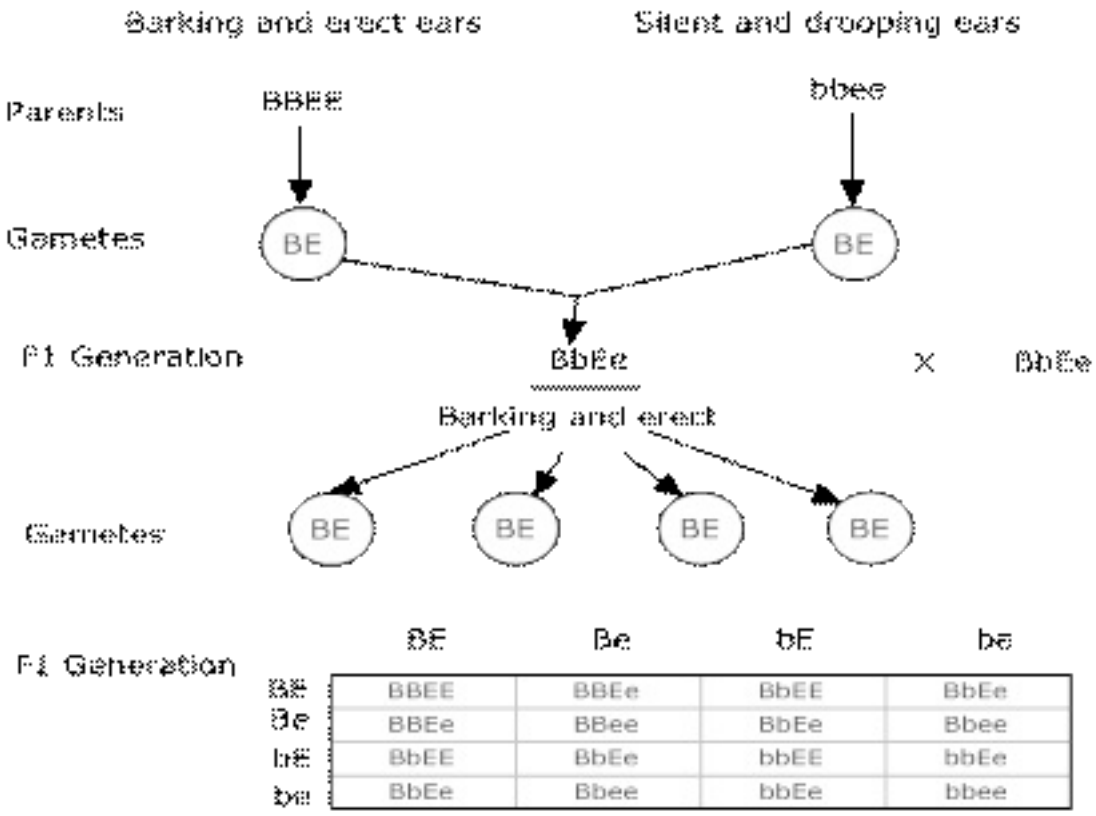
Gametes (RY), (Ry), (rY), (ry) X (ry)

	Gametes	RY	Ry	rY	ry
F_1 progeny	ry	RrYy Round, Yellow	Rryy Round and Green	rrYy Wrinkled Yellow	rryy Wrinkled, Green
Phenotypic ratio		: 1	: 1	: 1	: 1
Genytopic ratio		: 1	: 1	: 1	: 1

(iii) It illustrates the Principle of independent assortment.

2. In dogs, barking trait is dominant over silent trait & erect ears are dominant over drooping ears. What is the expected phenotypic ratio of offspring when dogs heterozygous for both the traits are crossed?

Ans.



Ration :- Barking & erect = 9

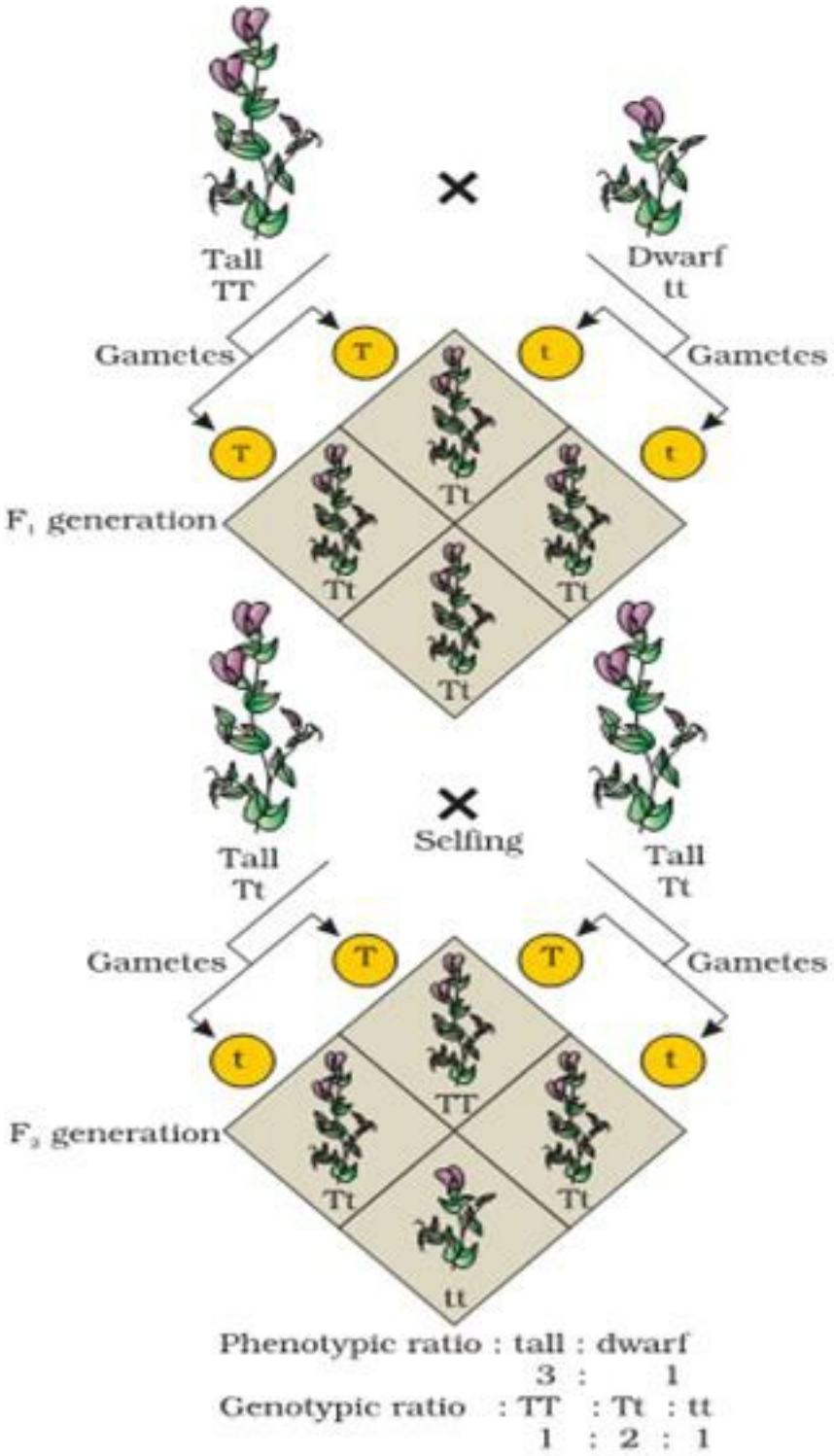
Barking & drooping =3

Silent & erect = 3

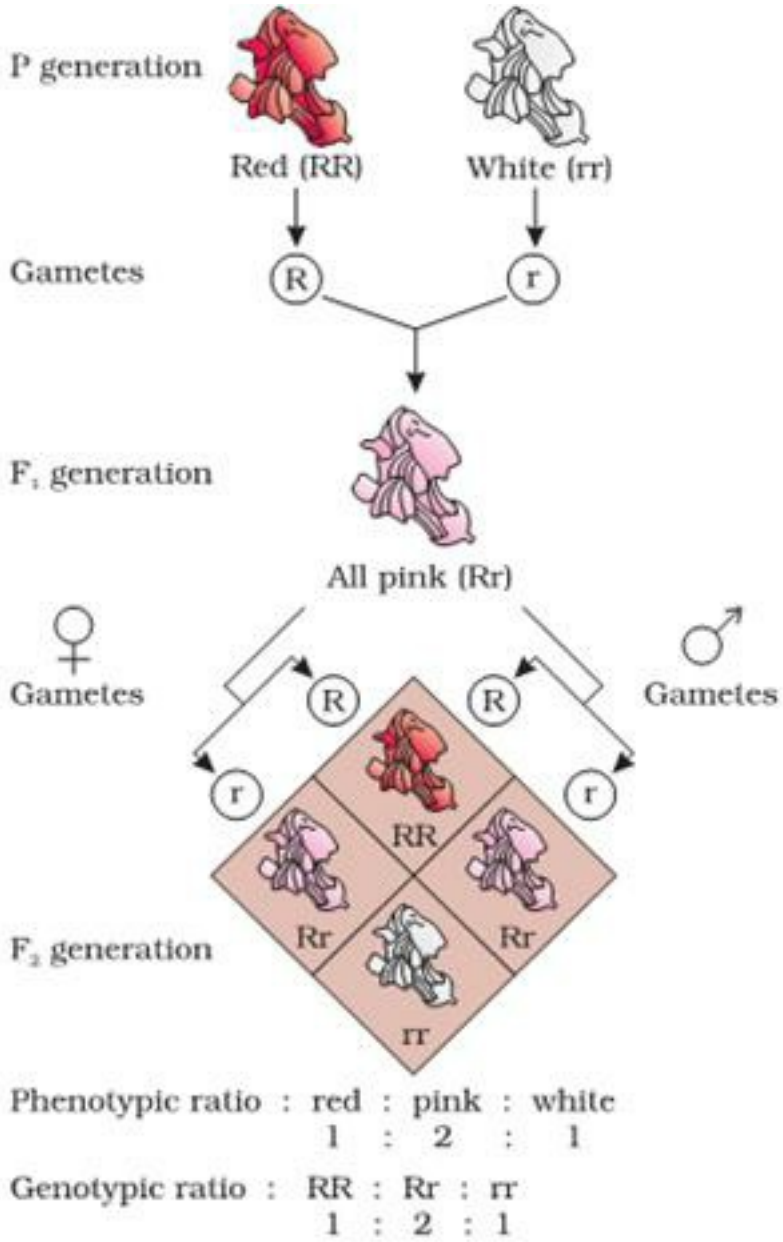
Silent & drooping =1

Phenotypic ratio = 9 : 3 : 3 : 1

3. Differentiate between dominance, co-dominance & Incomplete dominance with one example each.



Ans. (i) Dominance :- When a cross is made between true – breeding tall pea plant & true – breeding dwarf pea plant, all the plants in F1 generation are tall this sows that tall character is dominant over dwarf



(ii) Co-dominance :- If the two equally dominant genes are present together, both of them will be equally expressed, this phenomena is called co-dominance eg alleles of blood group IA & IB ore dominant over IO but when both the alleles are present together, both of them will equally express & forms a phenotype AB.

Allele from Parent 1	Allele from Parent 2	Genotype of offspring	Blood types of offspring
I^A	I^A	$I^A I^A$	A
I^A	I^B	$I^A I^B$	AB
I^A	i	$I^A i$	A
I^B	I^A	$I^A I^B$	AB
I^B	I^B	$I^B I^B$	B
I^B	i	$I^B i$	B
i	i	i i	O

(iii) In complete dominance :- When a cross is made between two characters of which none of them is completely dominant then an intermediate character develops in the progeny eg. when a cross is made between red flower & white flower in snapdragon flower an intermediate pink colour appears in the progeny

4. A dihybrid heterozygous tall & yellow pea plant was crossed with double recessive plant.

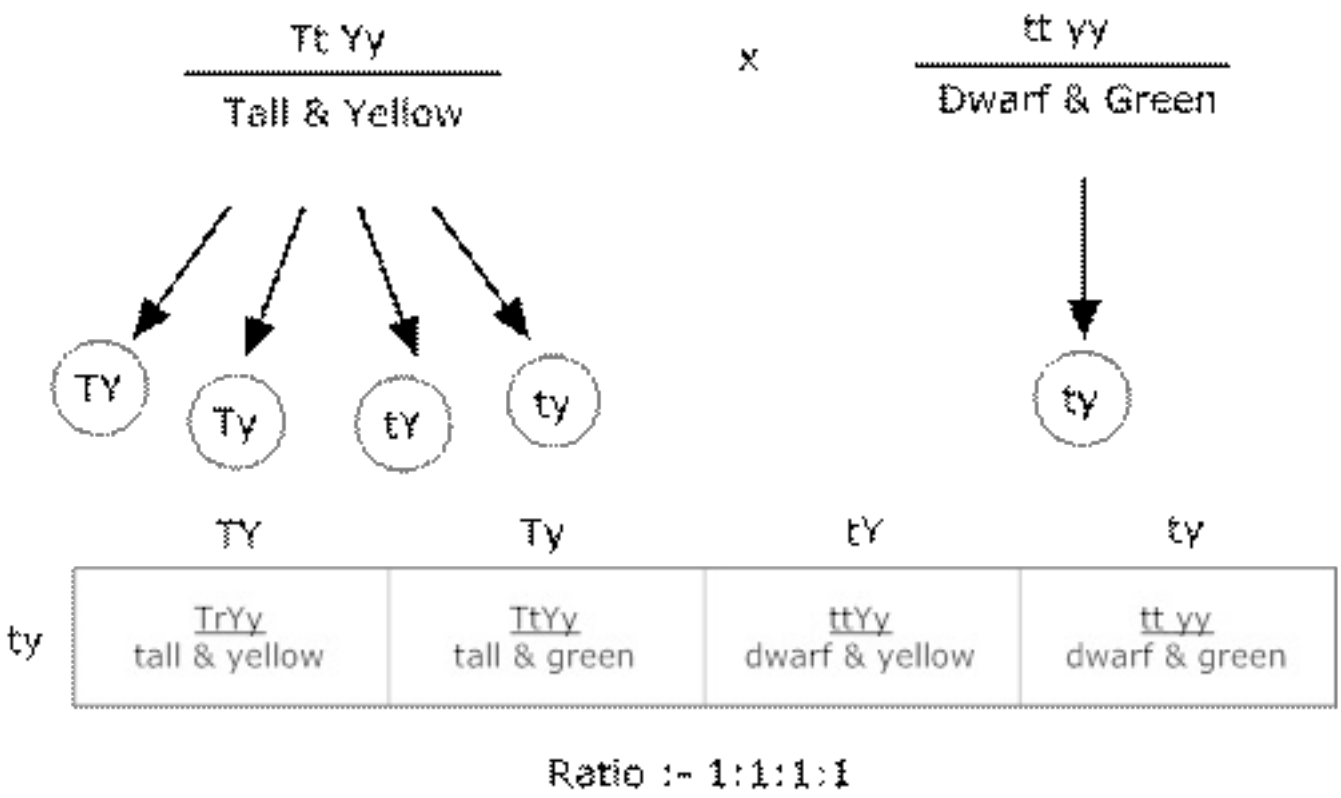
(i) What type of cross is this?

(ii) Work out the genotype & phenotype of progeny

(iii) What principle of Mendel is illustrated through result of this cross?

Ans. (i) Test cross.

(ii)



(iii) Principle of Independent Assortment – Acc to which, in the inheritance of contrasting characters the factors of each pair of character segregate independently of the factors of the other pair of characters.

CBSE Class 12 Biology
Important Questions
Chapter 6
Molecular Basis of Inheritance

3 Marks Questions

1. Give six points of difference between DNA and RNA in their structure/chemistry and function.

Ans.

DNA	RNA
(i) Double stranded molecules (ii) Thymine as pyrimidine base (iii) Pentose sugar is Deoxyribose (iv) Quite stable and not very reactive (v) Dictates the synthesis of Polypeptides (vi) Found in the nucleus.	(i) Single stranded molecules (ii) Uracil as pyrimidine base (iii) Sugar is Ribose (iv) 2´-OH makes it reactive (v) Perform their functions in protein synthesis. (vi) They are transported into the cytoplasm.

2. Explain how does the hnRNA becomes the mRNA. OR Explain the process of splicing, capping and tailing which occur during transcription in Eukaryotes.

Ans.hnRNA is precursor of mRNA. It undergoes

(i) Splicing : Introns are removed and exons are joined together.

(ii) Capping : an unusual nucleotide (methyl guanosine triphosphate isadded to the 5´ end of hnRNA.

(iii) Adenylate residues (200-300) are added at 3´ end of hnRNA.

3. Name the three major types of RNAs, specifying the function of each inthe synthesis of polypeptide.

Ans. (i) mRNA-(Messenger RNA) : decides the sequence of amino acids.

(ii) tRNA-(Transfer RNA) : (a) Recognises the codon on mRNA (b) transport the aminoacid to the site of protein synthesis.

(iii) rRNA (Ribosomal RNA) : Plays the structural and catalytic role during translation.

---

4. Enlist the goals of Human genome project.

Ans. The Human Genome Project (HGP) is an international scientific research project with the goal of determining the sequence of chemical base pairs which make up human DNA, and of identifying and mapping all of the genes of the human genome from both a physical and functional standpoint

---

5. A tRNA is charged with the amino acid methionine.

(i) Give the anti-codon of this tRNA.

(ii) Write the Codon for methionine.

(iii) Name the enzyme responsible for binding of amino acid to tRNA.

Ans. (a) UAC **(b)** AUG **(c)** Amino-acyltRNAsynthetase.

---

6. Illustrate schematically the process of initiation, elongation and termination during transcription of a gene in a bacterium.

Ans. In bacteria, the mRNA provides the template, tRNA brings aminoacids and reads the genetic code, and rRNAs play structural and catalytic role during translation.
There is single DNA-dependent RNA polymerase that catalyses transcription of all types of RNA in bacteria.
RNA polymerase binds to promoter and initiates transcription (Initiation)
It somehow also facilitates opening of the helix and continues elongation
Once the polymerases reaches the terminator region, the nascent RNA falls off, so also the

RNA polymerase. This results in termination

7.What is transformation? Describe Grifith's experiment to show transformation? What did he prove from his experiment?

Ans. Transformation means change in genetic makeup of an individual. Fredrick Grifith conducted aseries of experiments on streptococcus pneumoniae. He observed two strains of this bacterium –one forming smooth colonies with capsule (s-type) & other forming rough colonies without capsule

(R-type)

(i) when live s-type cells are infected into mice, they produced pneumonia & mice dies.

(ii) When live R-type cells are infected into mice, disease was not produced did not appear.

(iii) When heat – killed S-type cells were infected into mice, the disease did not appear.

(iv) When heat killed S-type cells were mixed with live R-cells & infected into mice, the mice died.

He concluded that R-strain bacteria had somehow been transformed by heat –killed S-strain bacteria which must be due to transfer of genetic material

8.The base sequence on one strand of DNA is ATGTCTATA

(i) Give the base sequence of its complementary strand.

(ii) If an RNA strand is transcribed from this strand what would be the base sequence of RNA?

(iii) What holds these base pairs together?

Ans. (i) TACAGATAT.

(ii) UACAGAUAU

(iii) Hydrogen bonds hold these base pairs together. Adenine & thymine are bounded by

twohydrogen bonds & cytosine & Guanine are bonded by three hydrogen bonds.

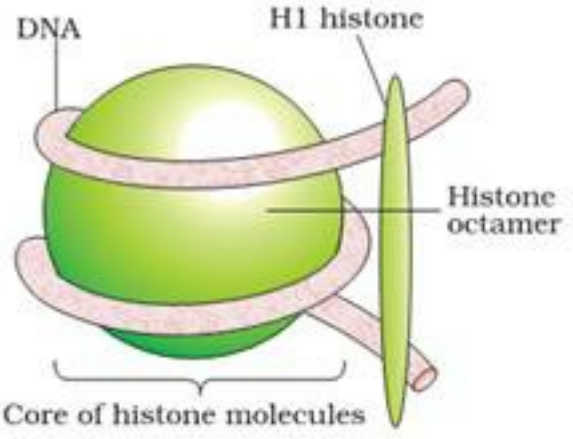
9.Two claimant fathers filed a case against a lady claiming to be the father of her only daughter. How could this case be settled identifying the real biological father?

Ans. This case to identify the real biological father could lee settled lay DNA – finger printingtechnique. In this technique :-

1. first of all, DNA of the two claimants who has to be tested is isolated.
2. Isolated DNA is then digested with suitable restriction enzyme & digest is subjected to gelelectrophoresis.
3. The fragments of ds DNA are denatured to produce ss DNA by alkali treatment.
4. The electrophoresed DNA is then transferred from get into a nitrocellulose filter paper where itis fixed.
5. A known sequence of DNA is prepared called probe – DNA & is labelled with radioactive esotope32p & then probe is added to nitrocellulose paper.
6. The nitrocellulose paper is photographed on X –ray film through auto radiography. The film isanalysed to determine the presence of hybrid nucleic acid.

Then, the DNA fingerprints of the two claimants is compared with the DNA fingerprint of the lady &her daughter, whosoever matches with each other would be declared as biological father of herdaughter.

10.The length of DNA in an eukaryotic cell is N 2.2 m How can such a huge DNA be packaged in a nucleus of micrometer in diameter.



Ans. In eukaryotes, the DNA is wrapped around positivelycharged histone octamer into a structure called nucleosome. Atypical nucleosome consists of 200bp of DNA helix. Thenucleosomes are the repeating units that form chromatin fibres.

These chromatin fibres condense at metaphase stage of celldivision to form chromosomes. The packaging of chromatin at higher level requires additional set ofproteins called non-histone chromosomal proteins thus in nucleus, certain regions of the chromatinare loosely packed & they Stain lighter than the other region, these are called euchromatin. Theother region are lightly packed & they stain darker & are called heterochromatin

---

11.A tRNA is charged with amino acid methionine.

i) At what site in the ribosome will the tRNA bind?

ii) Give the anticodon of this tRNA?

iii) What is the mRNA codon for methionine?

iv) Name the enzyme responsible for this binding?

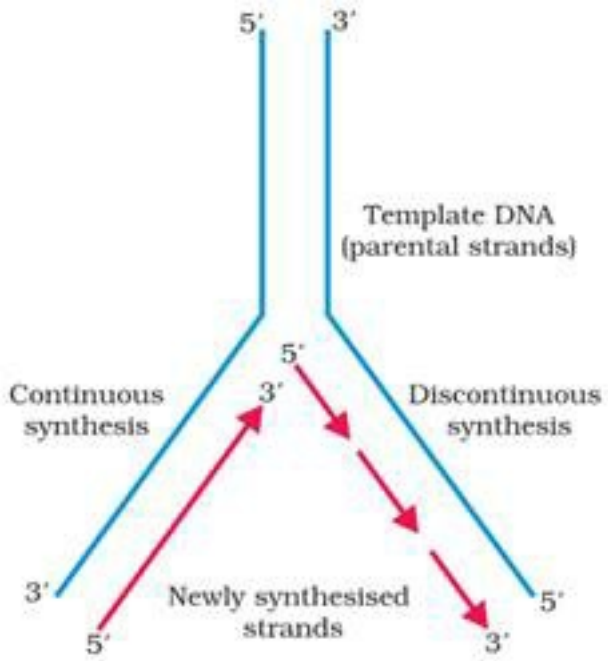
Ans. (i) P- site

(ii) UAC

(iii) AUG

(iv) Amino acyl tRNASynthetase

12.Describe the continuous & discontinuous Synthesis of DNA?



Ans. Synthesis of new strand of DNA takes place lay additionof fresh nucleotides to the 3 – OH group of the last nucleotideof the primer. This synthesis takes place in 5 direction&enzyme that catalyses this is DNA – polymerase

∴ synthesis of strand called leading strand iscontinuous.

The replication of second strand of the DNA molecule is

DISCONTINOUS on strand called lagging strand.

Primase initiates primer synthesis on strand near the fork. The RNA – primer thus formedprovides free for replication of single stranded region on lagging strand the newcomplementary strand is formed in small fragments of DNA called Okazaki fragments. It is calleddiscontinuous because it has to be initiated several times & every time an Okazaki fragment isproduced.

13.What are the three types of RNA & Mention their role in protein Synthesis?

Ans. There are three types of RNA :

1. Messenger RNA (mRNA) :- It is a single – stranded RNA which brings the genetic information ofDNA transcribed on it for protein synthesis.
2. Transfer RNA (tRNA) :- It has a clover leaf like structure which acts as an adapter

moleculewhich contains an “anticodon loop” on one end that reads the code on one hand &” an amino acid acceptor end which binds to the specific amino acid on other hand.

3. Ribosomal RNA (rRNA) :- Ribosomes provides the site for synthesis of protein &catalyse theformation of peptide bond.

---

14. Define bacterial transformation? Who proved it experimentally & how?

Ans. The transformation is a mode of exchange or transfer of genetic information betweenorganism or from one organism to another.

Fredrick Griffith tested the virulence of two strains of Diplococci to show transformation in thefollowing steps :-

1. When S-III strains of bacteria are injected into mice. It developed pneumonia & died.
2. When R-II strains are infected into mice, they did not develop pneumonia & survive.
3. When heat – killed S-III strains of bacteria are injected into mice, No symptoms of pneumoniadevelops& mice remain healthy.
4. When a mixture of heat – killed S-III strain & lives R-II strain is injected into mice, theydeveloped pneumonia & died.

From these results, Griffith concluded that the presence of heat – killed S-III bacteria must convertliving R-II type bacteria to type S-III so as to restore them the capacity for capsule formation. Thiswas called “BACTERIAL TRANSFORM ATION”

S strain $\rightarrow$ Inject into mice $\rightarrow$ Mice die

R strain $\rightarrow$Injct into mice $\rightarrow$ Mice live

S strain (heat-killed)$\rightarrow$ Inject into mice $\rightarrow$ Mice live

S strain (heat-killed) + R strain (live) $\rightarrow$ Inject into mice $\rightarrow$Mice die

CBSE Class 12 Biology
Important Questions
Chapter 7
Evolution

1 Marks Questions

1.Name one fish like reptile that evolved from land reptile about 200 million years ago?

Ans. Ichthyosaurs.

2. For a long time, it was believed that life originated from decaying matter. What is this theory known as? Name the scientist who experimentally disproved this theory.

Ans. Theory of Spontaneous generation; Louis Pasteur.

3. If abiotic origin of life is in progress on a planet other than earth, what should be the conditions there?

Ans. Very high temperature, volcanic storms, Reducing atmosphere containing CH4, NH3, H2 and water vapours.

4. Name the person who proposed that population tends to increase geometrically while food production increases arithmetically.

Ans. Thomas Malthus

5. Name the scientist who had also come to similar conclusion as that of Darwin about natural selection as a mechanism of evolution. Which place did he visit to come to conclusions?

Ans. Alfred Wallace, Malay Archipelago

6.Name any two vestigial organs found in human body?

Ans. Vermiform appendix, wisdom teeth.

7.What is the cause of speciation according to Hugo De Vries?

Ans. Mutations.

8.Name the phenomenon by which rapid speciation takes place?

Ans. Genetic Drift.

9.Name the two scientists who set up a special experiment to prove Oparin's theory of origin of life?

Ans. Urey & Miller.

10.Name the common ancestor of apes & man?

Ans. Dryopithecus.

11.Which period is known as "Age of amphibians"?

Ans. Carboniferous period.

12.What provided energy for a biotic synthesis on primitive earth?

Ans. Very high temperature due to lightening or uv – rays provided energy for a biotic synthesis.

13.Who showed that life comes from pre-existing life?

Ans. Louis Pasteur

14.What is meant by Gene pool?

Ans. Gene pool refers to sum total of different kinds of genes pooled by all the members of a

population.

15.Which period is called “Age of Reptiles”.

Ans. Jurassic period.

16.Name the species of human beings which is most closely related to modern man.

Ans. Cro-magnon.

17.What is “Founder’s effect”?

Ans. Sometime a change in allele frequency is so different in new sample of population that they become a new species in such cases original drifted population becomes founder & this effect is called Founder’s effect.

CBSE Class 12 Biology
Important Questions
Chapter 7
Evolution

3 Marks Questions

1. (i) State the Hardy-Weinberg principle.

(ii) When there is a disturbance in the Hardy-Weinberg equilibrium, what would it result in?

(iii) According to this principle, what is the sum total of all allelic frequencies?

Ans. (i) The allele frequency in a population are stable and constant from generation to generation.

(ii) Evolution.

(iii) One.

---

2. Classify the following as examples of homology and analogy

(i) Hearts of fish and crocodile

(ii) Wings of butterfly and birds

(iii) Eyes of Octopus and Mammals

(iv) Tubers of potato and Sweet potato

(v) Thorns of Bougainvillea and spines of Opuntia

(vi) Thorn of Bougainvillea and tendrils of cucurbits.

Ans. (i) Homology **(ii)** Analogy **(iii)** Analogy **(iv)** Analogy **(v)** Analogy **(vi)** Homology

---

3. Stanley Miller and Harold Urey performed an experiment by recreating in the

laboratory the probable conditions of the atmosphere of the primitive earth.

(i) What was the aim of the experiment?

(ii) In what forms was the energy supplied for chemical reactions to occur?

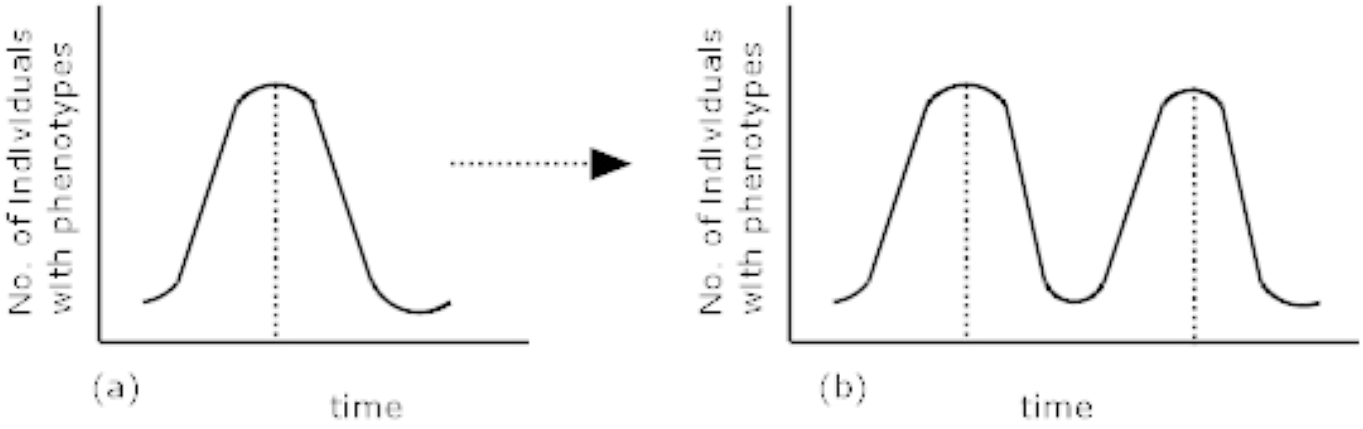
(III) For how long was the experiment run continuously? Name two products formed.

Ans. (i) To prove Oparins theory of origin of life.

(ii) Electric discharge using electrodes.

(iii) One week; Amino acids and Sugar.

4.Study the figures given below & answer the following question.



i) Under the influence of which type of natural selection would graph (a) become like graph (b).

ii) What could be the likely reason of new variations arising in a population.

iii) Who suggested natural selection as mechanism of evolution?

Ans. (i) Disruptive & elective.

(ii) Because individuals at the extremes contribute more offspring compared to those in the centre&produces two peaks in distribution of a trait.

(iii) Charles Darwin.

---

5. Fill up the blanks left in the table showing Era, period and organism.

Era	Period	Organisms
Cenozoic	A	Modern man, mammals, birds, rise fo monocot
B	Tertiary	Rise of first Primate, angiosperm
Mesozoic	C	Gingko, Gnetales
D	Jurassic	Conifers, cycads, Reptiles
Paleozoic	E	Early reptiles (extinct)
F	Silurian	Psilophyton

Ans. (a) Quaternary (b) Coenozoic (c) Cretaceous

(d) Mesozoic (e) Carboniferous (f) Paleozoic

6. (i)In which part of the world, Neanderthal man lived?

(ii)What was his brains capacity?

(iii)Mention the advancement which Neanderthal man showed over Homoerectus.

Ans.(i) Near Eastern and Central Asia

(ii) 1400 c.c.

(iii) More brain capacity, use of hides to cover body and burial of dead.

7. Figures given below are of Darwins finches?

Variety of beaks of Darwin's finches.

(a) Mention the specific geographical area where these were found.

(b) Name and explain the phenomenon that has resulted in the evolution of such diverse species in the region.

(c) How did Darwin visit the particular geographical area?

Ans. (a) Galapagos Island.

(b) Adaptive radiation - The process of evolution of different species in a given geographical area starting from a point and literally radiating to other areas of geography (habitats) is called adaptive radiation.

(c) Through sea voyage in a sail ship called H.M.S. Beagle.

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8. Give examples to show evolution by anthropogenic action.

Ans. Excess use of herbicides pesticides etc. has resulted in selection oresistent varieties in a much lesser time scale. Same is true for antibiotic or drug resistant microbes.

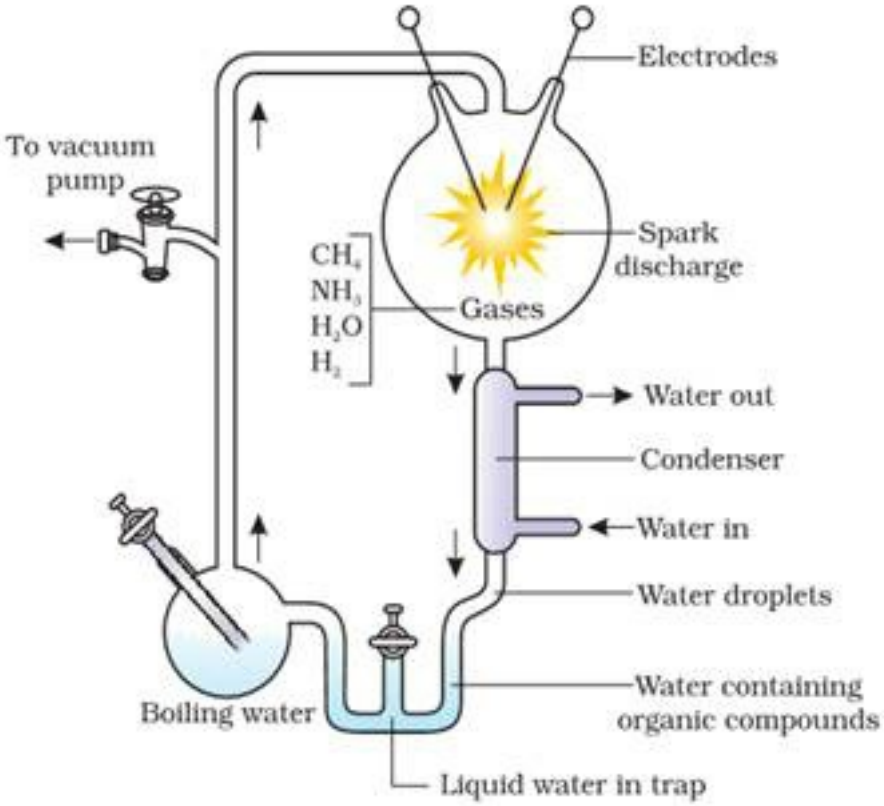
9.By taking industrial melanism as on example, explain the concept of natural selection by evolution?

Ans. Theory of natural selection states that due to survival of fittest, the species change readilyowing to preservation & transmission of minute variation & gradually give rise to new forms.

Example – In collection of moths in 1850 it was observed that there were whiter winged moth than dark winged but after industrialization there were darker wringed moth. This is due to the reason that During post industrial period trees trunk become dark due to industrial smoke under this condition, white winged moth do not survive due to predators dark winged moth survived Before industrialization sets in, thick growth off white colored lichen covered trees in that background white winged moth survived but dark – colored moth were picked out by predators hence nature selects which species is suitable.

10.Who were the two scientists that conducted an experiment to synthesise organic

molecule abiotically? How did they provide the probable condition of the primitive earth in this experiment?



Ans. Urey & miller tried to create in the laboratorythe similar conditions which might have existedin early primitive atmosphere. A mixture of watervapours methane, ammonia & hydrogen is exposedto electric discharge in a closed chamber, this fluidthus formed is allowed to stand for several week as aresult, amino acids e.g. glycerine& alanine areformed from fluid. They suggested that electric discharge produced during lightening in primitiveatmosphere of earth might have resulted in formation of organic compound.

11.What is Biogenetic law? How does comparative embryology provides evidences for evolution?

Ans. It has become evident from embryological studies that there was one developmental pattern.

In all organisms life begins with a unicellular structure. The embryo of fish, frog, turtle, bird & manresembles one another so closely that it becomes difficult to distinguish them. Mammalian embryoparses through fish – like, amphibian-like, reptiles like & bird like stages

during development of anorganism (ontogeny), some of the evolutionary steps (phylogeny) are repeated in different group oforganism. This leads Ernst Haeckal to formulate famous theory – "RECAPITULATION THEORY /

BIOGENETIC LAW.Which states that "Ontogeny recapitulates phylogeny" The sequence ofembryonic development shows striking similarity e.g. appearance of gill cleft and notochord inembryonic development of all vertebrates from fish to man.

12.Chemical insectides remain useful only for a limited time. Explain with reference to evolution with a suitable example.

Ans."Chemical insectides remain useful only for a limited time" because of the phenomena ofnatural selection with the course of time when chemical insecticides are excessively used to killinsects, some of the resistant varieties of the organism would have been created which are notkilled lay the insect icicle such resistant varieties of the unseats are selected lay nature & theymultiply after sometime population of this resistant variety increases & the chemical insecticidewould lee ineffective to control these insects for example DDT is a common insecticide formosquitoes lout is now ineffective because DDT – resistant mosquitoes have appeared & selected innature.

13.What are the facts that support Darwin's theory of Natural selection?

Ans. The following facts that supports Darwin's theory of Natural selection

1. Overproduction: - All organisms tend to multiply at high rate but it is not possible for allorganisms to survive.
2. Struggle for Existence: - Because of limitation of space & food all the offspring of the result ofoverproduction will not survive & they will compete with one another to grow this develops struggle for existence not only among individuals of different species but also among same species.
3. Variations :- No two individuals of same species are exactly alike even coming out from sameparent al stock.
4. Survival of fittest :- The individuals with useful variation will survive during struggle of existencewhile those with less fortunate variation would perish.

14.Trace the important events or stages of human development?

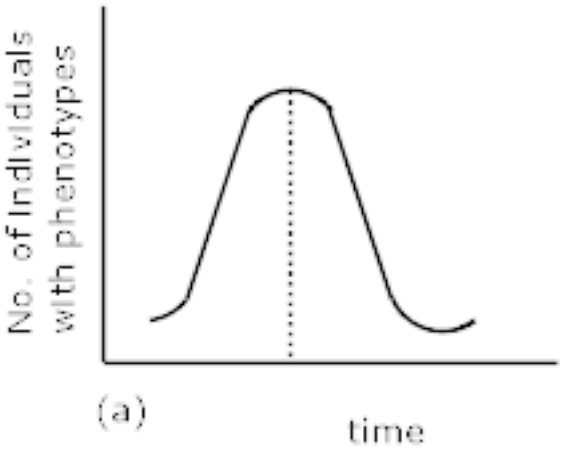
Ans. The common ancestor of apes & man is a primate Dryopithecus that lived about 15 millionyears ago the human evolution is as follows :-

1. Australopithecus :- They are 4ft, with brain capacity – 500 to 650 cc. They have bipedal locomotion, omnivorous &has erect posture. They hunted with stone weapon & lived in caves.
2. Homo Erectus :- They showed increase in brain size They are good hunters, ate meat domesticate animal & discover fire.
3. Netherlands man :- They were short with heavy brows retreating forehead large jaws & stooped postures They wore clothes, good hunters & tool makers.
4. Cromagnonman :- They were completely erect & 6ft tall. He used bones as tools & was a cave dweller. They are excellent tool makers & fine artists.
5. Homo sapiens :- They have brain capacity 1450cc. & skull much thicker. His intelligence has enabled him to adapt & control environment. He started agriculture.

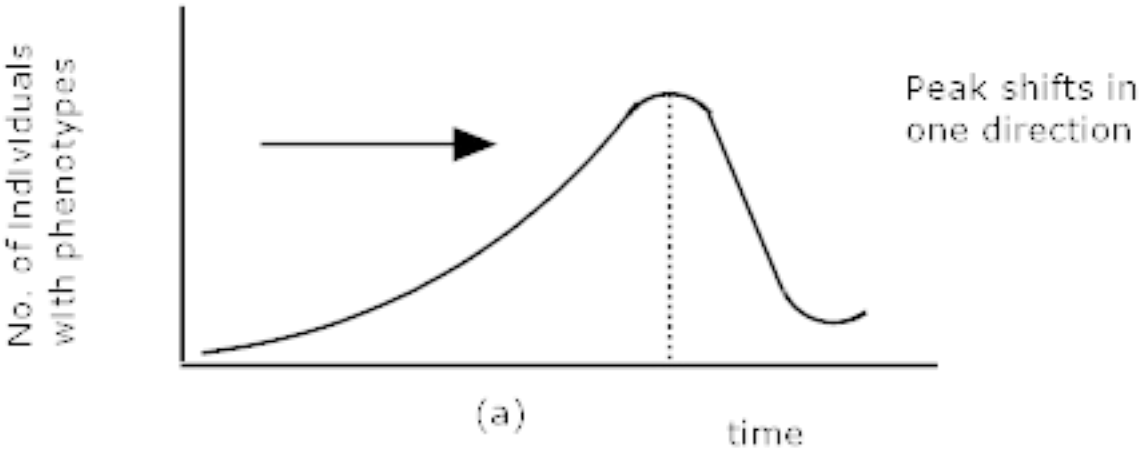
15.What are the three different ways in which selection may occur.

Ans. The three different ways in which selection may occur are as below:-

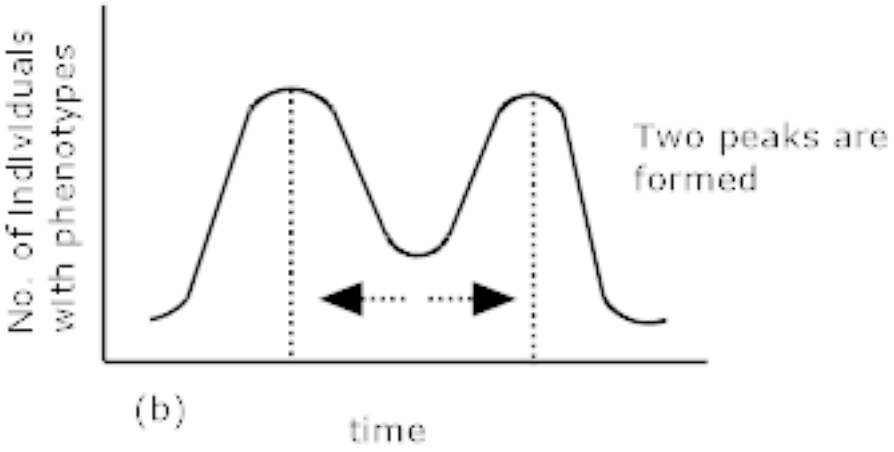
(i) StablisingSelection :- Individuals with intermediate value of heritable phenotypic characteristics are favoured over other individuals.



(ii) Directional Selection :- Individuals with one extreme of heritable phenotypic characteristic have an advantage over individuals in a population.



(iii) Disruptive Selection :- individuals with either of both extreme of heritable phenotypic characteristics have advantage over individuals with intermediate phenotype.



16.State in what ways Stanley miller simulated the condition of :-

i) Primitive atmosphere on earth.

ii) Energy source at the time of origin of life .

iii) Formation of organic molecule of life.

Ans. i) A fluid containing mixture of methane, ammonia, hydrogen & water vapour in a closed flask.

ii) Energy source during origin of life was sun. This energy in the experiment is provided lay electricdischarge using electrode.

iii) Organic molecules formed during experiment are amino acids.

17.What is Biogeography? How Darwin's finches provide biogeographical evidence in favour of evolution.

Ans. The branch of geography which deals with the study of pattern of distribution of plants &animals in different parts of earth is called Biogeography.

Example Galapagos islands – group of 14 islands in Pacific Ocean on west coast of South America.Charles Darwin during his voyage found that animals of these is lands resembles with those of SouthAmerican is lands. E.g. birds of Galapagos Island called Darwin's finches do not resemble birds ofSouth America so he concluded that finches were derived from ancestral stock that had emigratedfrom mainland to island & has undergone profound changes under environmental conditions.

18. How did louispasteur successfully demolish the popular theory of spontaneous generation?

Ans. Louis Pasteur used a special swam-necked flask for his experiment. He took mixture of sugar &yeast powder & filled about half of it with water in this flask. He then boiled the content of flask till asteady current of steam rushed out from s-shaped tube –causing death of all microorganisms. Afterthis flask remains unchanged. But when neck of flask was cut-off showed thick growth ofmicroorganisms this is presumed that are contains microorganisms which in first case could notreach the flask whereas in second case they comes in direct contact with solution.

CBSE Class 12 Biology
Important Questions
Chapter 1
Reproduction in Organisms

2 Marks Questions

1. Higher organism have resorted to sexual reproduction inspite of its complexity. Why?

Ans. Because of variations, gene pool, Vigour and Vitality and Parental care.

2. Tapeworms posses both male and female reproductive organs. What is the name given to such organism? Give two more examples of such organisms.

Ans. Hermaphrodite; Examples : Earthworm, Leech.

3. Study the relationship between first two words and suggest a suitable word for fourth place.

(a) Male flower : Stamens :: Female Flower : .....
(b) Birds : oviparous :: Primates : .....
(c) Chlamydomonas : Zoospores :: Penicilium : .....
(d) Ginger : Rhizome :: Agave : .....

Ans. (a) Carpel **(b)** Viviparous
(c) Conidia **(d)** Bulbil

4. Bryophytes and Pteridophytes produce a large number of male gametes but relatively very few female gametes. Why?

Ans. Because male gemete need medium (water) to reach egg/female gamete.A large number of the male gametes fail to reach the female gamete.

5. Enlist the significance of reproduction.

Ans. Significance of reproduction includes:

- Propagation of species.
- Sustenance of life on this planet.
- Variation introduced during reproduction plays a role in evolution of new species.

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6. Why do hilly areas of Kerela, Karnataka and Tamil Nadu transform into blue stretches that attracts many tourists?

Ans. *Strobilanthus kunthiana* which flowers only once in every 12 years flowered in 2006 that resulted into transformation of the hilly tracks of Kerela, Karnataka and Tamil Nadu into blue stretches.

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7. Define 'oestrus' and 'menstrual' cycles.

Ans. Non- Primates like cows, sheep etc. show certain cyclic changes during reproduction called oestrus cycle while Primates like apes, humans the cycle is referred to as menstrual cycle.

8.What regulates the reproduction processes and the associated behavioural expressions in organisms?

Ans. Interaction between hormones and certain environmental factors regulate the reproductive processes and the associated behavioural expressions of organisms.

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9. Mention the different stages of sexual reproduction.

Ans. The different stages in sexual reproduction include:

- Pre- fertilization events.
- Fertilization.
- Post – fertilization events.

CBSE Class 12 Biology
Important Questions
Chapter 1
Reproduction in Organisms

3 Marks Questions

1. Mention the site of zygote formation in the ovule of a flowering plant. What happens to sepals, petals and stamens after fertilisation? State the fate of zygote, ovule and ovary in these plants.

Ans. Embryo sacSepals, Petals and Stamens dry and fall off. Zygote develops into embryo. Ovule develops into seed and ovary into fruit.

2. Distinguish between gametogenesis and embryogenesis.

Ans.

Gametogenesis	Embryogenesis
1. Formation of gametes 2. Produces haploid gametes 3. Cell division is meiotic	1. Formation of embryo 2. Embryo is diploid 3. Cell division is mitotic.

3. Fill the blank spaces a, b, c, and d given in the following table.

Ans.

Organism	Organ	Gamete
a Human female Plant (Angiosperm) Plant (pteridophytes)	Testes b c antheridium	Spermatozoa Ovum Pollen grains d

a = Human male b = ovary

c = Anther d = Antherozoid

4. What are heterogametes? What do we call these gametes individually?

Ans. Most of the sexually reproducing organisms produce two morphologically distinct gametescalled heterogametes.

The male gamete is called antherozoid or sperm and the female gamete is called egg or ovum.

5. Why is syngamy a major event in sexual reproduction?

Ans. The fusion of the male gamete with the female gamete is called syngamy or fertilization andplays and important role in exchange of genetic material to introduce variation and results intoformation of diploid zygote.

6.What happens during embryogenesis?

Ans. Embryogenesis is the development of the embryo. The zygote undergoes mitotic cell division to increase the number of cells. It is followed by cell differentiation where the cells undergo certain modifications to form the specialized tissues and organs to form the organism.

7.Give any three differences between asexual and sexual reproduction.

Ans.

ASEXUAL REPRODUCTION	SEXUAL REPRODUCTION
1. There is involvement of only one individual.	1. Two sexually distinct individuals are involved.
2. There is no formation of gamete.	2. There is formation of gametes.
3. Syngamy and zygote formation is	

absent.	3. Syngamy and zygote formation take place.

8.Enlist the changes that occur post- fertilization in plants.

Ans. The various post- fertilization changes as observed in plants are

- The sepals, petals and stamens wither away.
- The pistil remains attached to the plant.
- The zygote develops into embryo, ovary develops into fruit and the ovules develop into seeds.

9. (a) Distinguish between asexual and sexual reproduction. Why isvegetative reproduction also considered as a type of asexual reproduction?

(b) Which is better mode of reproduction : Sexual or Asexual? Why?

Ans. (a)

Asexual Reproduction	Sexual Reproduction
(i) Uniparental (ii) Gametes are not involved (iii) Only mitotic division takes place (iv) Offspring genetically similar to parent	(i) Biparental (ii) Gametes are involved (iii) Meiosis at the time of gamete formation and mitosis after fertilisation (iv) Offspring different from parent.

Vegegative propagation takes place when new individuals arise from vegetative part of parent and have characters similar to that of parent plant.

(b) Sexual reproduction introduces variations in offsprings and has evolutionary significance. It helps offsprings to adjust according to the changes in environment. It produces better offsprings due to

Character combination.

CBSE Class 12 Biology
Important Questions
Chapter 2
Sexual Reproduction in Flowering Plants

2 Marks Questions

1. In angiospermic plant before formation of microspore sporogenous tissue undergo cell division

(a) Name the type of cell division.

(b) What would be the ploidy of the cells of tetrad?

Ans. (a) meiosis division (b) haploid

---

2. Outer envelop of pollen grain made of a highly resistant substance. What is that substance? At which particular point the substance is not present?

Ans. Sporopollenin; at germpore sporopollenin is absent.

---

3. Fruits generally develops from ovary, but in few species thalamus contributes to fruit formation.

(a) Name the two categories of fruits.

(b) Give one example of each.

Ans. Two categories of fruits are

(i) True fruits e.g., Mango

(ii) False fruit e.g., Apple

---

4. Among the animal, insects particularly bees are the dominant pollinating agents. List any four characteristic features of the insect pollinated flower.

Ans. i. Flowers are large.

ii. Colorful petals of flower.

iii. Presence of fragrance.

iv. Rich in nectar.

5. Differentiate between geitonogamy and xenogamy.

Ans.

Geitonogamy	Xenogamy
1. Transfer of pollen grains from the another to stigma of another flower of the same plant	1.Transfer of Pollen grains from another to stigma of defferent plant.
2. Does not provide opportunity for gametic recombination.	2.Provide opportunity for gametic recombination.

6. In the given figure of a dicot embryo, label the parts (A) and (B) and give their function.

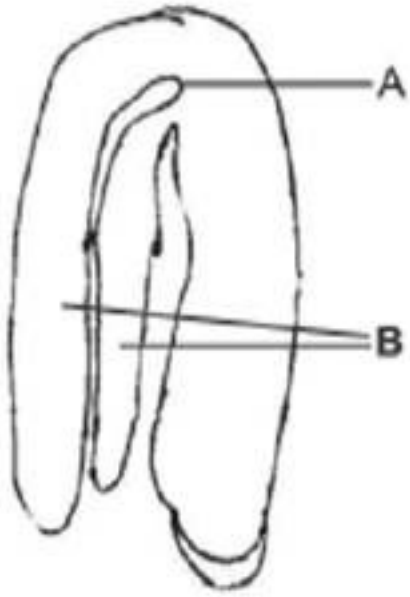


Figure 1

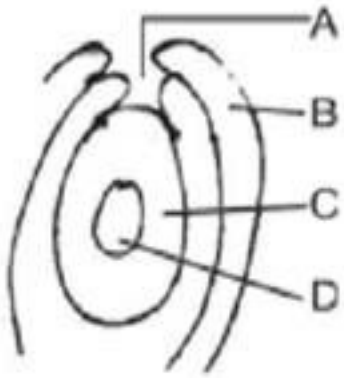


Figure 2

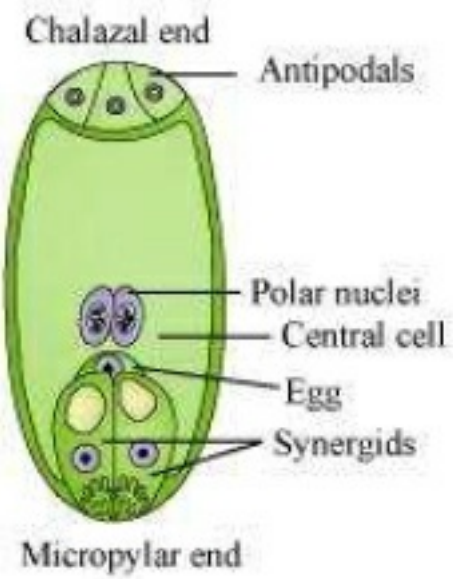
Ans. A = Plumule To form shoot system

B = Cotyledons Storage of food

7. Name the parts A, B, C and D of the anatropous ovule (Figure 2) given above.

Ans. A = Micropyle, B = Outer integument, C = Nucellus, D = Emnbryo sac

8. Given below is an incomplete flow chart showing formation of gamete in angiospermic plant. Observe the flow chart carefully and fill in the blank A, B, C and D.



Ans. A = Ovule/megasporangium, C = Tapetum

B = Megaspore mother cell, D = Pollen grains

9. Name the blank spaces a, b, c and d is the table given below : Item What it represents in the plant

(i) Pericarp a

(ii) b Cotyledon in seeds of grass family

(iii) Embryonal axis c

(iv) d Remains of nucellus in a seed.

Ans. a = wall of fruit, b = scutellum, c = shoot and root tip, d = perisperm

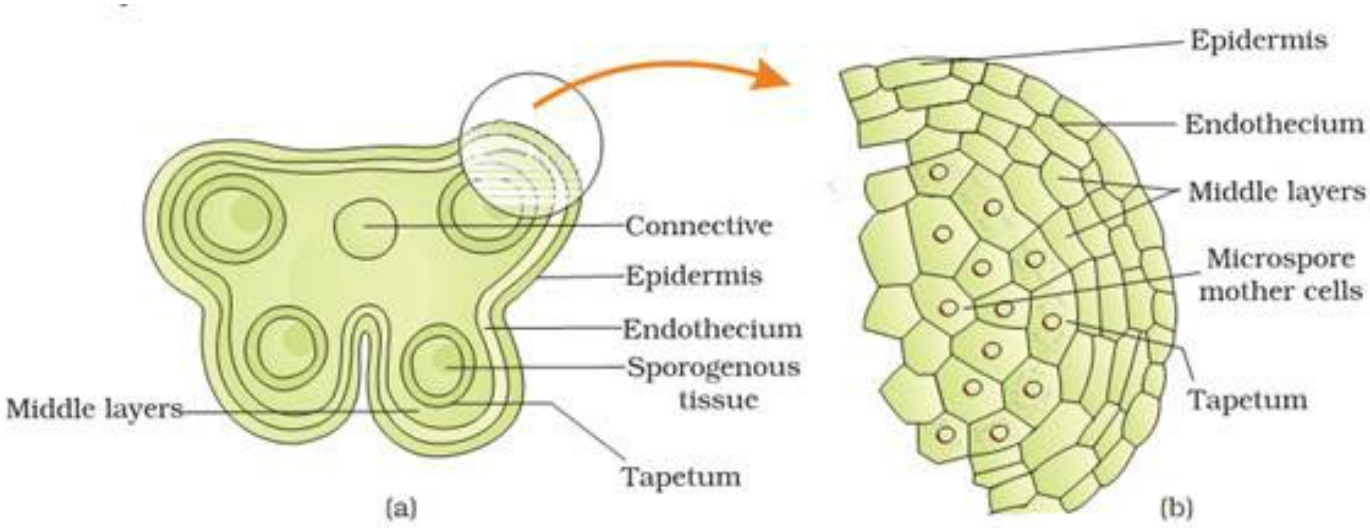
10. Even though each pollen grain has two male gametes. Why are at least 10 pollen grains and not 5 pollen grains required to fertilise 10 ovules present in a particular carpel?

Ans. Because only one male gamete is involved in syngamy. ie fursionof male gamete with egg cell.

11. Describe the structure of a microsporangium with a neatly labeled diagram.

Ans. The structure of the microsporangium is as follows:

- It is almost circular with four wall layers.
- The outer three layers: epidermis, endothecium and middle layers are protective in function and help in dehiscence of anther to release pollen grains.
- The inner tapetum nourishes the developing embryo. Sporogenous tissue occupies the central position.



12. Why pollen grains can remain well preserved as fossils?

Ans. Pollen grains are well preserved as fossils because the exine of the pollens is composed of a chemical, sporopollenin which can withstand high temperature, strong acids and alkalies and strong enzymes

13. How are the cells arranged in an embryo sac?

Ans. An embryo sac is a 7 celled and 8 nucleated structure. At the micropylar end is present a group of three cells; two synergids and one egg cell. The chalazal end consists of three cells called antipodals. There is a central cell with two polar nuclei.

14. Why are cleistogamous flowers invariably autogamous?

Ans. In a cleistogamous flower, the flower never opens and when the anther dehisce in the bud the pollen grains fall on the stigma of the same flower and thus it is strictly autogamous.

15. State any one advantage and disadvantage of pollen grains to humans.

Ans. Advantage: Pollen grains are rich in nutrients and therefore in the western world pollen tablets are used as food supplements. Disadvantage: Pollens of many species cause severe allergies and bronchial afflictions leading to chronicle respiratory disorder.

16. State the characteristics of insect pollinated flowers.

Ans. The characteristics of an entomophilous flower include:

- Petal and sepals well developed with attractive colours to invite insects.
- Flowers are normally bigger in size with strong odour.

17. Differentiate between chasmogamous and cleistogamous flowers

Ans.

Chasmogamous flower.	Cleistogamous flower.
1. The flowers are conspicuous. The anthers and the stigmas are exposed.	1. The flowers are small and inconspicuous. The anthers and stigmas are never exposed.
2. Both self and cross pollination can occur.	2. Only self pollination is possible.

18. Which type of pollination ensures the arrival of genetically different pollen grains

to stigma?

Ans. In xenogamy pollens from a different plant of the same species pollinate the stigma and thus ensure the arrival of genetically different types of pollen grains on to the stigma.

19. What relationship exists between a species of moth and Yucca plant?

Ans. There exists a relationship between moth and *Yucca* plant. The moth deposits its egg in the locule of the ovary and in turn pollinates the flower of the plant. The larvae develop from the eggs as the seeds start developing.

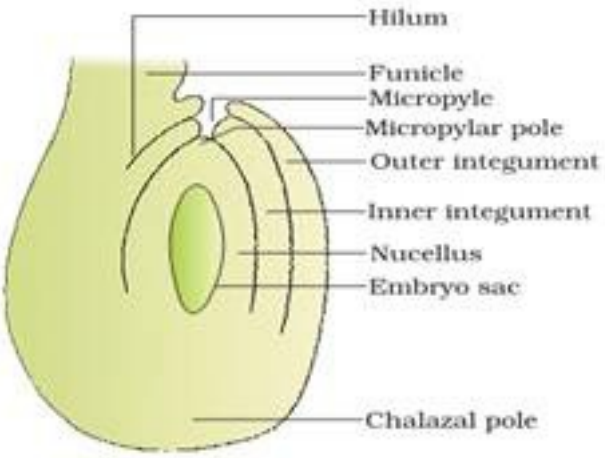
20. Differentiate between Geitonogamy & Allogamy.

Ans.

GEITONOGAMY	ALLOGAMY
i) It takes place between anther & pistil of different flowers of same plant.	i) It takes place between two flowers of two different plants of same species.
ii) Bisexual flower are essential for geitonogamy	ii) Unisexual flowers are essential for Allogamy.
iii) Progenies do not show variation & are genetically pure	iii) Progenies shows variations & are genetically impure

21. Draw a diagram of L.S. of an anatropous ovule of an Angiosperm & label the following parts :-

(i) Nucellus
(ii) Integument
(iii) Antipodal cells
(iv) Secondary Nucleus.
Ans.



22. Why is process of fertilization in flowering plants referred to as double fertilization?

Ans. In flowering plants, the first male nuclei fuses with egg to form a diploid zygote & Second male nuclei fuses with Secondary nucleus to give rise to primary endosperm nucleus – thus process of fertilization twice in an embryo sac. & therefore called DOUBLE FERTILISATION.

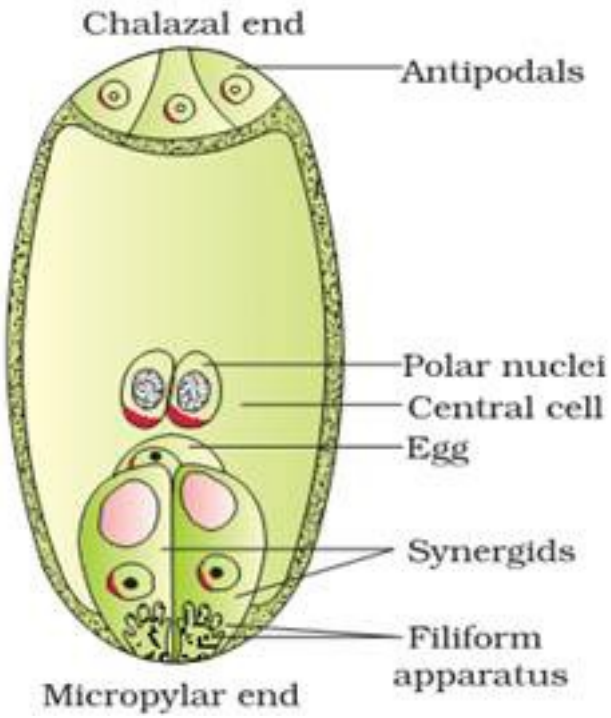
23.What are cleistogamous flowers? Can cross – pollination occurs in cleistogamous flowers. Give reason?

Ans. In some Angiospermic plants eg. Commelina, Oxalis etc, flowers are bisexual & they never open. This condition is called cleistogamy & flowers are called cleistogamous cleistogamous flowers are self – Pollination & to ensure this they never open Hence, cross pollination is not possible.

24. Draw a labeled diagram of mature embryo sac & label the following

i) Egg cell ii) Antipodal cells iii) Synergids iv) Polar nuclei

Ans.



25. Mention two strategies evolved lay flowers to prevent self-pollination

Ans. Two strategies evolved lay flowers to prevent self-pollination

(i) Dichogamy – In this, two reproductive organs of a bisexual flower matures at different time

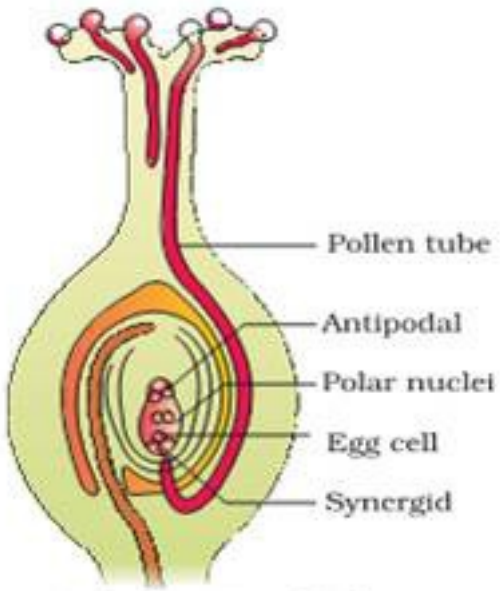
(ii) Self – sterility:-Pollen grains are unable to germinate on stigma of same flower or flower of same plant.

26. What is apomixis? What is its importance?

Ans. The development of reproductive propagules without meiosis & syngamy is called apomixis. It is also called asexual reproduction. It is a method of reproduction which produces new individuals with the help of vegetative part of plant body.

27. Draw a well labeled diagram of longitudinal section of pistil showing pollen germination?

Ans.



Longitudinal section of a flower showing growth of pollen tube

(c)

28. List the advantages of pollination to angiospermic plants?

Ans. Pollination leads to fertilization & production of seeds & fruits which are necessary for continuity of life.

i) It is important for new varieties of plants.

ii) It is important for production of hybrid seeds.

iii) It helps in genetic recombination in plants.

CBSE Class 12 Biology
Important Questions
Chapter 3
Human Reproduction

1 Marks Questions

1. Failure of testes to descend into scrotal sacs leads to sterility. Why?

Ans. High temperature of abdomen kills the spermatogenic tissue of the testes, so no sperm are formed.

2. Both vaccine and colostrum produce immunity. Name type of immunity produced by these.

Ans. Vaccine Active immunity Colostrum Passive immunity.

3. How many sperms will be produced from 10 primary spermatocytes and how many eggs will be produced from 10 primary oocytes?

Ans. 40 sperms, 10 eggs.

4. The spermatogonial cell has 46 chromosomes in human male. Give the number of chromosomes in

(a) Primary spermatocyte (b) Spermatid

Ans. (a) 46 in Primary spermatocyte

(b) 23 in spermatid.

5. In ovary which structure transforms as corpus luteum and name the hormone secreted by corpus luteum?

Ans. Follicular cells of empty Graafian follicle.

Progesterone.

6. "Each and every coitus does not results in fertilisation and pregnancy". Justify the statement.

Ans. Ovum and sperm should reach simultaneously to the ampullary – isthmic junction.

7. Why are male testes located outside the abdominal cavity?

Ans. The male testes are located in the scrotum outside the abdominal cavity as the scrotum provides low temperature than the normal body temperature required for spermatogenesis.

8. State the function of leydig cells.

Ans. The leydig cells synthesise and secrete testicular hormones called androgens.

9. Where do we find fimbriae?

Ans. Fimbriae are finger like projections found in the edges of the infundibulum.

10. What is semen?

Ans. The seminal plasma along with the sperms constitutes semen.

11. Define parturition.

Ans. The vigorous contraction of the uterus that results into the delivery of the child at the end of pregnancy is called parturition.

12. Where does fertilization normally takes place in a human female.

Ans. Ampulla (fallopian tube).

13. Name the substance present in the sperm acrosome & which help in sperms entry into egg.

Ans. Acrosome contains enzymes e.g. hyaluronidase that helps in dissolving membrane of ovum.

14. Name the layer of cells that forms the outer wall of blastocyst.

Ans. Trophoblast.

15. At what stage is the mammalian embryo implanted in uterus?

Ans. Blastocyst stage.

16. Despite the presence of So many sperms in the vicinity of an egg cell, only one sperm enters the ovum. Why?

Ans. Because when a sperm comes in contact with ovum (zona pellucida) & induces changes in membrane to block entry of other sperms.

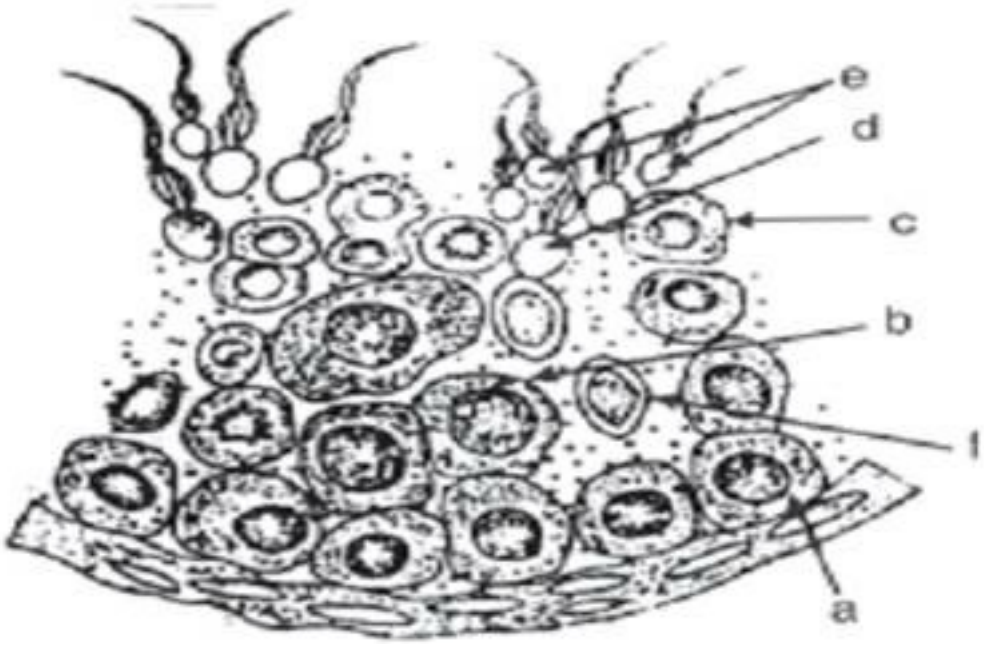
17. How many polar bodies are given out in production of one egg during cogenesis?

Ans. Two polar bodies

CBSE Class 12 Biology
Important Questions
Chapter 3
Human Reproduction

5 Marks Questions

1.



Ans. (i) 'D' Spermatids = undergo spermiogenesis

(ii) 'A'= Spermatogonium; B = Primary spermatocyte

(iii) 'B' = Diploid E = Haploid

(iv) 'F' = Sertoli cells - Nutrition to germ cells

(v) Mitosis in Cell 'A', Meiosis in cell 'B'

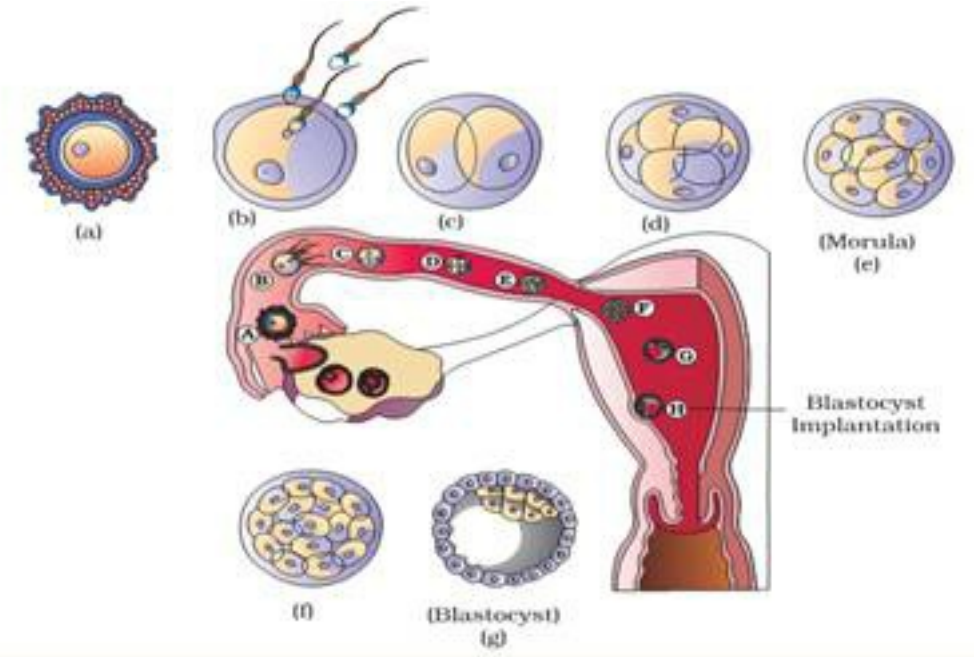
2. Explain the development of human embryo with diagrams.

Ans. The Fusion of the sperm and the egg in humans result into formation of the diploid structure called zygote. The zygote starts dividing mitotically as it moves through the oviduct

into the uterus to form 2,4,8,16 daughter cells called blastomeres. The stage is called morula. The Morula divides further and differentiates into blastocysts. The outer layer of blastomeres called trophoblast gets attached to the endometrial layer of the uterus.

The uterine wall divides and encloses the blastocysts and this is referred to as implantation.

The inner layer of blastomeres in the blastocysts gives rise to the embryo.



3. What is menstruation? What are the specific actions of FSH, LH, estrogen & progesterone in menstrual cycle?

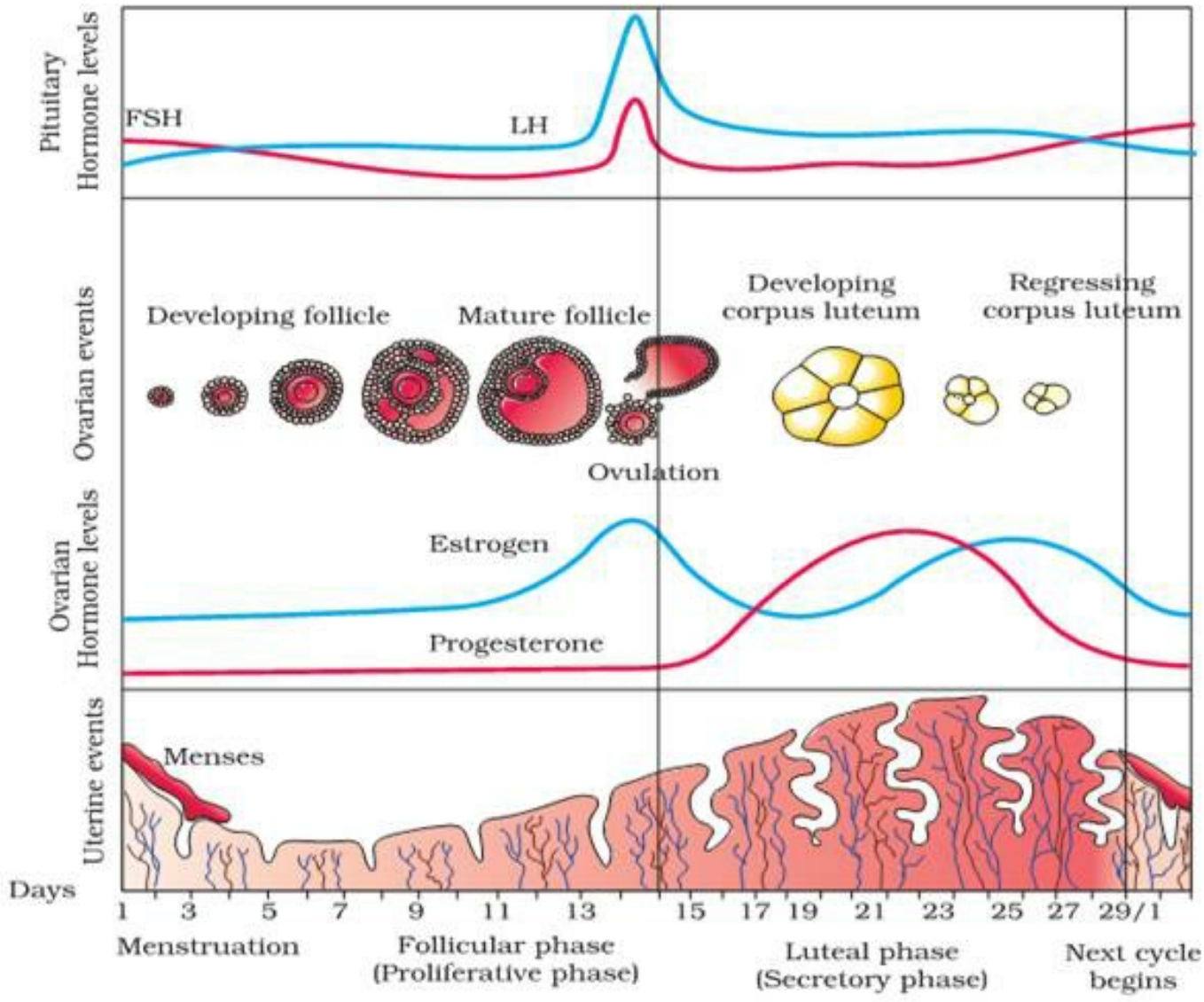
Ans. During menstrual phase of menstrual cycle which starts on 28th day the endometrial lining of female genital tract break down due to lack of progesterone As a result bleeding occurs. This monthly flow of blood is caller menstruation.

During menstrual cycles, the various changes occurs in the ovary under the influence of various hormones :-

1. Menstrual phase :- The levels of hormones LH ,FDH estrogen & progesterone is very less which results in breakdown of endometrial lining of uterus.
2. Follicular phase :- In this phase , the levels of pituitary hormones FSH & LH increases which causes ovarian hormone estrogen to release,. FSH controls the follicular phase , it stimulates the growth of follicles. Both FSH & LH reach their peak level in middle of cycle

(14th day)

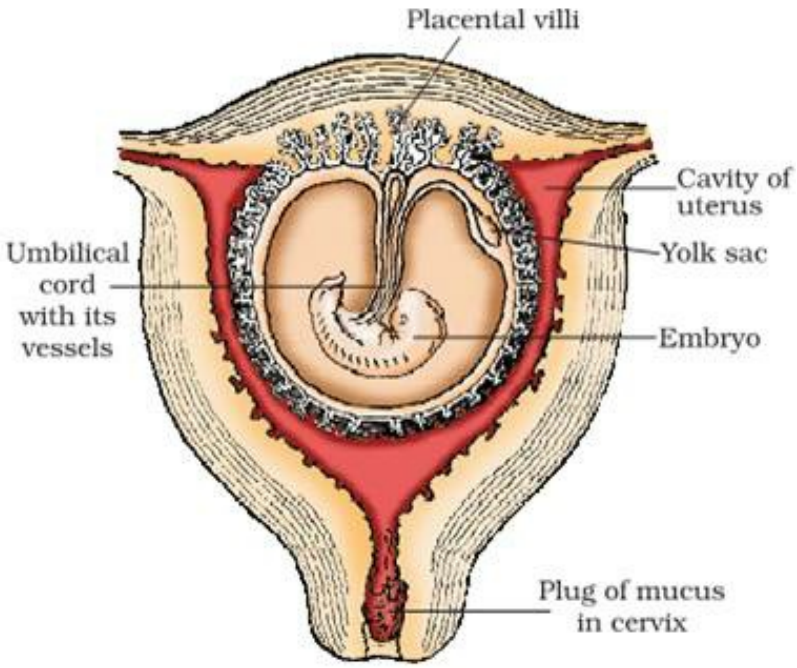
3. OVULATORY PHASE :- The level of LH hormones reaches its peak (called LH swing) induces the ruptures of mature Graffian follicle & there by release of ovum
4. Luteal phase :- The LH & FSH hormones begins to decline. After ovulation, the follicle becomes to ruptures & is transformed into corpus Luteum which secretes large quantities of progesterone



4. **A woman has conceived & implantation has occurred within her uterus. Discuss the sequence of changes up to parturition which will take place within her body under the influence of various hormones.**

Ans. The following changes takes place in the body of women after implantation :-

1. The trophoblast differentiates into two layers outer layer secretes enzymes to dissolve the endometrium of uterus.
2. The inner layer grows out as finger – like projections called chorionic villi into uterine stoma. The chorionic villi & the uterine tissue become inter digitated to form structural & functional unit called placenta.
3. Placenta secretes hormones like HCG, HPL , estrogen & progesterone that are necessary to maintain pregnancy
4. Umbilical cord, the structure that connects the placenta with the foetus is formed.
5. Simultaneously, inner cell mass differentiates into outer layer called ectoderm & inner layer called endoderm. & a middle layer called mesoderm appears between ectoderm & endoderm.
6. The primary germ layers give rise to all the tissues & organs of the adults e.g. after one month heart is formed & after second month digits & limbs are formed.
7. By the end of ninth month of pregnancy, foetus is completely developed & is ready for delivery.
8. During parturition, ovary secretes a hormone called relaxin that facilitates parturition which softens the connective tissue. Mild contraction called foetal ejection reflex is induced. This triggers release of oxytocin from posterior pituitary. Oxytocin induces stronger leads to expulsion of baby from uterus, through birth canal.



CBSE Class 12 Biology
Important Questions
Chapter 4
Reproductive Health

3 Marks Questions

1. Give another name for sexually transmitted diseases. Name two sexually transmitted diseases which are curable and two diseases which are not curable.

Ans. Veneral disease (VD)/Reproductive tract infection (RTI)

Curable : Syphilis, Gonorrhoea

Non Curable : Hepatitis B, AIDS, Genital herpes

2. Differentiate between Vasectomy and Tubectomy.

Ans.

	Vasectomy		Tubectomy
1. 2. 3.	Method of sterilisation in males Vasa defferentia of both sides are cut and tied Prevents movement of sperms at cut end.	1. 2. 3.	Method of sterilisation in females. Fallopian tube of both sides are cut and tied. Prevent movement of egg at cut end.

3. Name the techniques which are employed in following cases :

(a) Transfer of an ovum collected from a donor into the fallopian tube of another female who cannot produce ova but can provide suitable environment for fertilisation and development.

(b) Embryo is formed in laboratory in which sperm is directly injected into ovum.

(c) Semen collected either from husband or a healthy donor is artificially introduced either into vagina or uterus.

Ans. (a) Gamete intra fallopian transfer.

(b) Intra cytoplasmic sperm injection

(c) Intra uterine insemination.

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4. Mention the various precautions one has to take in order to protect himself/herself form STDs.

Ans. (i) Avoid blood transfusion from an infected person.

(ii) Avoid sex with an unknown partner or multiple partners.

(iii) Always use condom.

(iv) Avoid sharing of injections needles and syringes and surgical instruments.

---

5. What are the disturbing trends observed regarding MTP?

Ans. Majority MTPs performed illegally by unqualified quacks, missuse for female foeticide.

---

6. Enlist any three causes of infertility in men and women.

Ans. Reasons for infertility in men and women are:

---

7. State the consequences of over population.

Ans. The consequences of overpopulation are :

- An increase demand and therefore pressure on the natural resources.
- An increase in the level of pollution.
- More number of unemployment, poor infrastructure and pressure on the country's economy.

8. Differentiate between natality rate and mortality rate.

Ans.

Natality rate (Birth rate)	**Mortality rate (Death rate)**
1. It is the number of births per one thousand individuals per year.	1. It is the number of deaths per one thousand individuals per year.
2. It is the rate at which the new members are added to the population by reproduction.	2. it is the rates at which the individuals die out.
3. It increases population size and population density.	3. It decreases population size and population density.

9. Explain any one natural method of birth control.

Ans. One of the natural methods of birth control is Periodic abstinence or Rhythm method. The couple avoids or abstains from coitus from day 10 to 17 of the menstrual cycle because ovulation occurs during this period and therefore the period is highly fertile. The method is based on the facts the ovum remains alive for 1-2 days and the sperm remains alive for about 3 days. The effectiveness of this method is limited as most of the women have irregular menstrual cycle.

10. Give three differences between tubectomy and vasectomy.

Ans.

Vasectomy	**Tubectomy**
1. It is a sterilization technique for men.	1. It is a sterilization technique for women.
2. The two vasa differentia are cut and tied up.	2. The two oviducts are cut and tied up.
3. Passage of sperms is prevented.	3. Passage of ova is prevented.

11. Describe the three manners in which fertilization of human ovum by sperm can be prevented?

Ans. **I. NATURAL METHODS :** avoiding chances of meeting between the gametes.

1. Periodic Abstinence :-couples avoid coitus from 10-17th day of menstrual cycle when ovulation is expected.
2. Lactational Amenorrhoea :- absence of menstruation during intense lactation.

II. BARRIER METHODS :- ovum & sperms are prevented from coming closer with the help of barriers.

1. Condoms :- barriers made up of thin rubber or latex sheath to cover penis in makes or cervix in females.
2. Diaphragms cervical caps :- made up of rubber & are reusable
3. Spermicidal creams along with these barriers

1. **SURGICAL METHODS :-** blocks transport of gametes & thereby conception.

1. Vasectomy :- small portion of vas deferens is removed or tied up through incision in scrotum.
2. Tubectomy :- small portion of fallopian tube is removed or tied up through vagina.

12. Suggest some methods to assist infertile couples to have children?

Ans. Three are special techniques called Assisted Reproductive Technologies (ART) to help infertile couples to have children:-

1. Test tube Baby Programme :- In this method, ova from wife or donor female & Sperm from husband are allowed to fuse under simulated conditions in the laboratory it is called In-vitro fertilization (IVF). The zygote is then transferred into uterus or fallopian tube this process is called embryo transfer (ET)
2. Gamete Intra fallopian Transfer (GIFI) :- It involves transfer of an ovum collected from a donor female into another female who cannot produce ova but can provide suitable condition for fertilization

3. Artificial Insemination: - In this method semen is collected from the husband or a healthy donor & is artificially introduced into vagina or uterus.

13. Briefly explain the various reproductive technologies to assist an infertile couple to have children.

Ans. Assisted Reproductive Technology (ART) includes in vitro fertilization-embryo transfer (IVF-ET), gamete intrafallopian transfer (GIFT), zygote intrafallopian transfer (ZIFT), and frozen embryo transfer (FET). These techniques also apply to oocyte donation and gestational carriers. Approximately 99 percent of ART cycles performed are IVF-ET. IVF-ET has helped many couples conceive successfully. ART may be recommended when other treatments (such as intrauterine insemination) have not been successful or when there is severe male factor infertility, severe endometriosis or tubal obstruction.

CBSE Class 12 Biology
Important Questions
Chapter 5
Principles of Inheritance and Variation

1 Marks Questions

1. Give any two reasons for the selection of pea plants by Mendel for his experiments.

Ans.(i) Many varieties with contrasting forms of characters

(ii) Can easily be cross pollinated as well as self pollinated.

2. Name any one plant that shows the phenomenon of incomplete dominance during the inheritance of its flower colour.

Ans. Dog flower (Snapdragon or Antirrhinum sp.)

3. Name the base change and the amino acid change, responsible for sickle cell anaemia.

Ans. GAG changes as GUG, Glutamic acid is substituted by valine.

4. Name the disorder with the following chromosome complement.

(i) 22 pairs of autosomes + X X Y

(ii) 22 pairs of autosomes + 21st chromosome + XY.

Ans.(i) Klinefelters Syndrome **(ii)** Downs syndrome

5. A haemophilic man marries a normal homozygous woman. What is the probability that their daughter will be haemophilic?

Ans. Their daughter can never be haemophilic. (0%).

6. A test is performed to know whether the given plant is homozygous dominant or heterozygous. Name the test and phenotypic ratio of this test for a monohybrid cross.

Ans. Test cross 1 : 1.

7. Name the phenomena that occur when homologous chromosomes do not separate during meiosis.

Ans. Non – disjunction.

8. Name one trait each in humans & in drosophila whose genes are located on sex chromosome.

Ans. Humans - Colorblindness

Drosophila - Eye colour

9. What is meant by aneuploidy?

Ans. Aneuploidy is the phenomena of gain or loss of one or more chromosomes that results due to failure of separation of members of homologous pair of chromosomes during meioses.

10. What genetic principle could be derived from a monohybrid cross?

Ans. Law of dominance.

11. Which one change is the cause of sickle – cell anaemia ?

Ans. It is caused due to a point mutation at 6th position in B-chain of hemoglobin in which glutamic acid is replaced by valine.

12. What is a test cross?

Ans. It is a cross where offspring with dominant phenotype whose genotype is not known is crossed with an individual homozygous recessive for the trait.

13. What is mutagen? Give an example?

Ans. The physical or chemical agents that causes mutations are called mutagen eg x-rays, CNBr etc.

14. What was the total number of varieties of garden pea which Mendel had taken to start his experiment?

Ans. fourteen.

15. Name any one plant & its feature that shows the phenomena of incomplete dominance?

Ans. Antirrhium majus which shows incomplete dominance in flower colour.

CBSE Class 12 Biology
Important Questions
Chapter 5
Principles of Inheritance and Variation

2 Marks Questions

1. Identify the sex of organism as male or female in which the sex chromosome are found as

(i) ZW in bird (ii) XY in Drosophila (iii) ZZ in birds. (iv) XO in grasshopper.

Ans. (i) Female; (ii) Male; (iii) Female (iv) Male

2. Mention two differences between Turner s syndrome and Klinefelter's syndome.

Ans. Turners Syndrome : The individual is female and it has 45 chromosomes

i.e., one X chromosome is less.

Klinefelters Syndome : The individual is male and has 47 chromosomes

i.e., one extra X chromosome.

3. The human male never passes on the gene for haemophilia to his son. Why is it so?

Ans. The gene for haemophilia is present on X chromosome. A male has only one X chromosome which he receives from his mother and Y chromosome from father. The human male passes the X chromosome to his daughters but not to the male progeny (sons).

4. Mention four reasons why Drosophila was chosen by Morgan for his experiments in genetics.

Ans. (i) Very short life cycle (2-weeks)

(ii) Can be grown easily in laboratory

(iii) In single mating produce a large no. of flies.

(iv) Male and female show many hereditary variations

(v) It has only 4 pairs of chromosomes which are distinct in size and Shape.

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5. Differentiate between point mutation and frameshift mutations.

Ans. Point Mutations : Arises due to change in a single base pair of DNA e.g., sickle cell anaemia. Frame shift mutations : Deletion or insertion/duplication/addition of one or two bases in DNA.

---

6. Give any two similarities between behavior of genes (Mendel's factor) during inheritance & chromosomes during cell division.

Ans. (i) In diploid cells, the chromosomes are found in pairs just like that of mendelian factors.

(ii)During meiosis, the chromosomes of different homologous pairs are assorted independently into gametes at random showing parallelism with mendelian factors.

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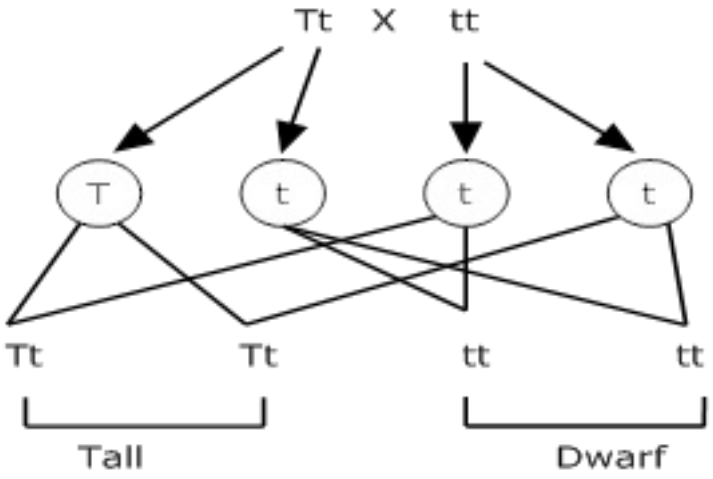
7. Which law of Mendel is universally accepted? State the law?

Ans. Mendel's law of segregation is universally accepted It states that – "the two alleles of a gene remain separate & do not contaminate each other in F1 or the hybrid. At the time of gamete formation two alleles separate & pars into deferent gametes.

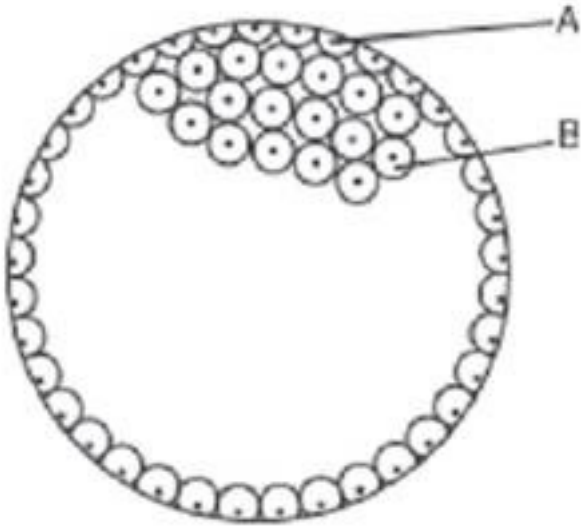
---

8. How will you find out whether a given plant is homozygous or heterozygous?

Ans. To test whether a plant is homozygous or heterozygous, test cross is performed in which individual is crossed with homozygous recessive for the trait. If plant is heterozygous, progeny of test cross consists of tall and dwarf plants in the ratio l:l



If plant is homozygous, progeny of test cross will have all tall plants



9. Why do sons of haemophilic father never suffer from this trait?

Ans. Since haemophilic is a sex – linked character, it shows criss – cross inheritance i-e from father to his daughter therefore son of haemopilic father is never haemophilic.

10. How is the child affected if it has grown from the zygote formed by an XX-egg fertilized by Y-carrying sperm? What do you call this abnormality?

Ans. If a child has grown from the zygote formed by XX-egg fertilized by Y-sperm, the child will suffer from klinefiter syndrome & will have XXY genotype. It is characterized by prominent feminine characters e.g. tall stature with feminised physique, Breast development pubic hair pattern, poor beard growth & sterility.

11. The map distance in certain organism between genes A & B is 4 units, between B & C is units, & between C & D is 8 units which one of these gene paves will show more recombination frequency? Give reason.

Ans. C& D will show maximum gene recombination because genes which are more closely linked, frequency of recombination is least & vice versa.

12. Give the chromosomal constitution & related sex in each of the following :-

i) Turner syndrome

ii) Klinefilter syndrome

ans. i) Turner syndrome – XO females containing 45 chromosomes & lacking one X-chr .

ii) Klinefilter syndrome XXY males containing 47chr, one extra X-chromosome in males.

13.What is pedigree Analysis? How is it useful?

Ans. The analysis of family history about inheritance of a particular trait in several generations of a family is called pedigree Analysis. It provides a strong tool which is utilized to trace inheritance of specific trait or abnormality or disease.

14. What are multiple alleles? Give an example?

Ans. The presence of more then two alleles of a trait is called multiple alleles e.g. in human beings four types of blood groups are recognized and there different alleles IA IB & IO of a gene determines the phenotype of four blood groups.

CBSE Class 12 Biology
Important Questions
Chapter 6
Molecular Basis of Inheritance

1 Marks Questions

1. Name the factors for RNA polymerase enzyme which recognises the start and termination signals on DNA for transcription process in Bacteria.

Ans. Sigma (s) factor and Rho(p) factor)

2. Mention the function of non-histone protein.

Ans. Packaging of chromatin

3. During translation what role is performed by tRNA

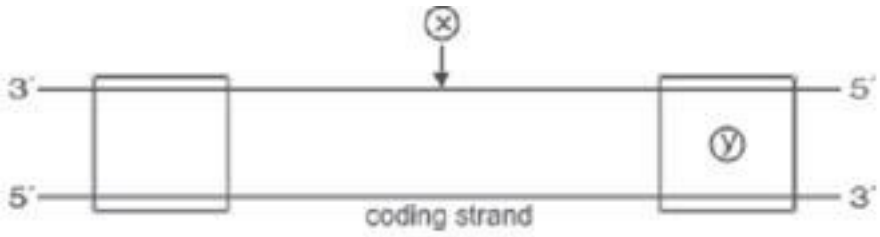
Ans. (i) Structural role

(ii) Transfer of amino acid.

4. RNA viruses mutate and evolve faster than other viruses. Why?

Ans. -OH group is present on RNA, which is a reactive group so it is unstable and mutate faster.

5. Name the parts 'X' and 'Y' of the transcription unit given below.



Ans. X - Template strand, Y - Terminator.

6. Mention the dual functions of AUG.

Ans. (i) Acts as initiation codon for protein synthesis

(ii) It codes for methionine.

7. Write the segment of RNA transcribed from the given DNA

3´ -A T G C A G T A C G T C G T A '5´- Template Strand

5´ - T A C G T C A T G C A G C A T '3´ - Coding Strand.

Ans. 5'- U A C G U C A U G C A G C A U – 3' (In RNA 'T' is replaced by'U')

8.Name the process in which unwanted mRNA regions are removed & wanted regions are joined.

Ans.RNA splicing.

9.Give the initiation codon for protein synthesis. Name the amino acid it codes for?

Ans. Initiation codon – AUG & it code for methionine.

10.In which direction, the new strand of DNA synthesised during DNA replication.

Ans.5'$\rightarrow$ 3

11.What is the function of amino acyl tRNAsynthetase.

Ans. Amino acyl tRNAsynthetasecatalyses activation of amino and attachment of activated amino acids to the 3-end of specific tRNA molecule.

12.What is point mutation?

Ans. Mutation due to change in a single base pair in a DNA sequence is called point mutation.

13.Name the enzyme that joins the short pieces in the lagging strand during synthesis of DNA?

Ans. Ligase.

14.Name the enzyme which helps in formation of peptide bond?

Ans. Peptidyltransferase

15.Who experimentally prove that DNA replication is semi conservative.

Ans. Messelson&stahl.

16.What is a codon?

Ans. Triplet sequence of bases which codes for a single amino is called a codon.

17.Name the three non-sense codons?

Ans.UAA, UAG, UGA

18.What is the base pairing pattern of DNA?

Ans. In DNA, adenine always binds with thymine & cytosine always binds with Guanine.

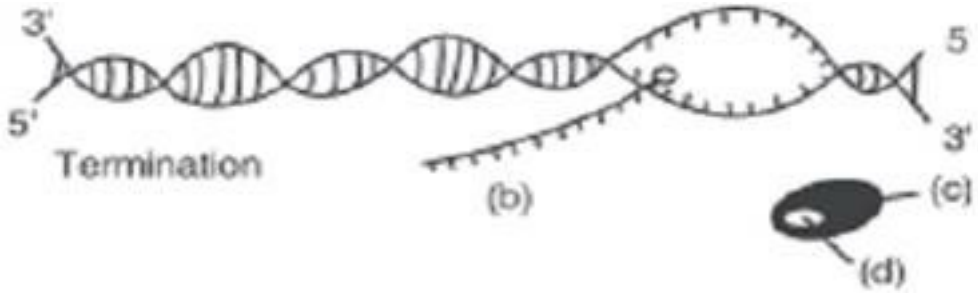
19.Mention the dual functions of AUG?

Ans.AUG codes for amino acid methionine & also acts as an initiator codon.

CBSE Class 12 Biology
Important Questions
Chapter 6
Molecular Basis of Inheritance

2 Marks Questions

1. The process of termination during transcription in a prokaryotic cell is being represented here. Name the label a, b, c and d.



Ans. (a) DNA molecule
(b) mRNA transcript
(c) RNA polymers
(d) Rho factor

2. Complete the blanks a, b, c and d on the basis of Frederick Griffith Experiment.
S Strain → inject into mice → (a)
R strain → inject into mice → (b)
S strain (heat killed) → inject into mice → (c)
S strain (heat killed) + R strain (live) → inject into mice → (d)
Ans.(a) Mice die
(b) mice live
(c) mice live
(d) mice die

3. Give two reasons why both the strands of DNA are not copied during transcription.
Ans. (a) If both the strands of DNA are copied, two different RNAs(complementary to each

other) and hence two different polypeptideswill produce; If a segment of DNA produces two polypeptides, thegenetic information machinery becomes complicated.
(b) The two complementary RNA molecules (produced simultaneously)would form a doublestranded RNA rather than getting translated intopolypeptides.
(c) RNA polymerase carries out polymerisation in 53direction andhence the DNA strand with 35 polarity acts as the template strand.(Any two)

---

4. Mention any two applications of DNA fingerprinting.

Ans.(i) To identify criminals in the forensic laboratory.

(ii) To determine the real or biological parents in case of disputes.

(iii) To identify racial groups to rewrite the biological evolution. (Any two)

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5. State the 4 criteria which a molecule must fulfill to act as a genetic material.

Ans.(i) It should be able to generate its replica.

(ii) Should be chemically and structurally stable.

(iii) Should be able to express itself in the form of Mendelian characters.

(iv) Should provide the scope for slow changes (mutations) that are necessary for evolution.

6.“DNA polymerase plays a dual function during DNA replication” comment on statement?

Ans.DNA polymerase plays a dual function –it helps in synthesis of new strand & also helps in proof reading i.e replacement of RNA strands lay DNA fragments.

7.Three codons on mRNA are not recognised by tRNA what are they? What is the general term used for them what is their significance in protein synthesis?

Ans.UAG UAA & UGA are the three codons that are not recognised by tRNA these are known as stop codon or non-sense codon. Since these three codons are not recognised by any tRNA

they help in termination of protein chain during translation.

8.Give two reasons why both the strands of DNA are not copied during DNA transcription?

Ans.I)If both the strands code for RNA two different RNA molecules & two different proteins wouldbe formed hence genetic machinery would become complicated

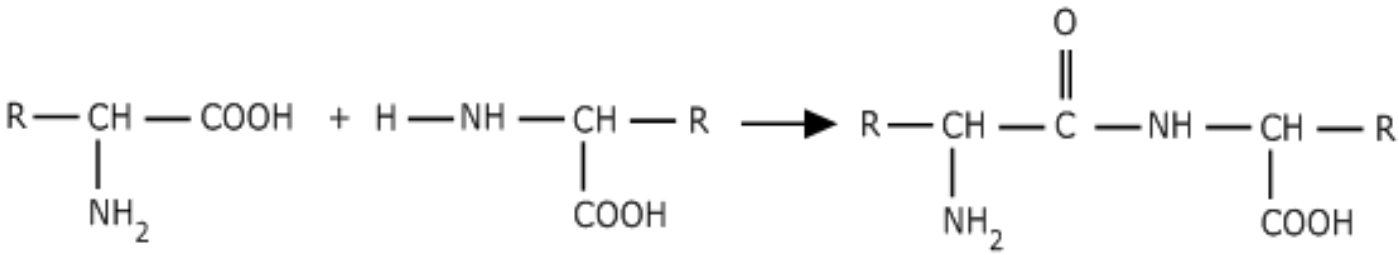
II) Since the two RNA molecules would be complementary to each other, they would wind togetherto form dsRNA without carrying out translation which means process of transcription would befutile

9.Why is it essential that tRNA binds to both amino acids & mRNA codon during protein synthesis?

Ans. It is essential that tRNA binds to both amino acids & mRNA codon because tRNA acts as an adapter molecule with picks up a specific activated aminoacid from the cytoplasm & transferred it to the ribosomal in the cytoplasm where proteins are synthesized. It attracts itself to ribosome with the sequence specified by mRNA & finally it transmits its amino acid to new polypeptide chain.

10.What is peptide bond? How is it formed?

Ans. Peptide bond is formed between carboxylic group (COOH) of first amino acid & amino group (-NH2) of second amino acid. This reaction is catalysed by peptidyltransferase



11.Explain what happens in frameshift mutation? Name one disease caused by the disorder?

Ans. Frameshift mutation is a type of mutation where addition or deletion of one or two bases changes the reading from the site of mutation, resulting in protein with different set of amino acid.

12.What do you mean by "Central Dogma of Molecular genetics?"

Ans. The central dogma of molecular genetics is the flow of genetic information from DNA to DNA through replication, DNA to mRNA through transcription & mRNA to proteins through translation.

ReplicationDNA $\rightarrow$ mRNA $\rightarrow$ proteins. transcription translation

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13.Give two reasons why both the strands are not copied during transcription?

Ans.i) If both the strands codes for RNA, two different RNA molecules & two different proteins areformed hence genetic machinery would be complicated.

ii)Since two RNA molecules produced would be complementary to each other, they would wind together to form ds-RNA.

14.Why is human Genome project considered as mega project?

Ans. Human Genome project was called mega project for the following facts.

1. The human genome has approximately 3.3 x 109bp, if the cost of sequencing is US $3perbp, theapproximatecostisaboutUS$ g billion.
2. If the sequence obtained were to be stored in a typed form in books & if each page contained1000 letters & each book contained 1000 page than 3300 such books would be needed to store complete in formation
3. The enormous quantity of data expected to be generated also necessitates the use of high speedcomputational devices for data storage, retrieval & analysis.

15.Why is DNA & not RNA is the genetic material in majority of organisms?

Ans. The -OH group in the nucleotides of RNA is much more reactive & makes RNA labile &

easily degradable thus, DNA and not RNA acts as genetic material in majority of organisms.

16.Mention any four important characteristics of genetic code.

Ans. Genetic codon has following imp-features :-

1. Each codon is a triplet consisting of three bases.
2. Each codon codes for only one amino acid i.e. – unambiguous.
3. Some amino acids are coded lay more than one codon ∴ said to be degenerative.
4. Codons are read in a continuous manner in direction & have no punctuation.

17.Why it is that transcription & translation could be coupled in prokaryotic cell but not in eukaryotic cell?

Ans. In prokaryotes the mRNA synthesised does not require any processing to become active &both transcription & translation occurs in the same cytosol but In Eukaryotes, primary transcriptcontains both exon & intron & is subjected to a process called splicing where introns are removed &exons are joined in a definite order to form mRNA.

CBSE Class 12 Biology
Important Questions
Chapter 6
Molecular Basis of Inheritance

5 Marks Questions

1. What is meant by semi conservative replication? How did Meselson and Stahl prove it experimentally?

Ans. Meselson and Stahl, performed an experiment using E.coli to prove that DNA replication is semi conservative.

- They grew E.coli in a medium containing $^{15}NH_4Cl$.
- Then separated heavy DNA from normal (14N) by centrifugation in CsCl density gradient.
- The DNA extracted, after one generation of transfer from 15N medium to 14N medium, had an intermediate density.

-The DNA extracted after two generations consisted of equal amounts of light and hybrid DNA.

-They proved that DNA replicates in a semiconservative manner.

2. What does the lac operon consist of? How is the operator switch turned on and off in the expression of genes in this operon? Explain.

Ans. Lac Operon consists of the following :

- Structural genes : z, y, a which transcribe a polycistronic mRNA.
- gene ‘z’ codes for b-galactosidase
- gene‘y’ codes for permease.
- gene‘a’ codes for transacetylase.
- Promotor : The site where RNA polymerase binds for transcription.
- Operator : acts as a switch for the operon

- Repressor : It binds to the operator and prevents the RNAPolymerase from transcribing.
- Inducer : Lactose is the inducer that inactivates the repressor by binding to it.
- Allows an access for the RNA polymerase to the structural gene andtranscription.

3. What is an operon? Describe the major steps involved in an operon?

Ans. Operon is a group of controller & structural genes which controls the catabolism of the cell geneticallyeg lactose operon / lac operon.

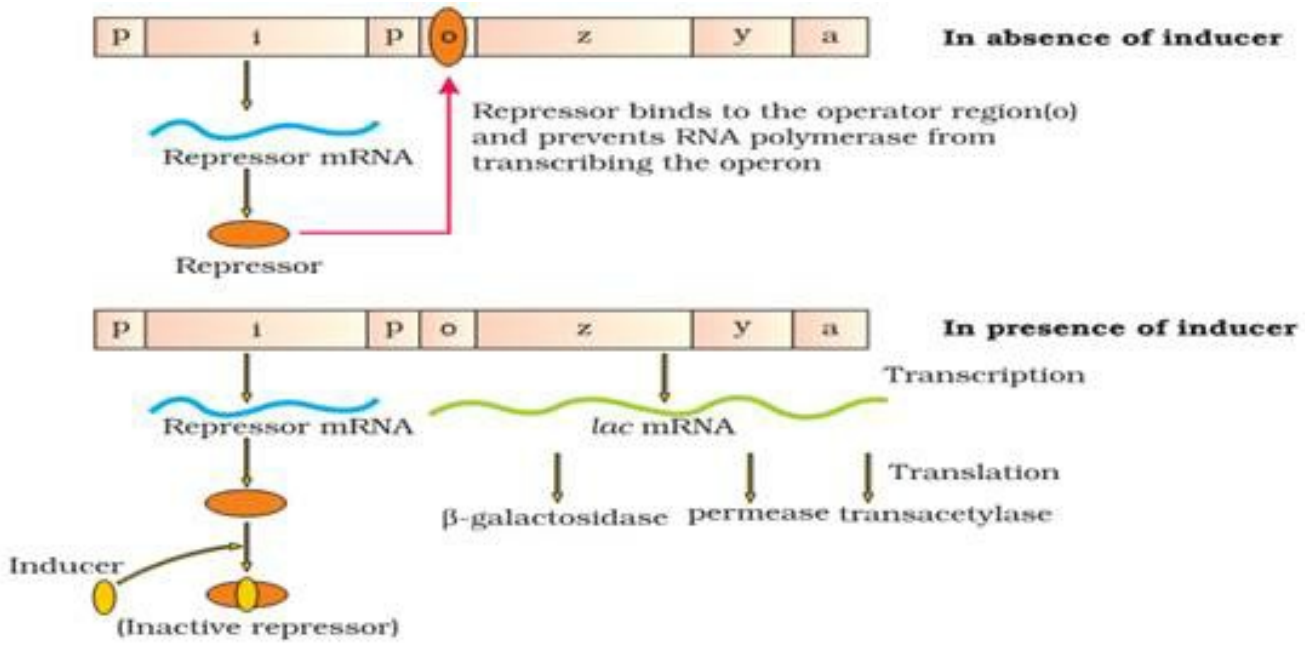
(i) When inducer or lactose is absent :-

The lac regulator gene synthesize a repressor protein by transcription & translation. This repressor protein binds with operator site of lac operon & blocks RNA polymerase. Thus, RNA polymerase unable to transcribe mRNA & structural gene unable to translate enzyme B-galactosidase.

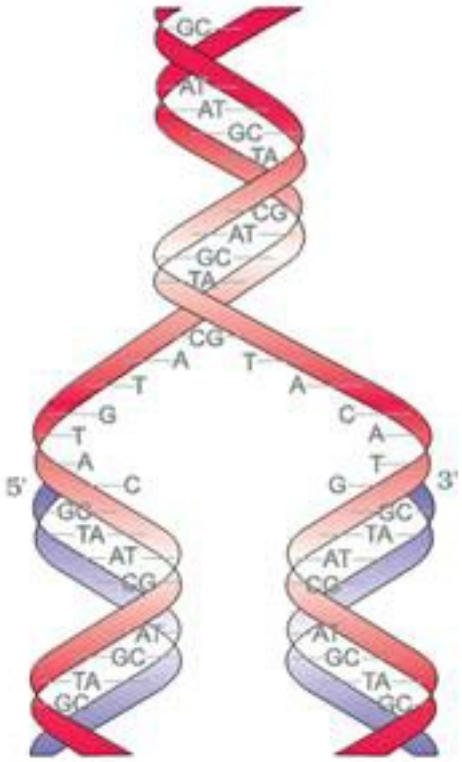
(ii) When inducer or lactose is present :_

The lac regulator gene transcribe mRNA &synthesise active lac repressor protein & at the same time lactose is converted into isomer allolactose. Allolactose binds to active lac repressor due to which it is converted to inactive repressor. This inactive repressor is released from operator site of lac operon & RNA polymerase binds to promoter & starts to transcribe mRNA & forms β-galactosidase are which converts lactose into glucose &galactose.

Thus, presence of lactose determines whether or not lac. Repressor is bound to operator & genes are expressed on not.



4.What do you mean semi conservative nature of DNA replication. Who proved it & how?



Ans. Semiconservative nature of DNA replication suggested that during replication two strandswould separate & each acts as a template for the synthesis of new complementary strand so, thatafter complete replication, each DNA molecule would have one parental & one

newly synthesizedstrand thus, half the information is conserved over generation.Mathew Messselson& Franklin stahl have performed an experimentusing Escherichia coli to prove that DNA replication isSemiconservative. They grew E.coli in a medium containing 15

{tex}N{{H}_{4}}Cl**{/tex}**

until 15N wasincorporated in the two strands of newly synthesised DNA this heavyDNA can be separated from normal DNA lay centrifugation in

{tex}CsCl**{/tex}**

density gradient. Then they transferred the cells into a medium withnormal

{tex}^{14}N{{H}_{4}}Cl**{/tex}**

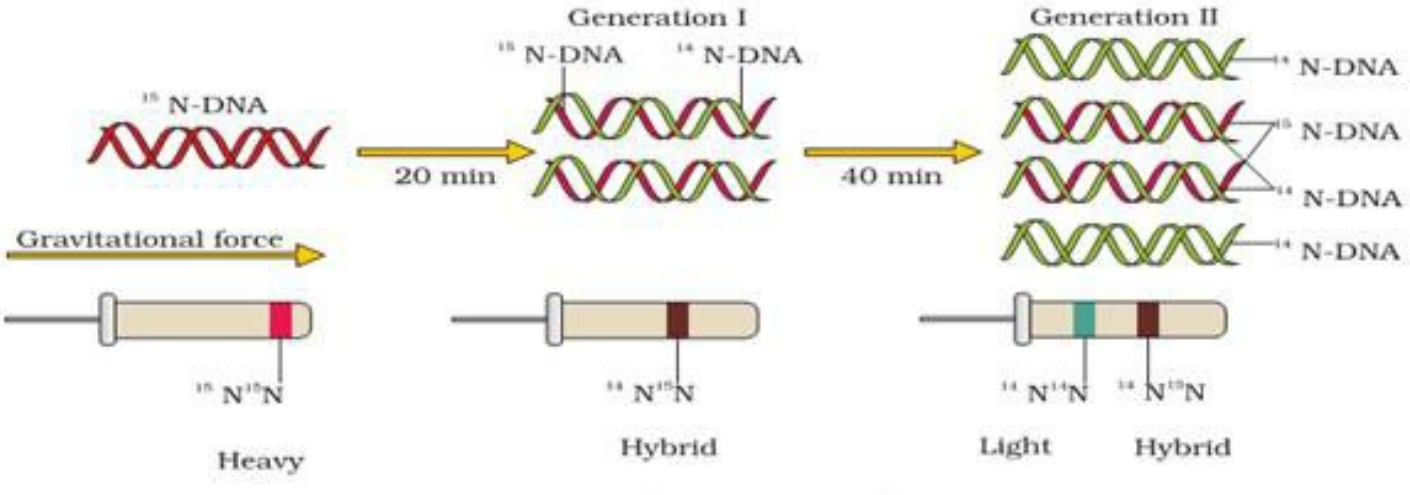
& took samples at various time intervals & extractedDNA & centrifuged then to measure their densities. The DNA extracted from the cells after onegeneration to transfer from

{tex}^{15}N**{/tex}**

medium to

{tex}^{14}N**{/tex}**

medium had an intermediate / hybrid density. TheDNA extracted after two generations (i-e after 40 min) consisted of equal amount of “light” DNA &“Hybrid”DNA.



(Separation of DNA by Centrifugation)

5.Where do transcription & translation takes place in a prokaryotic cell? Describe the three stepsinvolved in translation?

Ans. In a prokaryotic cell both transcription & translation occurs in cytoplasm. It consist offollowing steps :-

(i)ACTIVATION OF AMINO ACIDS :- amino acids are activated in the presence of ATP lay enzaminoacyltRNASynthetase.

(ii)BINDING OF ACTIVATED AMINOACID WITH tRNA :- Activated amino acids binds with specific tRNA to form charged tRNA .

(iii)INITIATION OF POLYPEPTIDE CHAIN :- Initiation codon is AUG which codes for methionine. Initiation codon of mRNA binds to p-site of ribosome with the help of initiation factors.

(iv)ELONGATION OF POLYPEPTIDE CHAIN :-

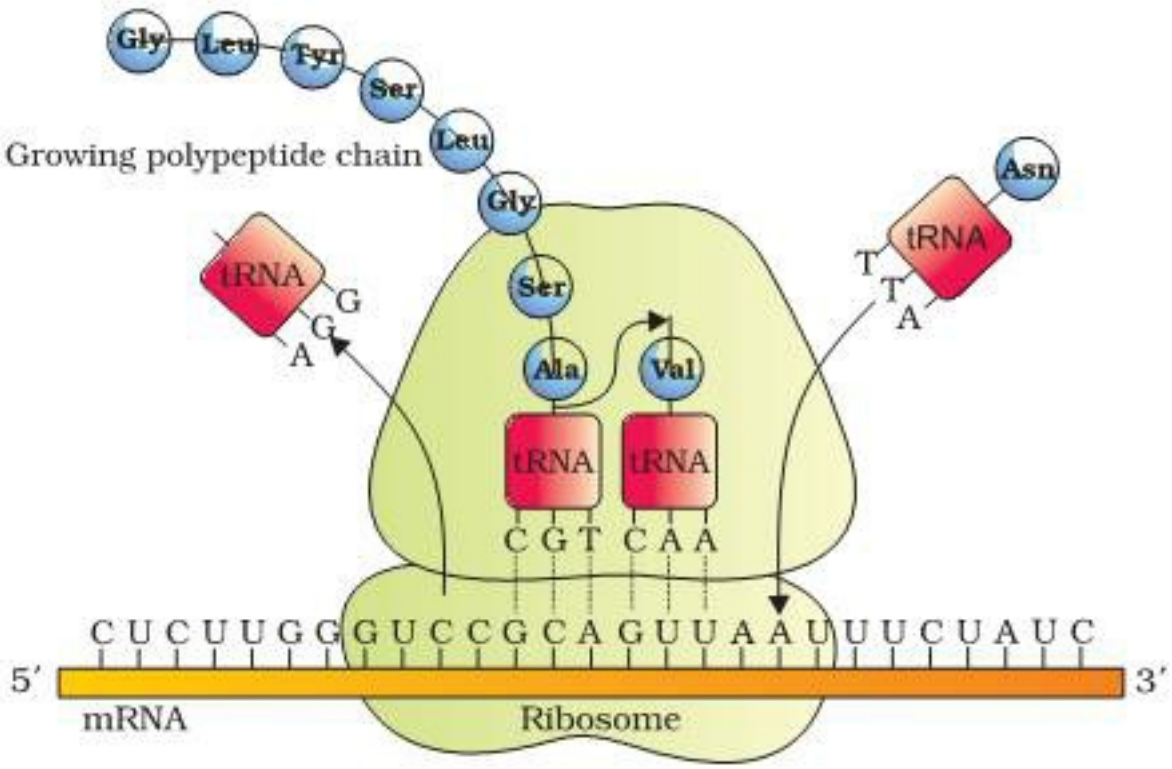
(a)Second activated amino acid along itstRNA reaches the 'A' site & binds to mRNA codon next to AUG.

(b)A peptide bond is formed betweentwo amino acid by peptidyl transferase.

(c) Ribosomes translocation mRNA in -direction due to which free tRNA slips away &peptidyltRNA reaches at P – site. Now third amino acid reaches at A – site & process continues.

(d)TERMINATION OF POLYPEPTIDE CHAIN :- When a termination codon (UAA, UAG, UGA) reaches at A- site translation terminates Since there is no specific tRNA for these codons.

(i)



6.Who performed the blender experiment? What does this experiment prove? Describe the stepsfollowed in this experiment?

Ans. The proof for DNA as the genetic material came from the experiments of Harshey& chase whoworked with bacteriophage.

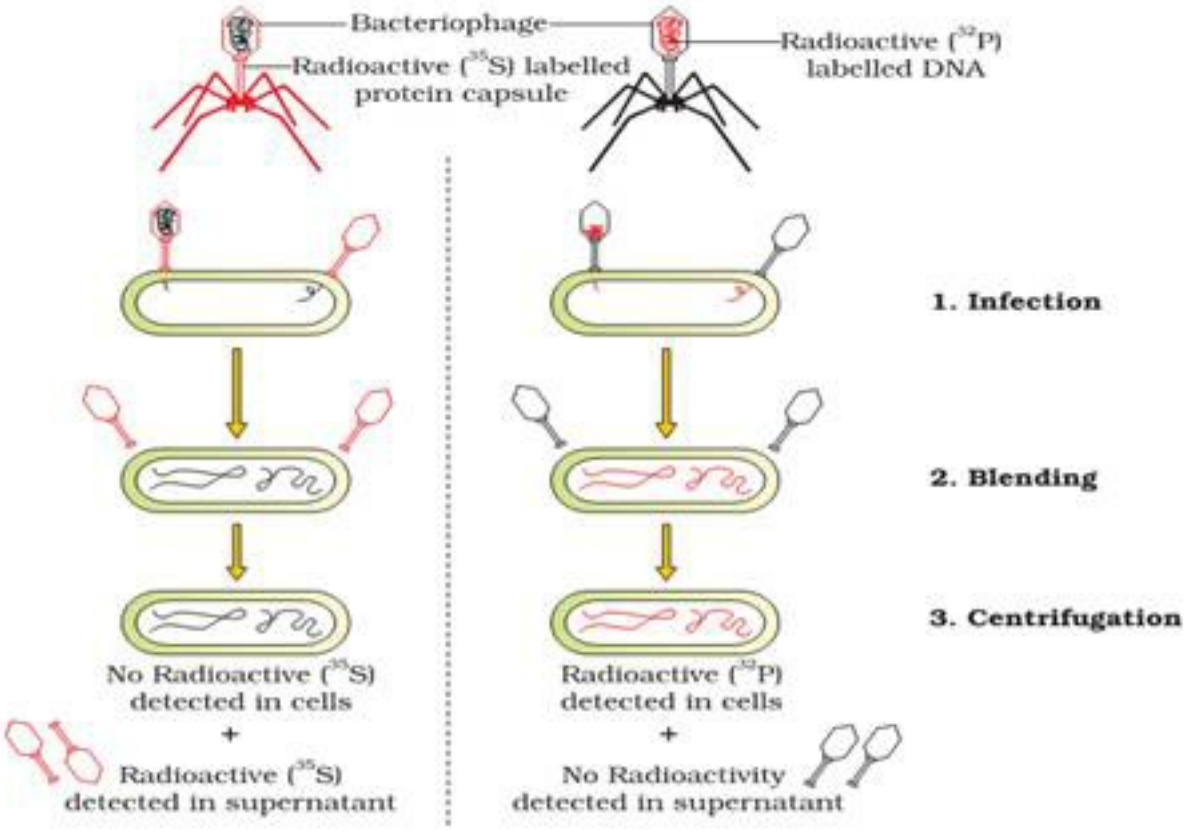
The bacteriophage on infection injects only the DNA into the bacterial cell & not the protein coat.

Bacterial cell treats the viral DNA as its own & subsequently manufactures more virus particles.

They grew some viruses on a medium that ‘contained radioactive Phosphorus & some other on medium that contained radioactive sulphur. Virus grown in the presence of radioactive phosphorus contained radioactive DNA but not proteins because DNA contains phosphorus. Similarly virus grown on radioactive sulfur contained radioactive protein because DNA does not contain sulfur.

Radioactive phages are allowed to infect E. coli bacteria & soon after infection the cultures weregently agitated in a blender to separate the adhering protein coat of virus from bacterial

cell.It was found that when phage containing radioactive DNA was used to infect the bacteria itsradioactivity was found in bacterial cells indicating that DNA has been injected into bacterial cell so,the DNA is the genetic material & not proteins



CBSE Class 12 Biology
Important Questions
Chapter 7
Evolution

2 Marks Questions

1. Explain Oparin-Haldane theory of chemical evolution of life.

Ans. The first life form could have come from the pre-existing, non-living organic molecules (like RNA, Proteins, etc.) and the formation of life was preceded by chemical evolution.

2. Distinguish between convergent and divergent evolution giving one example of each.

Ans. Divergent Evolution - Development of different functional structures from a common ancestral form is called divergent evolution.
Homologous organs show divergent evolution.
Examples: Darwin's Finches, Australian Marsupials, locomotion in mammals.
Convergent Evolution - Development of similar adaptive functional structures in unrelated groups of organisms is called convergent evolution.
Analogous organs show convergent evolution.
Examples: Australian Marsupials and Placental mammals, various aquatic vertebrate and wings of insect, bird and bat.

3. What is adaptive radiation? Explain with an example.

Ans. Adaptive radiation is an evolutionary process that produces new species from a single, rapidly diversifying lineage. This process occurs due to natural selection. An example of adaptive radiation is Darwin finches, found in Galapagos Island. A large variety of finches is present in Galapagos Island that arose from a single species, which reached this land accidentally. As a result, many new species have evolved, diverged, and adapted to occupy new habitats. These finches have developed different eating habits and different types of beaks to suit their feeding habits. The insectivorous, blood sucking, and other species of finches with varied dietary habits have evolved from a single seed eating finch ancestor.

4. How did Louis Pasteur disprove spontaneous generation theory?

Ans. Louis Pasteur showed that in pre-sterilized flasks, life did not come from killed yeast while in another flask open to air, new organisms arose from 'killed yeast.

5.Define homologous organs? Give one example of organ homologous to hand of man?

Ans. Homologous organs are those organs which are similar in basic structure & embryonic developments but perform different functions. e.g. bones of forelimbs of whales, bat, birds and human beings.

6.What is the role of variation in evolution?

Ans. Variations are useful for survival of species in changed environmental situations. If a population of reproducing organisms are suited to a particular niche & if the niche is drastically altered the population could be wiped out however if some variations were to be present in few individuals, there would be some chances for them to survive.

7.Describe one evidence which decisively proves that birds have evolved from reptiles?

Ans. Missing link between birds & reptiles called. Archaeopteryx showed that "Birds have evolved from reptiles". These are organisms which show the characters of both birds (e.g. presence of wings & feathers in the body) as well as of reptiles (e.g. gong tail & jaws with identical teeth).

8.What is the study of fossils called? Mention any three points how the fossils throw light on past life?

Ans. Study of fossils is known as paleontology.

→ Cross-section of the earth's crust indicates the arrangement of sediments one over the other during the long history of Earth.

→ Different sediments contain different life forms which probably died during the formation ofparticular sediment.

→ Connecting or missing link – which contains characters of different groups.

9.Why has natural selection not eliminated sickle – cell anaemia?

Ans. Sickle cell anaemia is not eliminated during natural selection because in some cases, sickle cell anaemia is beneficial as it provides natural defense against malarial parasite.

10.Life originated from the earth's inorganic atmosphere in the post, but this no longer happens today. Give two reasons?

Ans. Life cannot be originated in the present day atmosphere because:-

(i)The temperature of present day atmosphere is much less than that of primitive atmosphere.

(ii)The present day atmosphere is oxidizing & not reducing due to presence of oxygen.

11.If you discovered a fossil bird with scales on the body & teeth in the beak. What would youconclude about its position in the animal kingdom?

Ans. Since this fossil bird has both avian characters & reptilian characters e.g. scales on body & teeth in beak it would be considered as a connecting link between reptiles & bird.

12.What is speciation? List any two events that lead to speciation?

Ans. Speciation refers to the origin of new species or the phenomena of development of new speciesfrom pre-existing one.

The two factors which lead to speciation are – Genetic drift, mutation & natural selection.

13.Would you consider wings of butterfly & a bat as homologous or Analogous & why?

Ans. Wings of butterfly & bat are said to be analogous because they have originated from different parts – e.g. in butterfly wings are originated from skin and feather & in bats wings are originated from forelimbs but both of them performs the same function of flying.

14.Define natural selection? Who else along with Charles Darwin proposed it as the mechanism of evolution?

Ans. Natural selection is a process of selection lay nature in which individuals with thosecharacteristics which enable them to survive better in natural conditions would outnumber theothers who are less adapted under the same natural conditions Alfred Wallace also proposed the same mechanism of evolution & called it “survival of fittest”.

15.A chimpanzee can hold objects by its hand & an elephant by trunk. Are these organs Analogous or homologous?

Ans. These organs are analogous organs as they are performing the same function of holding objects but are originated from different parts eg forelimbs in chimpanzee & nose in elephants.

16.Differentiate between convergent & divergent evolution?

Ans.

Divergent Evolution	Convergent Evolution
1. Evolutionary process of different species which produces new species diverged from a single ancestral form 2. e.g. Australian marsupials	1. When more than one adaptive radiation occurs in an isolated geographical area. 2. e.g. Camels are found in Asia &Llammas are found in south America.

17.Bring out differences between De Vrie’s mutations Darwinian Variations?

Ans. (i) Mutations are large heritable changes in the characteristics of a population that arisesuddenly. & cause speciation in single step while evolution for Darwin is gradual & occurs due tovariations over number of generations.

(ii) Mutation are random & directionless while variations are small & directional.

CBSE Class 12 Biology
Important Questions
Chapter 7
Evolution

5 Marks Questions

1. What does Hardy weinberg's principle states? What are the factors which affects Hardyweinberg's equilibrium?

Ans. Acc. to Hardy Weinberg's principle, allele frequency in a population are stable & is constantfrom generation to generation i.e. total gene pool remains constant. This is called Geneticequilibrium e.g. In a diploid organism, suppose 'p' represents frequency of allele 'A' & 'q' representsfrequency of allele 'q'.then frequency of AA = p2

" " Aa =pq

" " aa = q2

total alleles in F1 Generation

AA + 2Aa + aa = 1

P2 + 2pq + q2 = 1

(p + q) 2 = 1

Factors affecting Hardy – Weinberg Equilibrium :-

(i)Gene flow :- when migration of a section of a population to another place occurs, gene frequency changes in original as well as in new population.

(ii)Genetic Drift :- If just by virtue of a chance or accident a particular allele frequency decrease or increase in a population.

(iii)Mutations:- which are sudden changes in the genotype which are carried over generation.

(iv)Genetic Recombination:- Sometimes changes in allele frequency is so different in new sample of population that they become a new species.

(v)Natural Selection:- process by which individual with particular heritable characteristics survive & reproduces at higher rate than other individuals favored by natural selection tend to be more common in next generation than in parent generation.

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2. How do Darwin and Hugo de Vries after regarding Mechanism of Evolution?

Ans. Darwin : Darwinian variatious are gradual, small and directional Hugo deVries : put forth idea of mutations, mutations are sudden random and directional

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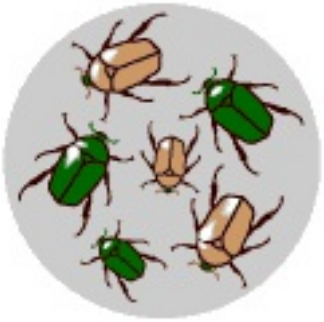
3. With the help of suitable diagram, represent the operation of naturalselection on different traits.

Ans. Natural selection is one of the basic mechanisms of evolution, along with mutation, migration, and genetic drift.

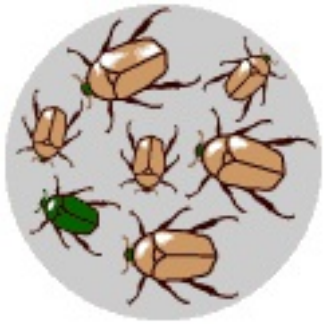
Darwin's grand idea of evolution by natural selection is relatively simple but often misunderstood. To find out how it works, imagine a population of beetles:
1. There is variation in traits.



For example, some beetles are green and some are brown.
2. There is differential reproduction.

Since the environment can't support unlimited population growth, not all individuals get to reproduce to their full potential. In this example, green beetles tend to get eaten by birds and survive to reproduce less often than brown beetles do.

3. There is heredity.



The surviving brown beetles have brown baby beetles because this trait has a genetic basis.

4. End result:

The more advantageous trait, brown coloration, which allows the beetle to have more offspring, becomes more common in the population. If this process continues, eventually, all individuals in the population will be brown.

If you have variation, differential reproduction, and heredity, you will have evolution by natural selection as an outcome. It is as simple as that.

4.What does Oparin – haldane hypothesis about origin of life suggests.

Ans. According to Oparin& Haldane's Biochemical origin of life; origin of life occurs in three

stages

5.What is Chemogeny?

Ans. CHEMOGENY / CHEMICAL EVOLUTION :-Acc to them most of the primitive form of life would have generated spontaneously from some inorganic matter as a result of action of special external forces e.g. electric charge, uv-light etc.

1. Many saturated & unsaturated hydrocarbons were feasted when temp cooled to 900 c or below.
2. From hydrocarbons small chain compounds of C, H, O are formed which condense to form sugar.
3. Ketones & aldehydes condenses&polymerises to form fatty acid.
4. Ammonia, hydrocarbon & H2 O reacted together to form amino acid.
5. Hot sea water which was rich in primary organic compound reacted to form nucleotides.

6. What is biogeny?

Ans. BIOGENY / BIOLOGICAL EVOLUTION :- This stage consists of

i)Formation of nucleic acids by polymerization of nucleotide.

ii)Giant molecules of nucleoproteins have a tendency to be aggregated in various combinations to form large colloidal particles called COACERVATES.

iii)The development of plasma membrane resulted in accumulation of different substances inside coacervates& occurrence of certain internal reaction lad to development of cell.

7. Whai is Cognogeny?

Ans. Cognogeny :-Cognogeny involves differentiation or diversification of living beings from simplest first living cell. The first organism evolved was chemo- autotrophic bacteria which later converted to tree autotrophic bacteria e.g. green algae.