KASIDIH HIGH SCHOOL

POST: SAKCHI, JAMSHEDPUR

(Affiliated up to +2 level to C.B.S.E., New Delhi)
Affiliation No. - 3430143

XII-Biology

Chapterwise Topicwise Worksheets with Solution

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Index

CBSE TEST PAPER-01

CLASS - XII BIOLOGY (Reproduction in Organisms)

1.	What represents the life span of an organism?	(1)
2.	Which individuals can be termed as clones?	(1)
3.	How do the following organisms reproduce: Paramoecium and Penicillium?	(1)
4.	State the function of a vegetative propagule.	(1)
5.	How will you grow a banana and a ginger plant?	(1)
6.	Enlist the significance of reproduction.	(2)
7.	Why do hilly areas of Kerela, Karnataka and Tamil Nadu transform into blue stretches that attracts many tourists?	(2)
8.	Define 'oestrus' and 'menstrual' cycles.	(2)
9.	What regulates the reproduction processes and the associated behavioural expressions in organisms?	(2)
10.	Mention the different stages of sexual reproduction.	(2)
11.	What are heterogametes? What do we call these gametes individually?	(3)
12.	Why is syngamy a major event in sexual reproduction?	(3)
13.	What happens during embryogenesis?	(3)
14.	Give any three differences between asexual and sexual reproduction.	(3)
15.	Enlist the changes that occur post- fertilization in plants.	(3)

CBSE TEST PAPER-01

CLASS - XII BIOLOGY (Reproduction in Organisms)

[ANSWERS]

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

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

3. a) Paramoecium reproduces by the process of binary fission.
   b) Penicillium reproduces with the help of asexual structures called conidia.

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

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

6. 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.

7. *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.

8. 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.

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

10. The different stages in sexual reproduction include:
    - Pre- fertilization events.
    - Fertilization.
    - Post – fertilization events.

11. Most of the sexually reproducing organisms produce two morphologically distinct gametes called heterogametes.
The male gamete is called antherozoid or sperm and the female gamete is called egg or ovum.

12. The fusion of the male gamete with the female gamete is called syngamy or fertilization and plays and important role in exchange of genetic material to introduce variation and results into formation of diploid zygote.

13. 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.

14.

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.

15. 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.

CBSE TEST PAPER-02

CLASS - XII BIOLOGY (Sexual Reproduction in Flowering Plants)

1.	What kind of structures is formed at the end of microsporogenesis and megasporogenesis?	(1)
2.	What is funiculus?	(1)
3.	Define parthenocarpy.	(1)
4.	What is microsporogenesis?	(1)
5.	Why is emasculation done in the process of hybridization?	(1)
6.	Describe the structure of a microsporangium with a neatly labeled diagram.	(2)
7.	Why pollen grains can remain well preserved as fossils?	(2)
8.	How are the cells arranged in an embryo sac?	(2)
9.	Why are cleistogamous flowers invariably autogamous?	(2)
10.	State any one advantage and disadvantage of pollen grains to humans.	(2)
11.	Differentiate between microsporogenesis and megasporogenesis.	(3)
12.	Explain the stages involved in the maturation of a microspore into a pollen grain.	(3)
13.	What is triple fusion? Where does it occur?	(3)
14.	Explain the structure of an anatropous ovule with a neat labeled diagram?	(3)
15.	Explain the formation of an embryo sac with diagrams.	(5)

CBSE TEST PAPER-02

CLASS - XII BIOLOGY (Sexual Reproduction in Flowering Plants)

(Answer Key)

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

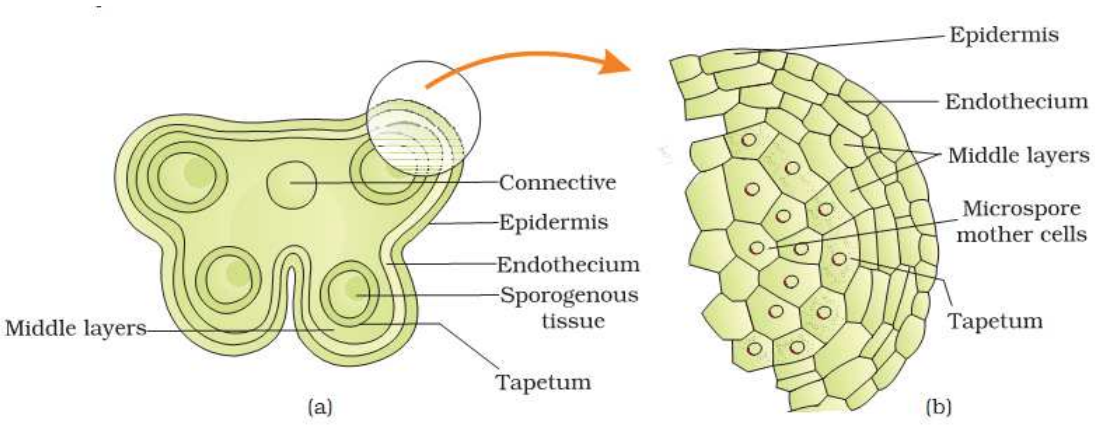
2. The stalk of the ovule is called funiculus.

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

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

5. 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.

6. 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.



7. 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

8. 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.

9. 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.

10. 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.

11.

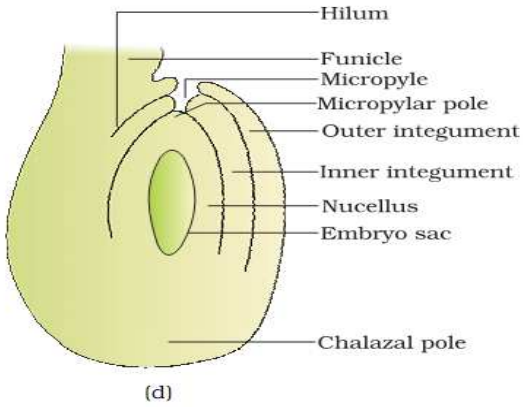
Microsporogenesis	Megasporogenesis
1. It is the formation of haploid microspores or pollen grains from the diploid microspore mother cell.	1. it is the formation of megaspores from the diploid megaspore mother cell.
2. The pollen grains are arranged in tetrahedral tetrad.	2. The megaspores are arranged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

12. 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.

13. 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.

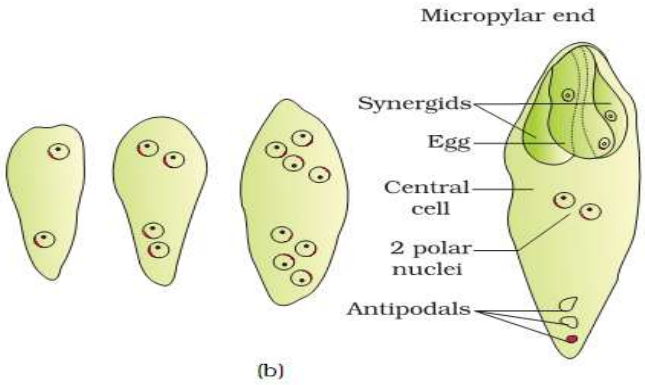
14. An anatropous ovule consists of:

- 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.



(d)

15. -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.



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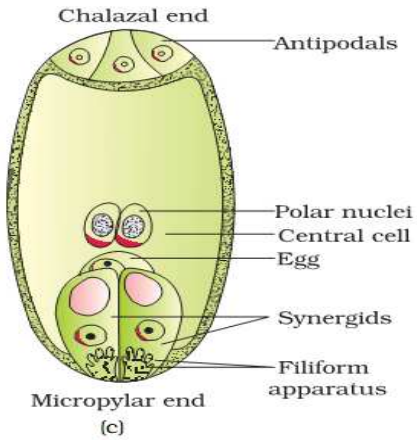


(c)

CBSE TEST PAPER-03

CLASS - XII BIOLOGY (Sexual Reproduction in Flowering Plants)

1.	What do you understand by double fertilization?	(1)
2.	What is sporopollenin?	(1)
3.	Name one plant each where pollination occurs with the help of a) Water. b) Bats	(1)
4.	Why do most zygotes develop after certain amount of embryo is formed?	(1)
5.	What is polyembryony?	(1)
6.	State the characteristics of insect pollinated flowers.	(2)
7.	Differentiate between chasmogamous and cleistogamous flowers	(2)
8.	Which type of pollination ensures the arrival of genetically different pollen grains to stigma?	(2)
9.	What relationship exists between a species of moth and Yucca plant?	(2)
10.	Describe the structure of a pollen grain.	(3)
11.	Enlist the advantages offered by seeds to angiosperms.	(3)
12.	Give any three advantages of sexual incompatibility.	(3)
13.	Explain the development of embryo in a dicotyledonous plant with neatly labeled diagrams.	(5)

CBSE TEST PAPER-03

CLASS - XII BIOLOGY (Sexual Reproduction in Flowering Plants)

(Answer Key)

1. 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.

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

3. Water pollinated: *Vallisneria* and *Hydrilla.*
Bat pollinated: *Anthocephalous* and *Bauhinia megalandra*.

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

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

6. 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.

7.

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.

8. 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.

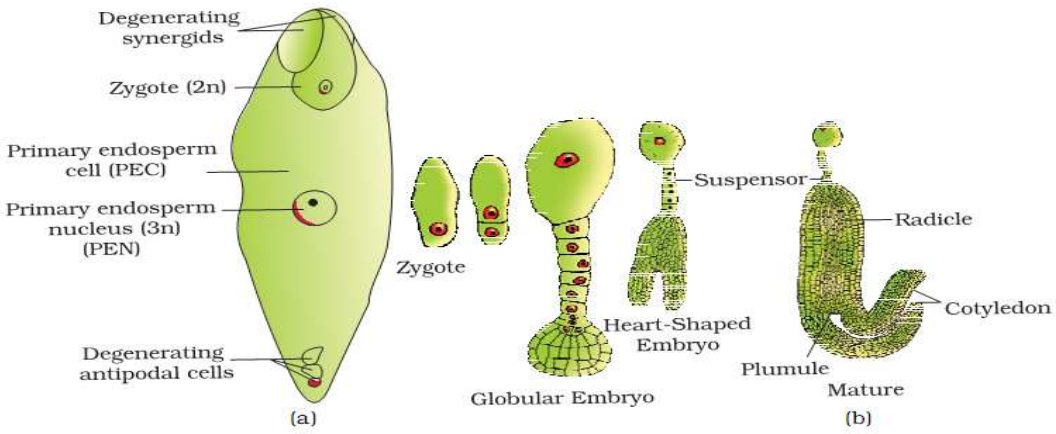
9. There exists a relationship between moth and *Yucca* plant. The moth deposits its egg in the locule of the ovary and in turn pollinates the flower of the plant. The larvae develop from the eggs as the seeds start developing.

10. -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 intine which is composed of cellulose and pectin.
- a mature pollen grain has a vegetative cell and a generative cell.

11. 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.

12. 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.

13. 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



CBSE TEST PAPER-04

CLASS - XII BIOLOGY (Human Reproduction)

1.	Why are male testes located outside the abdominal cavity?	(1)
2.	State the function of leydig cells.	(1)
3.	Where do we find fimbriae?	(1)
4.	What is semen?	(1)
5.	Define parturition.	(1)
6.	Describe the structure of a sperm with a diagram.	(2)
7.	Enlist any two functions of a female placenta.	(2)
8.	What is the number of chromosomes in the following cells? Primary oocyte, secondary oocyte, ootid and follicle.	(2)
9.	What are the various male accessory glands? Give their function.	(3)
10.	Explain the menstrual cycle with a diagram.	(3)
11.	Differentiate between spermatogenesis and oogenesis.	(3)
12.	'A fertilized egg is the blue print of future development'. Explain	(3)
13.	Explain the development of human embryo with diagrams.	(5)

CBSE TEST PAPER-04

CLASS - XII BIOLOGY (Human Reproduction)

(Answer Key)

1. 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.

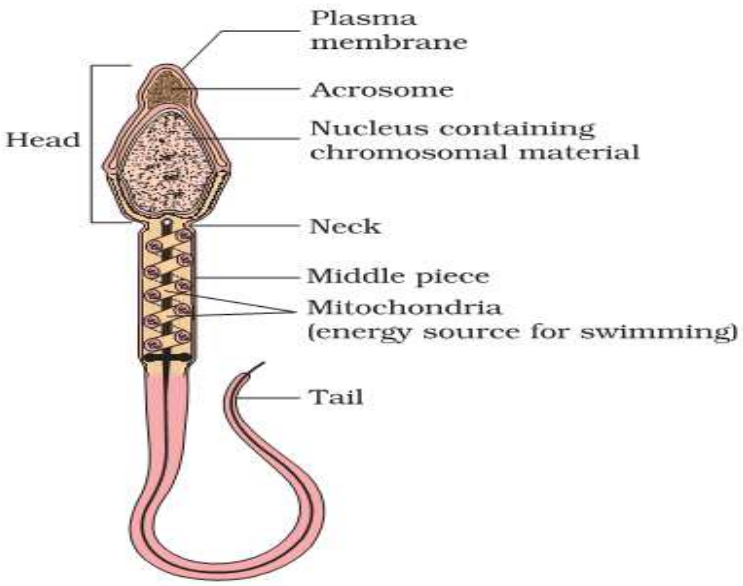
2. The leydig cells synthesise and secrete testicular hormones called androgens.

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

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

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

6. 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.



7. 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.

8. The number of chromosome in the cells is as follows:
   Primary oocyte: 23 pairs. Secondary oocyte: 23. Ootid: 23. Follicle: 23 pairs.

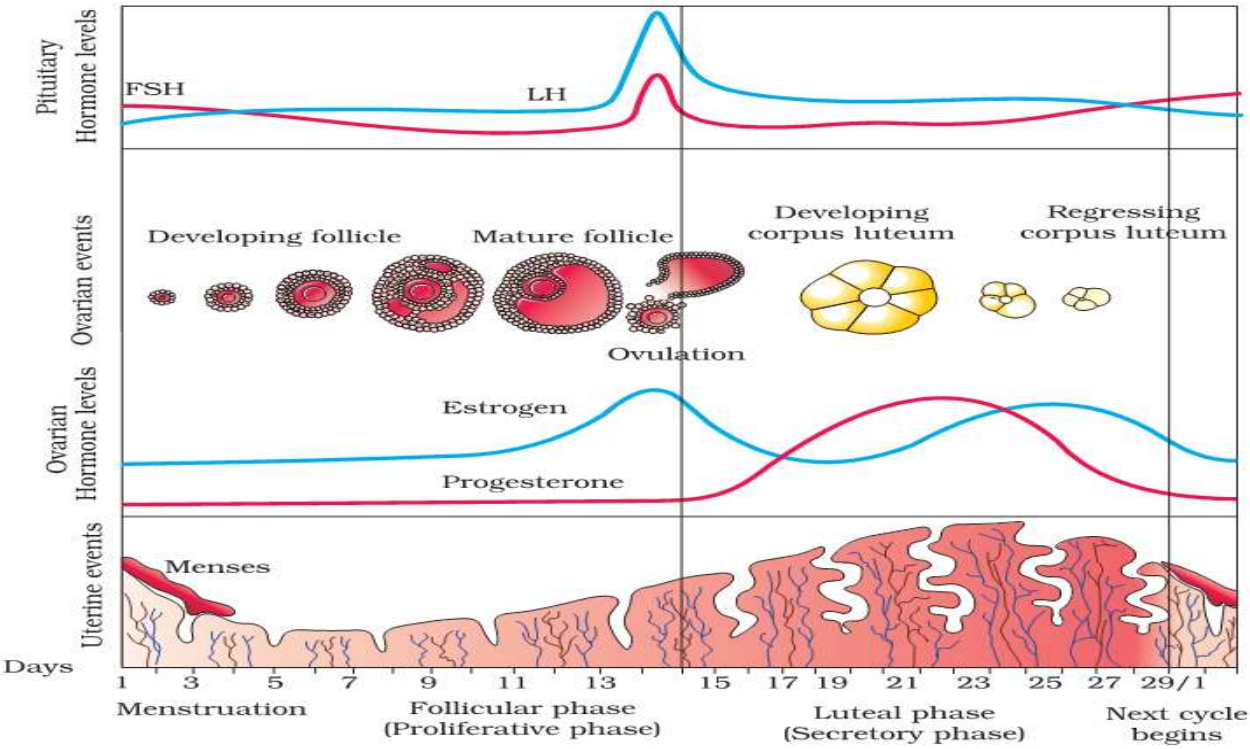
9. The male accessory glands include paired seminal vesicles, a prostrate gland and paired bulbourethral glands.
   These glands secrete seminal plasma rich in fructose, calcium and certain enzymes. Secretions of bulbourethral glands help in lubrication of the penis.

10. 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 6^{th} to 16^{th} 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 albicans.



11.

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 I to give rise to two secondary spematocytes	5. Primary oocyte undergoes meiosis I to give rise to one secondary oocyte and a 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.

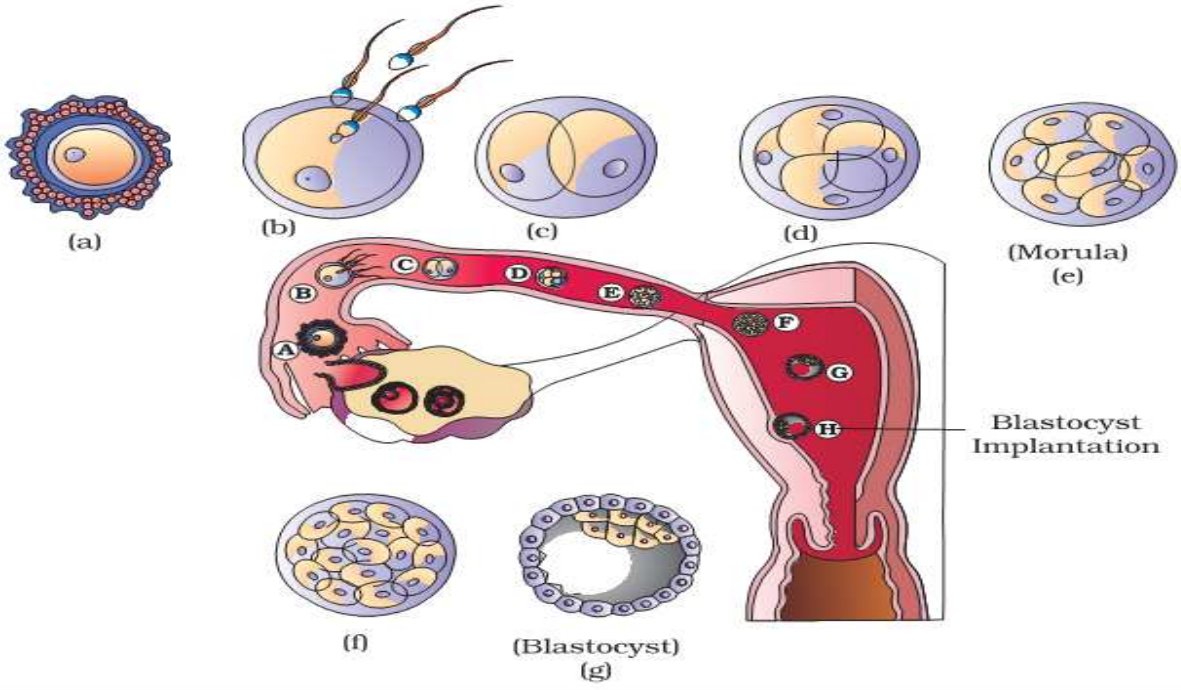
12. The sperm carries the genetic information from the father in form of 23 chromosomes (including the male sex chromosome X or Y) while the egg bears the genetic information from the mother (including the female sex chromosome X). Thus during fertilization the fusion of the male and the female gametes 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.

13. 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.



CBSE TEST PAPER-05

CLASS - XII BIOLOGY (Reproductive Health)

1.	What is the WHO's interpretation of reproductive health?	(1)
2.	Why has the Government imposed a statutory ban on amniocentesis?	(1)
3.	Expand MTP and ICSI.	(1)
4.	What does GIFT represent?	(2)
5.	How does Cu- T act as a contraceptive?	(2)
6.	Mention any four probable reasons for the rapid rise of population in our country?	(2)
7.	Identify the device used for the following methods of birth control: Barrier, IUD, Surgical technique and Administering hormone.	(2)
8.	What are STDs? Mention any two of it.	(2)
9.	Enlist any three causes of infertility in men and women.	(3)
10.	State the consequences of over population.	(3)
11.	Differentiate between natality rate and mortality rate.	(3)
12.	Explain any one natural method of birth control.	(3)
13.	Give three differences between tubectomy and vasectomy.	(3)

CBSE TEST PAPER-05

CLASS - XII BIOLOGY (Reproductive Health)

(Answer Key)

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

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

3. MTP: Medical Termination of Pregnancy.
ICSI: Intra Cytoplasmic Sperm Injection.

4. 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.

5. 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.

6. 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.

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

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

9. Reasons for infertility in men and women are:
1. Absence or blockage of vasa deferentia or vasa efferentia.in men
Non- ovulation or deficient ovulation in females can cause infertility.

2. Alcoholism inhibits spermatogenesis in men.
Inadequate growth and functioning of the corpus luteum in females.

3. Low fructose content ,high viscosity and low volume of ejaculation leads to male infertility.
Congenital malformation of the uterus also affects fertility.

10. 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.

11.

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.

12. 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.

13.

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.

CBSE TEST PAPER-06
CLASS - XII BIOLOGY (Sexual Reproduction in Flowering Plants)

1. Name the type of cross pollination in Vallisneria & Bougainvillea. [1]
2. How many haploid nuclei and haploid cells are present in female gametophyte of angiosperm? [1]
3. Mention the scientific term for the type of pollination which ensures Genetic Recombination. [1]
4. Differentiate between Geitonogamy & Allogamy. [2]
5. Draw a diagram of L.S. of an anatropous ovule of an Angiosperm & label the following parts :- [2]

   (i) Nucellus (ii) Integument

   (iii) Antipodal cells (iv) Secondary Nucleus.
6. Why is process of fertilization in flowering plants referred to as double fertilization? [2]
7. List any three differences between wind pollinated flower & insect – pollinated flower. [3]
8. Trace the development of microsporocyte into mature pollen grains. [3]
9. Describe the post-fertilization changes taking place in a flowering plant? [5]

CBSE TEST PAPER-06

CLASS - XII BIOLOGY (Sexual Reproduction in Flowering Plants)

Ans 1. (i) vallisneria - Hydrophily

(ii) Bougainvillea - Entomophily

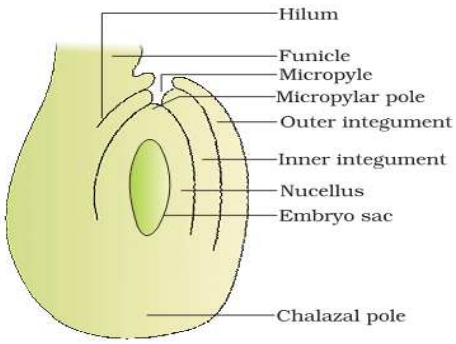
Ans 2. 8 – haploid nuclei and 7 – haploid cells.

Ans 3. Xenogamy or Allogamy

Ans 4.

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

Ans 5.



Ans 6. 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.

Ans 7.

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.

Ans 8. i) When the anther is young, the microsporangium contains compactly arranged homogenous cells forming the Sporogeneous tissues.

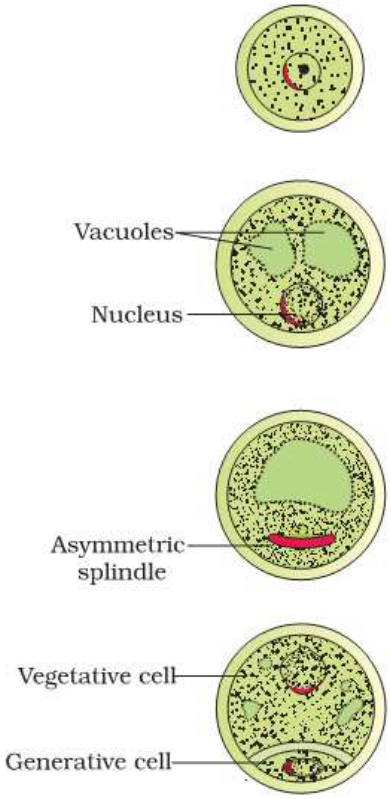
ii) Every cell of the sporogenous tissue is a potential Pollen mother cell (PMC) & give rise to microspore tetrad or Pollen grains.

iii) But Some of them forego this Potential & become differentiated into pollen or microspore mother cell (MMC)

iv) Each microspore mother cell undergoes meiosis to form a cluster of four haploid cells called microspore tetrad.

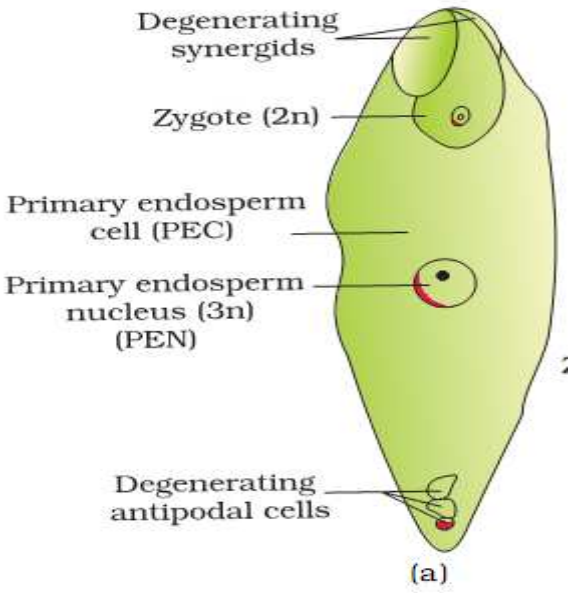
v) As the anther matures, microspores dissociate from tetrad & develop into pollen grains.

vi) 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.

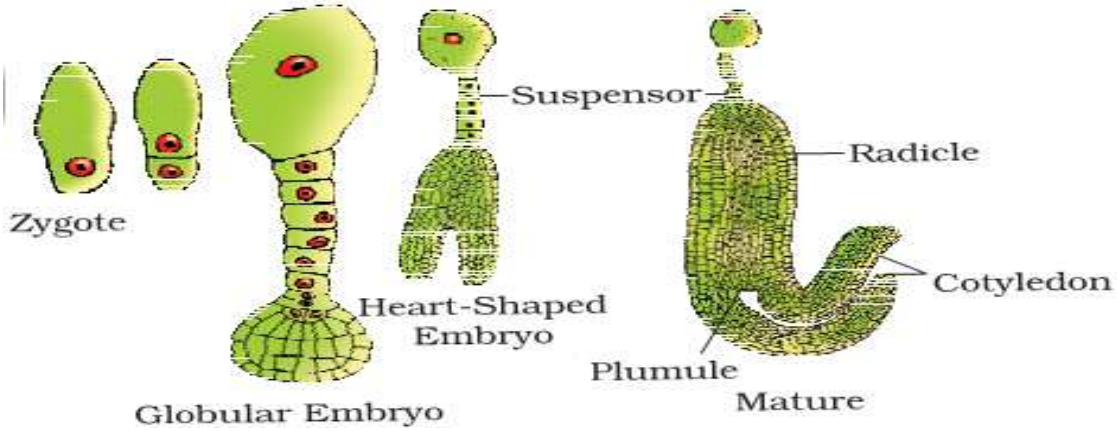


Ans 9. The major events taking place in a flowering plant after fertilization:-

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.



iii) MATURATION OF OVULE INTO SEEDS :- Seed is a matured ovule. It consists of seed coat, one or two cotyledons & an embryonal axis. Seed coat is formed lay integuments outer integument forms testa & inner integument forms tegmen. Micropyle is a small opening found at the seed coat which facilitates entry of water & oxygen.

iv) MATURATION OF OVARY INTO FRUIT :-On maturation ovary enlarges many times its size & becomes fruits. The ovary wall becomes fruit wall or pericarp. If an ovary develops into fruit without fertilization, it is called parthenocarpic fruit.

CBSE TEST PAPER-07

CLASS - XII BIOLOGY (Sexual Reproduction in Flowering Plants)

1. Which are the nuclei that fuse to form endosperm? [1]
2. Give an example of Bat – Pollinated flower. [1]
3. Why are pollen grains produced in enormous quantity in maize? [1]
4. What are cleistogamous flowers? Can cross – pollination occurs in cleistogamous flowers. Give reason? [2]
5. Draw a labeled diagram of mature embryo sac & label the following [2]

   i) Egg cell ii) Antipodal cells iii) Synergids iv) Polar nuclei
6. Mention two strategies evolved lay flowers to prevent self-pollination [2]
7. i) Explain the structure of a maize grain with the help of a diagram [3]

   ii) Why cannot we use the term maize seeds for maize grains?
8. Trace the development of megasporocyte into mature ovule. [3]
9. 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. [5]

CBSE TEST PAPER-07

CLASS - XII BIOLOGY (Sexual Reproduction in Flowering Plants)

[ANSWERS]

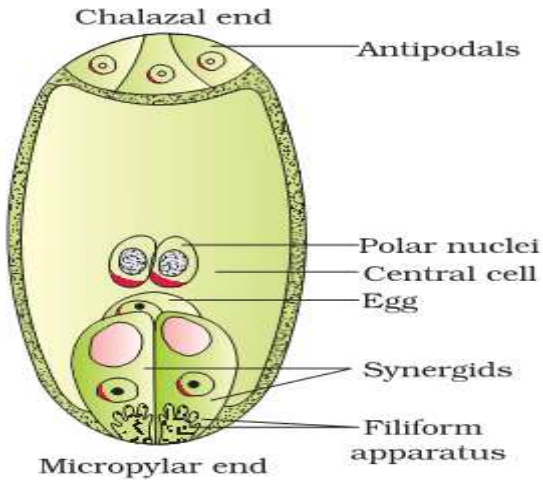
Ans 1. The second male gamete fuses with secondary nucleus (which is formed by fusion of two polar nuclei) to form a triploid primary endosperm.

Ans 2. Adansonia digitata.

Ans .3 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.

Ans 4. 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.

Ans 5.

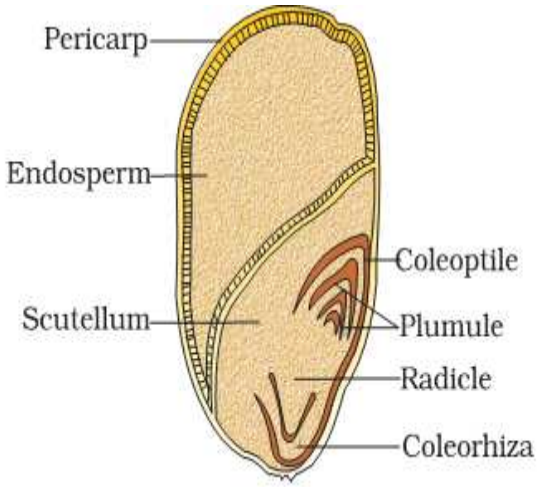


Ans 6. Two strategies evolved lay flowers to prevent self-pollination

(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.

Ans 7. (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.

Ans 8. 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.

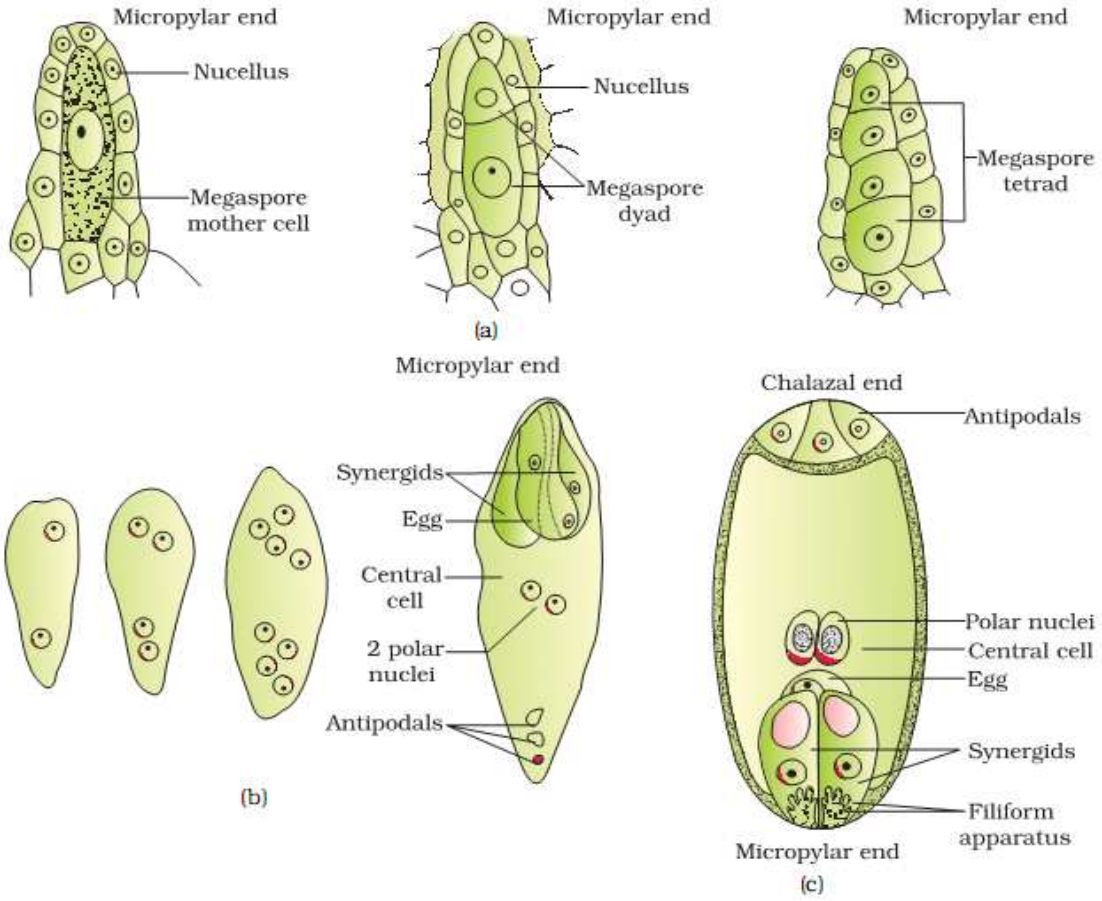
iii. Two successive mitotic divisions in each of these two nuclei results in formation of 8-nucleate embryo sac.

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.

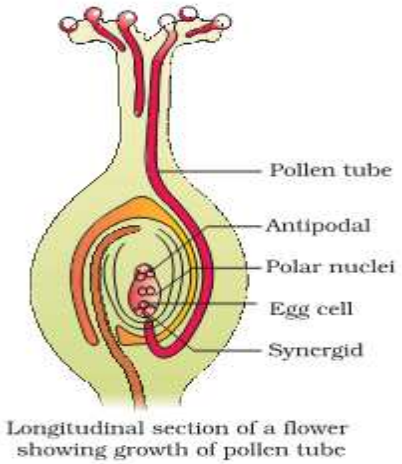
vi. The remaining two nuclei are called Polar nuclei, they move to centre of embryo sac & fuse to form Secondary nucleus.

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



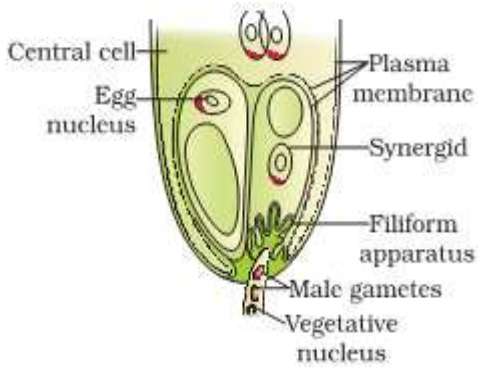
Ans 9. i) GERMINATION OF POLLEN GRAINS ON STIGMA

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.

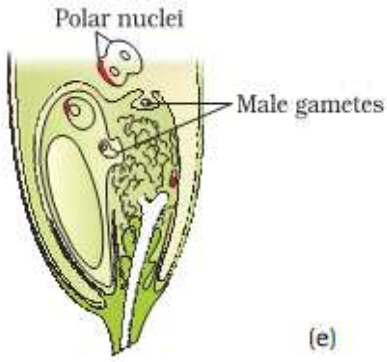


Longitudinal section of a flower showing growth of pollen tube

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.

CBSE TEST PAPER-08

CLASS - XII BIOLOGY (Sexual Reproduction in Flowering Plants)

1. Name the part of an angiosperm flower in which development of male & female gametophyte takes place. [1]
2. Why apple is called a false fruit. Which part of plant forms the fruit? [1]
3. Name the part of plant producing seed & fruit after fertilization. [1]
4. What is apomixis? What is its importance? [2]
5. Draw a well labeled diagram of longitudinal section of pistil showing pollen germination? [2]
6. List the advantages of pollination to angiospermic plants? [2]
7. "Incompatibility is the natural barrier in fusion of gamete". Justify this statement. [3]
8. How dose pollination takes place in salivia. List any four adaptations required for such type of pollination. [3]
9. i) Why is zygotes dominant for sometime in fertilized ovule. [5]

   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

CBSE TEST PAPER-08

CLASS - XII BIOLOGY (Sexual Reproduction in Flowering Plants)

[ANSWERS]

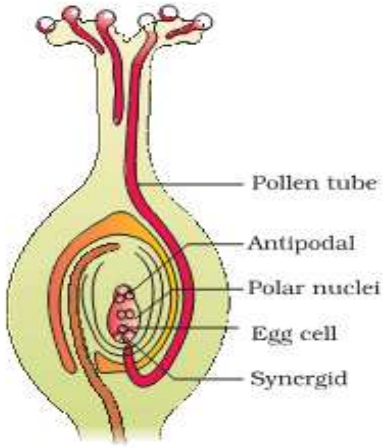
Ans1. Development of male gametophyte takes place in microspore in pollen grains & development of female gametophyte occurs in megaspore in ovule.

Ans2. Apple is called a false fruit because it develops from ovary along with accessory floral plants e.g. Thalamus

Ans3. After fertilization, ovule develops into seed & ovary develops into fruit.

Ans4. 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.

Ans5.



Longitudinal section of a flower showing growth of pollen tube

(c)

Ans6. i) Pollination leads to fertilization & production of seeds & fruits which are necessary for continuity of life.

ii) It is important for new varieties of plants.

iii) It is important for production of hybrid seeds.

iv) It helps in genetic recombination in plants.

Ans7. 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 :-

i) Pollen Stigma interaction: - In this phenomenon, pollen grains fails to germinate on Stigma because of incompatibility.

ii) 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.

iii) Pollen – ovule interaction: - pollen tube successfully pierces & grows within style & its growth is inhibited at micropyle of ovule.

Ans8. 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 :-

i) Flowers are brightly coloured.

ii) Flowers possess nectar glands.

iii) pollen grains are usually sticky & spiny

iv) flowers are large – sized & stout

Ans 9 (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 TEST PAPER-09

CLASS - XII BIOLOGY (Human Reproduction)

1. Where does fertilization normally takes place in a human female. [1]
2. Name the substance present in the sperm acrosome & which help in sperms entry into egg. [1]
3. Name the layer of cells that forms the outer wall of blastocyst [1]
4. What is corpus luteum. How dose it functions as endocrine gland? [2]
5. Where are leydig cells located? What do they secrete? [2]
6. Draw well labeled diagram of T.S. of ovary? [2]
7. Briefly describe the stages of spermatogenesis in human? [3]
8. Describe the hormonal control of human male reproduction system with the help of a flow chart & highlight the inhibitory & stimulatory directions in it? [3]
9. What is menstruation? What are the specific actions of FSH, LH, estrogen & progesterone in menstrual cycle? [5]

CBSE TEST PAPER-09

CLASS - XII BIOLOGY (Human Reproduction)

[ANSWERS]

Ans1. Ampulla (fallopian tube).

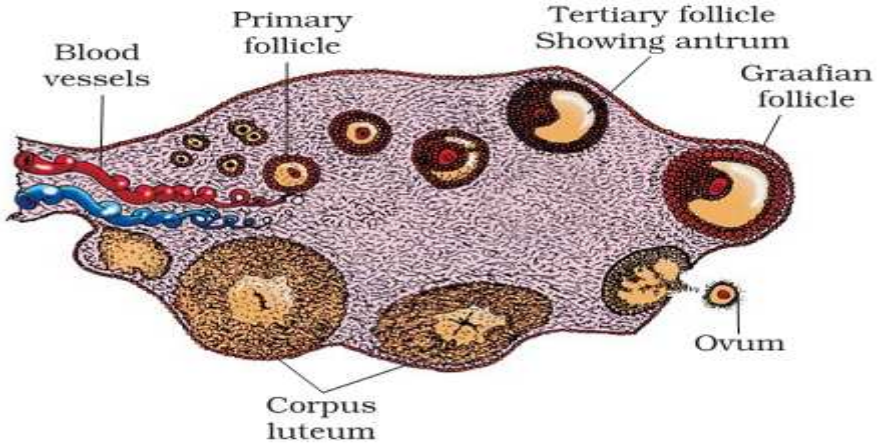
Ans2. Acrosome contains enzymes e.g. hyaluronidase that helps in dissolving membrane of ovum.

Ans3. Trophoblast.

Ans4. After ovulation, the graffian follicle ruptures & forms corpus luteum. Corpus luteum functions as endocrine glands as they secrete progesterone & estrogen in large quantities.

Ans5. 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.

Ans6.



Ans7. Spermatogenesis consists of two phases:-

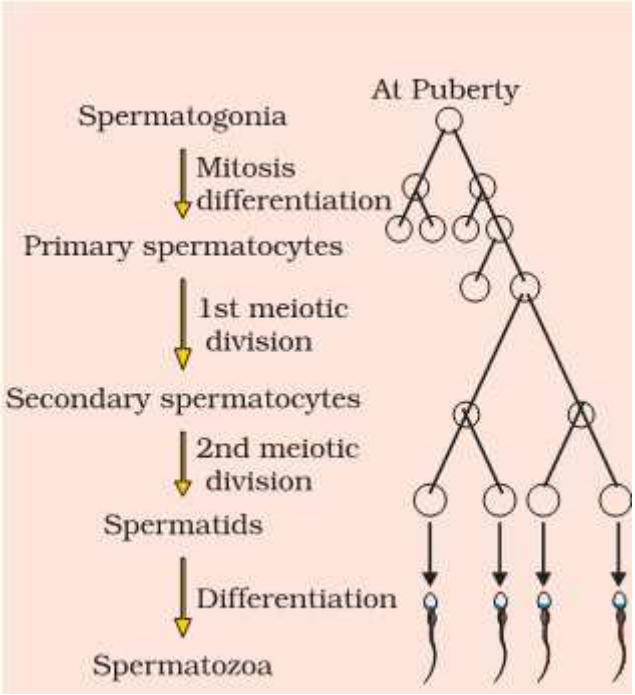
I. FORMATIDN OF SPERMATIDS :- It further consist of 3 phases

i) Multiplication phase :- undifferentiated germ cells undergo repeated division to produce sperm mother cell or spermatogonia.

ii) Growth phase :- Spermatogonia increase in volume & is now called PRIMARY SPERMATOCYTES.

iii) 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

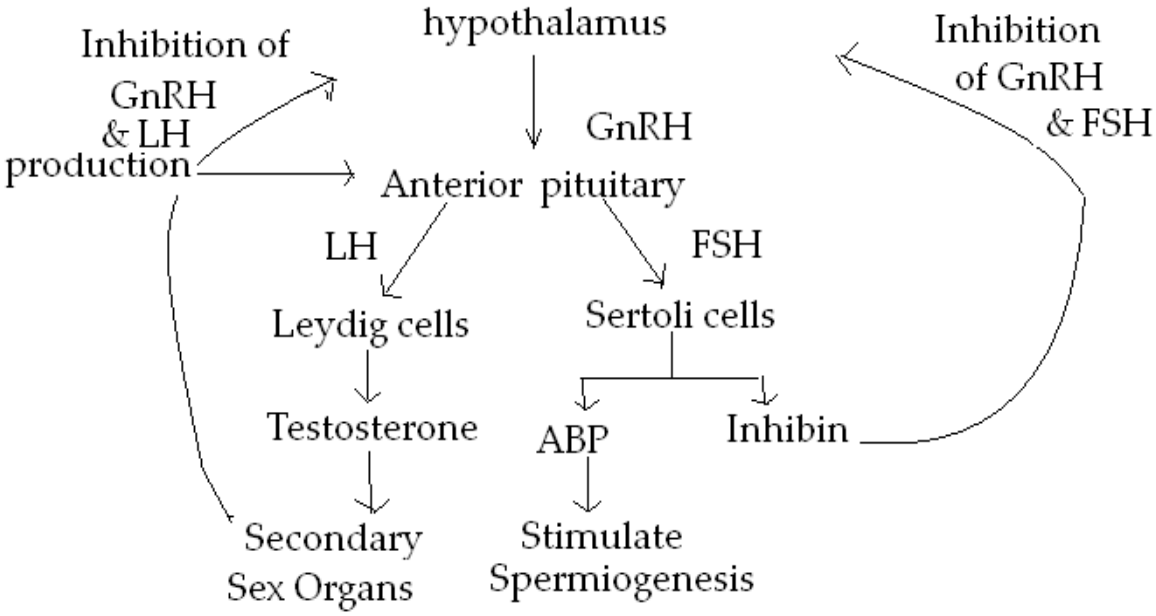


Ans8. i) Spermatogenesis is initiated due to an increase in the secretion of Gonadotropin releasing hormone from hypothalamus at the age of puberty.

ii) The increased levels of GnRH act on anterior pituitary& stimulate the secretion of two gonadotropins i-e. leuteinizing hormone (LH) & follicle stimulating hormone (FSH)

iii) LH acts on leydig cells & stimulate them to secrete testosterone

iv) FSH acts on sertoli cells & stimulate secretion of some factors help in spermiogenesis



Ans9. 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.

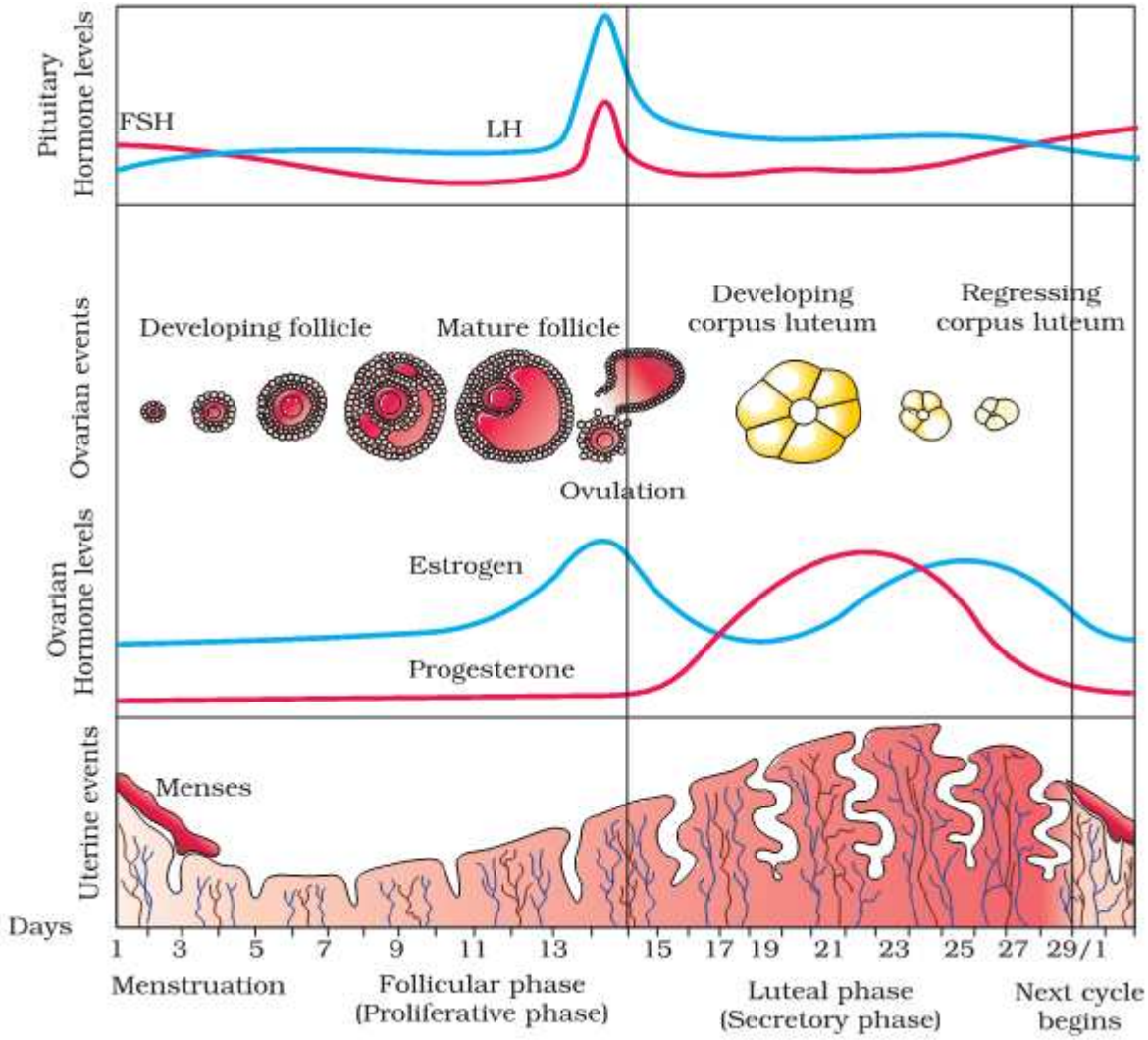
During menstrual cycles, the various changes occurs in the ovary under the influence of various hormones :-

i) Menstrual phase :- The levels of hormones LH ,FDH estrogen & progesterone is very less which results in breakdown of endometrial lining of uterus.

ii) 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)

iii) 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

iv) 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



CBSE TEST PAPER-10

CLASS - XII BIOLOGY (Human Reproduction)

1. At what stage is the mammalian embryo implanted in uterus? [1]
2. Despite the presence of So many sperms in the vicinity of an egg cell, only one sperm enters the ovum. Why? [1]
3. How many polar bodies are given out in production of one egg during cogenesis? [1]
4. Why testes of human males are considered extra abdominal? What is the significance of this condition? [2]
5. Draw a diagram of the T.S. of seminiferous tubule of testis of an adult human male & label any four parts in it. [2]
6. What is colustrum? What is its significance to new born baby? [2]
7. 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. [3]
8. Where oogenesis does takes place. Describe the stages of this process? [3]
9. 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. [5]

CBSE TEST PAPER-10

CLASS - XII BIOLOGY (Human Reproduction)

[ANSWERS]

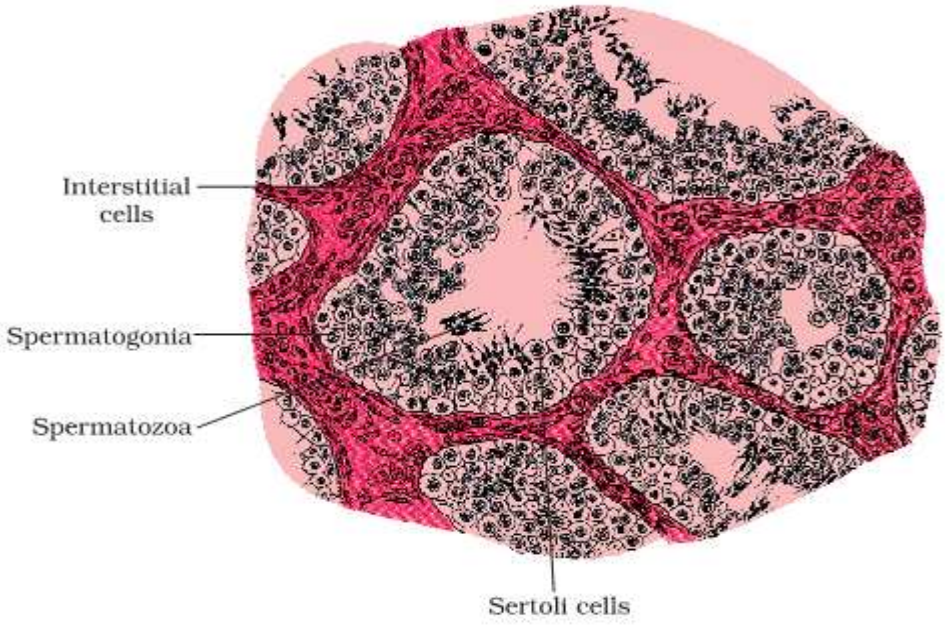
Ans 1. Blastocyst stage.

Ans 2. Because when a sperm comes in contact with ovum (zona pellucida) & induces changes in membrane to block entry of other sperms.

Ans 3. Two polar bodies

Ans 4. 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 2-3^{o}C lower than body temperature necessary for spermatogenesis.

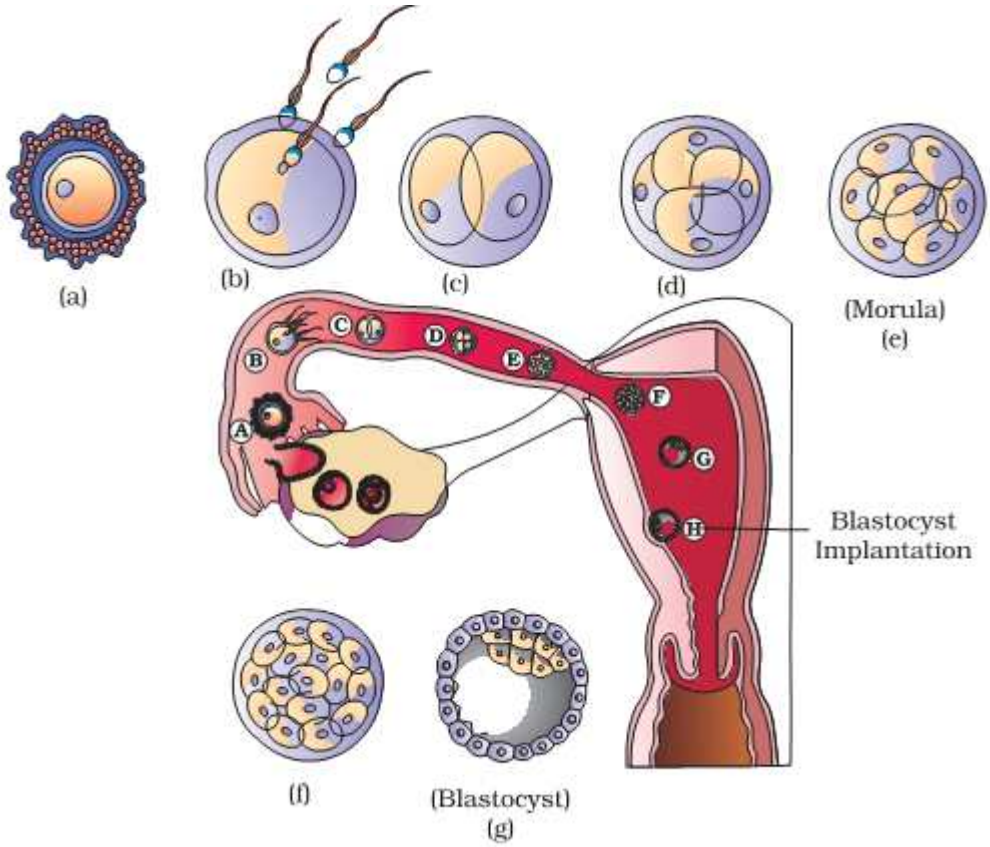
Ans 5.



Ans 6. 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.

Ans 7. 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 blastocoel is called blastula.



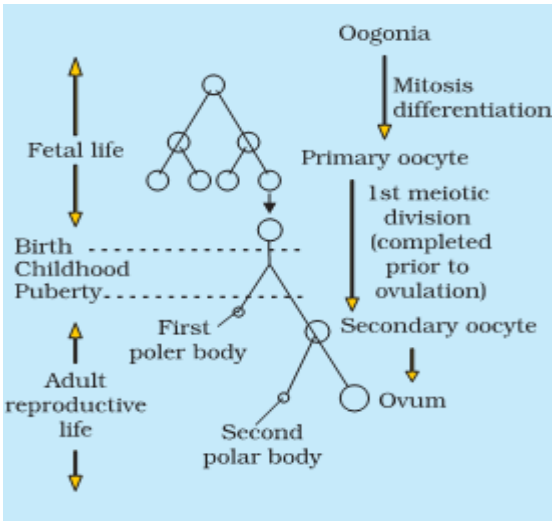
Ans 8. The process of formation & maturation of ovum is called oogenesis. It takes place in ovary & is initiated during embryonic development of female foetus.

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.



Ans 9. The following changes takes place in the body of women after implantation :-

i) The trophoblast differentiates into two layers outer layer secretes enzymes to dissolve the endometrium of uterus.

ii) 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.

iii) Placenta secretes hormones like HCG, HPL , estrogen & progesterone that are necessary to maintain pregnancy

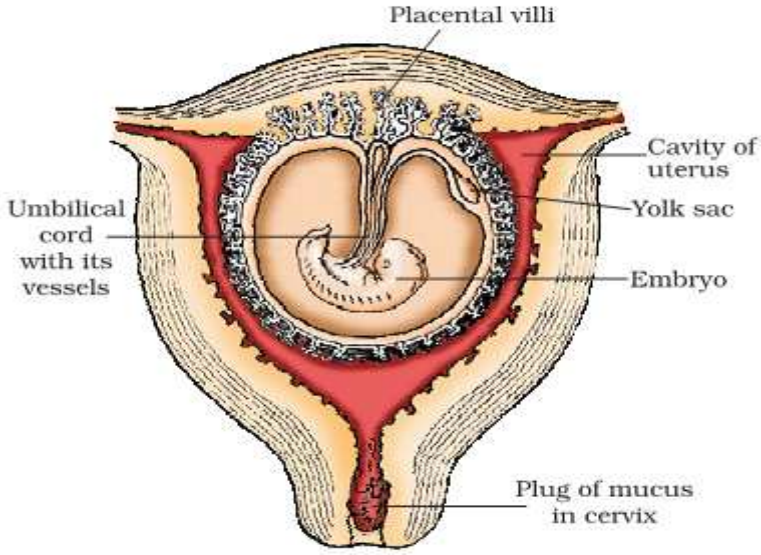
iv) Umbilical cord, the structure that connects the placenta with the foetus is formed.

v) Simultaneously, inner cell mass differentiates into outer layer called ectoderm & inner layer called endoderm. & a middle layer called mesoderm appears between ectoderm & endoderm.

vi) 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.

vii) By the end of ninth month of pregnancy, foetus is completely developed & is ready for delivery.

viii) 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 TEST PAPER-11

CLASS - XII BIOLOGY (Reproductive Health)

1. What is lactational amenorrhoea? [1]

2. Write the scientific name of causative agents of :-- [1]
   i) Syphillis ii) Gonorrhoea.

3. Name the technique by which one can disorder any possible chromosomal or metabolic disorders in foetus. [1]

4. Expand the following :-- i) GIFT ii) ICSI iii) IUCD [1]

5. "Removal of Gonads cannot be a contraceptive option". Why? [2]

6. What are MTPs ? Under what conditions MTPs are legally permitted? [2]

7. Describe the technique which is used for sex determination in foetus? [2]

8. What are test tube babies? Are they different from normal babies? [2]

9. Mention any four objectives of RCHC. [2]

10. Describe the three manners in which fertilization of human ovum by sperm can be prevented? [3]

11. Suggest some methods to assist infertile couples to have children? [3]

CBSE TEST PAPER-11

CLASS - XII BIOLOGY (Reproductive Health)

[ANSWERS]

Ans 1. It refers to absence of menstruation during period of intense lactation.

Ans 2. i) Treponema Pallidum

ii) Neisseria Gonorrhoea

Ans 3. Amniocentesis.

Ans 4. i) Gamete Intrafallopian transfer.

ii) Intra Cytoplasmic Sperm injection

iii) Intra uterine contraceptive devices.

Ans 5. 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 organs.

Ans 6. MTP refers to as medical termination of pregnancy. It is legalized in our country only:-

i) in case of rape.

ii) in case of casual unprotected intercourse

iii) in case pregnancy is harmful for foetus or for mother.

Ans 7. 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.

Ans 8. 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.

Ans 9. RCHC refers to a popular programme called “Reproductive & child health care (RCHC) & the major tasks under these programmes are :-

i) Creating awareness about various reproduction related aspects eg. STDs, birth control methods.

ii) Providing facilities & support for building up reproductive healthy society.

iii) Educating people about care of pregnant women, important of breast feeding.

iv) awareness about sex abuse & sex related crimes

Ans 10. I. NATURAL METHODS :-avoiding chances of meeting between the gametes.

i) Periodic Abstinence :-couples avoid coitus from 10-17th day of menstrual cycle when ovulation is expected.

ii) Lactational Amenorrhoea :- absence of menstruation during intense lactation.

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

i) Condoms :- barriers made up of thin rubber or latex sheath to cover penis in makes or cervix in females.

ii) Diaphragms cervical caps :- made up of rubber & are reusable

iii) Spermicidal creams along with these barriers

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

i) Vasectomy :- small portion of vas deferens is removed or tied up through incision in scrotum.

ii) Tubectomy :- small portion of fallopian tube is removed or tied up through vagina.

Ans 11. Three are special techniques called Assisted Reproductive Technologies (ART) to help infertile couples to have children:-

i) 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)

ii) 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

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

CBSE TEST PAPER-01

CLASS - XII BIOLOGY (Principle of Genetic Inheritance)

1. Name the phenomena that occur when homologous chromosomes do not separate during meiosis. [1]
2. Name one trait each in humans & in drosophila whose genes are located on sex chromosome. [1]
3. What is meant by aneuploidy? [1]
4. Give any two similarities between behavior of genes (Mendel's factor) during inheritance & chromosomes during cell division. [2]
5. Which law of Mendel is universally accepted? State the law? [2]
6. How will you find out whether a given plant is homozygous or heterozygous? [2]
7. In Antirrhinum majus a plant with red flowers was crossed with a plant with white flowers. Work out all the possible genotypes & phenotypes of F_1 & F_2 generations comment on the pattern of inheritance in this case? [3]
8. A red eyed male fruitfly is crossed with white eyed female fruitfly. Work out the possible genotype & phenotype of F_1 & F_2 generation. Comment on the pattern of inheritance in this cross? [3]
9. 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? [5]

CBSE TEST PAPER-01

CLASS - XII BIOLOGY (Principle of Genetic Inheritance)

[ANSWERS]

Ans 1. Non – disjunction.

Ans 2. Humans - Colorblindness

Drosophila - Eye colour

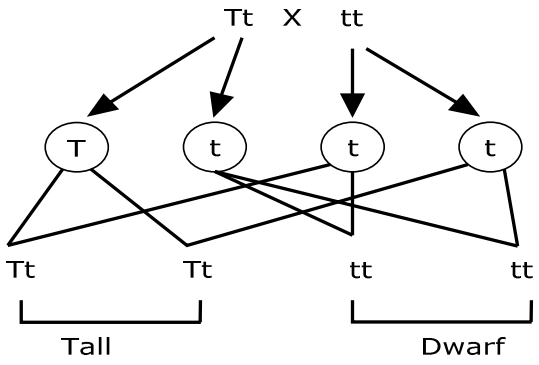
Ans 3. Aneuploidy is the phenomena of gain or loss of one or more chromosomes that results due to failure of separation of members of homologous pair of chromosomes during meioses.

Ans 4. i) In diploid cells, the chromosomes are found in pairs just like that of mendelian factors.

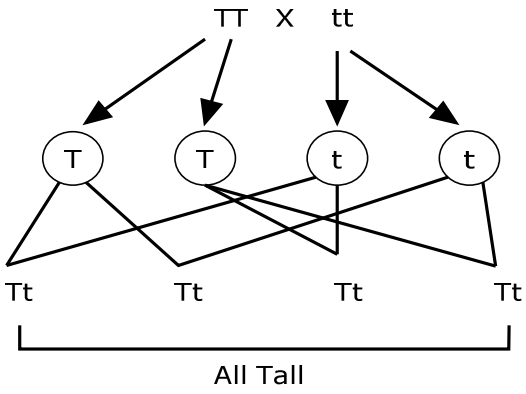
ii) During meiosis, the chromosomes of different homologous pairs are assorted independently into gametes at random showing parallelism with mendelian factors.

Ans 5. 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.

Ans 6. 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



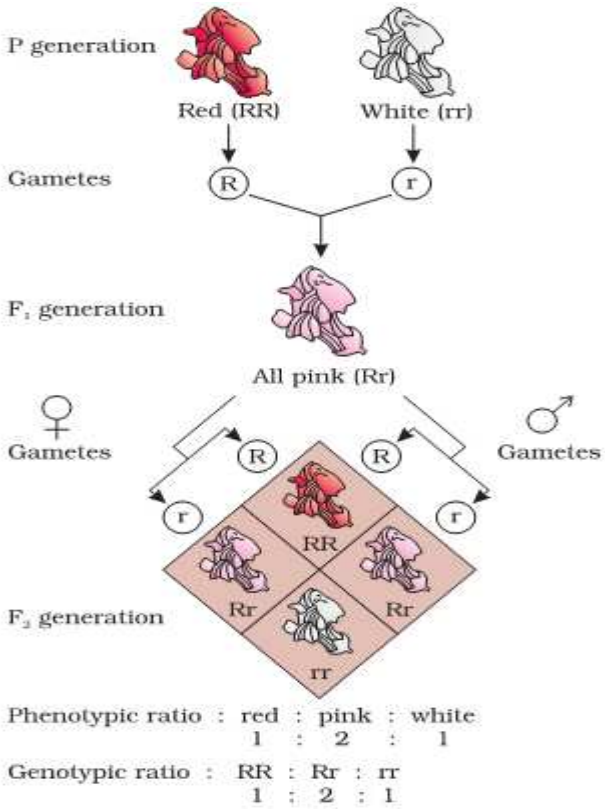
If plant is homozygous, progeny of test cross will have all tall plants



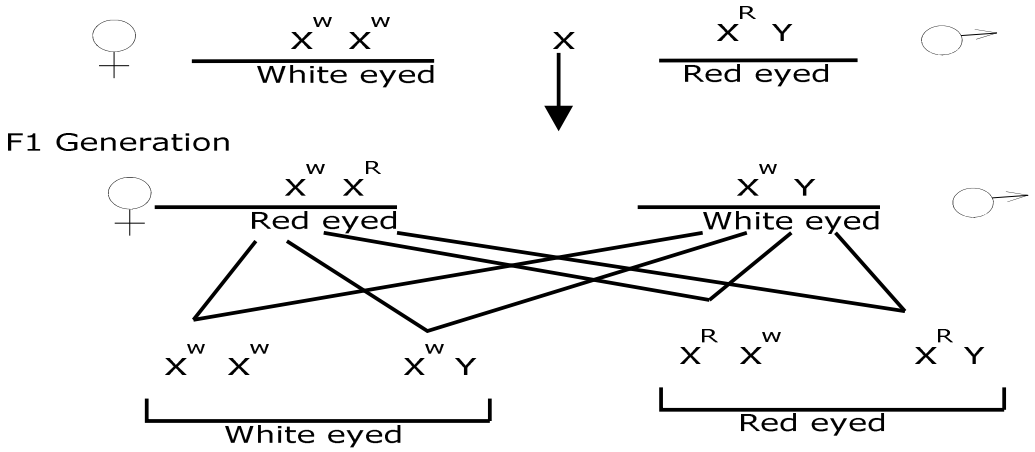
Ans 7. The inheritance of flower colour in snapdragon or Antirrhinum majus is an example of incomplete dominance. When a cross was made between a red flowered plant & a white flowered plant, the F_1hybrid was pink i-e-an intermediate between red & white which means that both red & white are incompletely dominant. When F_1 individuals was self – pollinated, the F_2 generation consists of red, pink & white flower appears in ratio 1:2:1 respectively.

Ans 8. 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 F_1 generation.

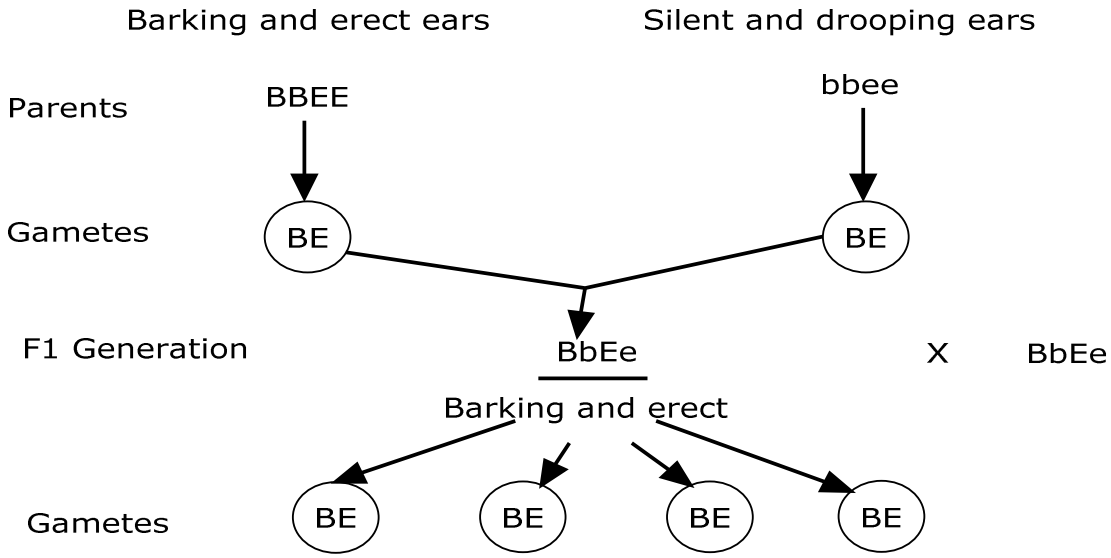
In F_2 generation, 50% females will be red – eyed & 50% will be white eyed, similarly, in males 50% will be red eyed & 50% will be white eyed.



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 –



Ans 9.



F1 Generation

	BE	Be	bE	be
BE	BBEE	BBEe	BbEE	BbEe
Be	BBEe	BBee	BbEe	Bbee
bE	BbEE	BbEe	bbEE	bbEe
be	BbEe	Bbee	bbEe	bbee

Ration :- Barking & erect = 9

Barking & drooping =3

Silent & erect = 3

Silent & drooping =1

Phenotypic ratio = 9 : 3 : 3 : 1

CBSE TEST PAPER-02

CLASS - XII BIOLOGY (Principle of Inheritance)

1. What genetic principle could be derived from a monohybrid cross? [1]
2. Which one change is the cause of sickle – cell anaemia ? [1]
3. What is a test cross? [1]
4. Why do sons of haemophilic father never suffer from this trait? [2]
5. 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? [2]
6. 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. [2]
7. A man with AB blood group marries a woman with O group blood. [3]
   (i) Work out all the possible phenotypes & genotypes of the progeny.
   (ii) Discuss the kind of domination in parents & progeny in this case?
8. In an cross made between a hybrid tall & red plant (TtRr) with dwarf & white flower (ttrr). What will be the genotype of plants in F_1 generation? [3]
9. Differentiate between dominance, co-dominance & Incomplete dominance with one example each. [5]

CBSE TEST PAPER-02

CLASS - XII BIOLOGY (Principle of Inheritance)

[ANSWERS]

Ans1. Law of dominance.

Ans2. It is caused due to a point mutation at 6^{th} position in B-chain of hemoglobin in which glutamic acid is replaced by valine.

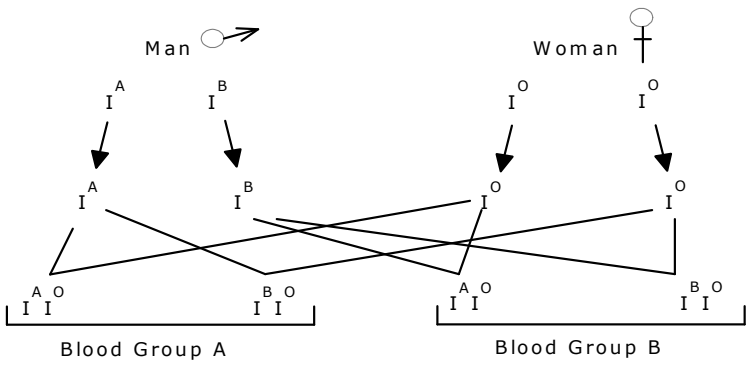
Ans3. It is a cross where offspring with dominant phenotype whose genotype is not known is crossed with an individual homozygous recessive for the trait.

Ans4. 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.

Ans5. 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.

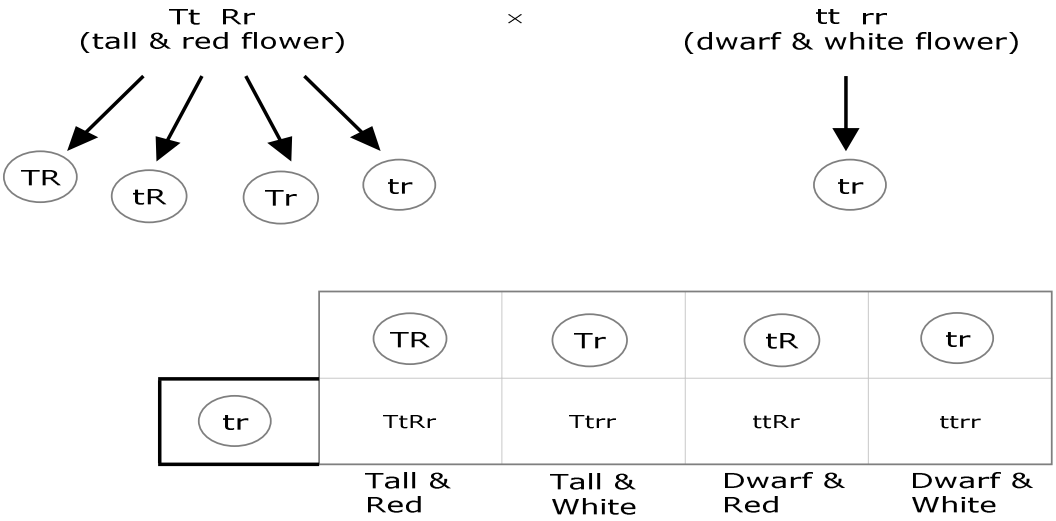
Ans6. C& D will show maximum gene recombination because genes which are more closely linked, frequency of recombination is least & vice versa.

Ans7. i) Half the progeny will have blood group A with genotype $I^A I^O$ & half the progeny will have blood group B with genotype $I^B I^O$.



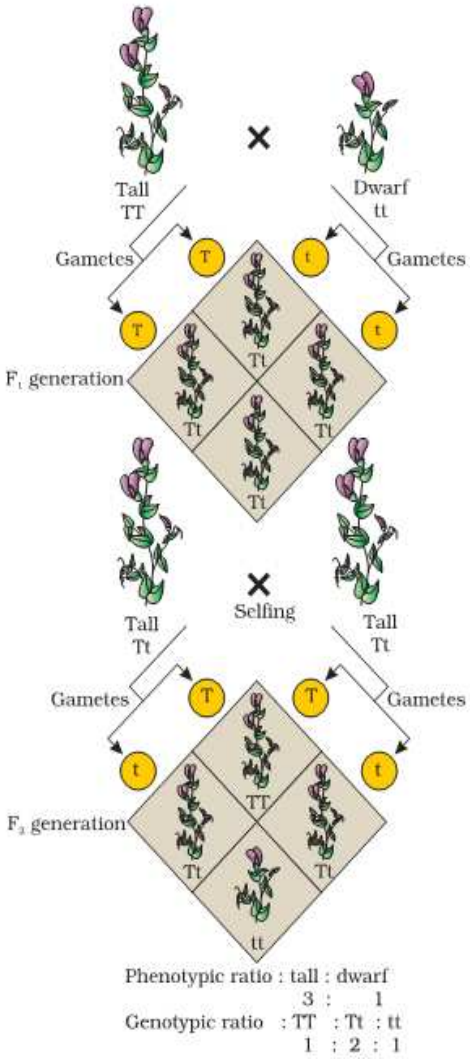
Ans7 ii) I^A & I^B both the genes are dominant over I^O gene hence progeny shows either blood group A or B while in parents since both the dominant genes are present together man will have blood group AB & this phenomena is called co-dominance.

Ans8.



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

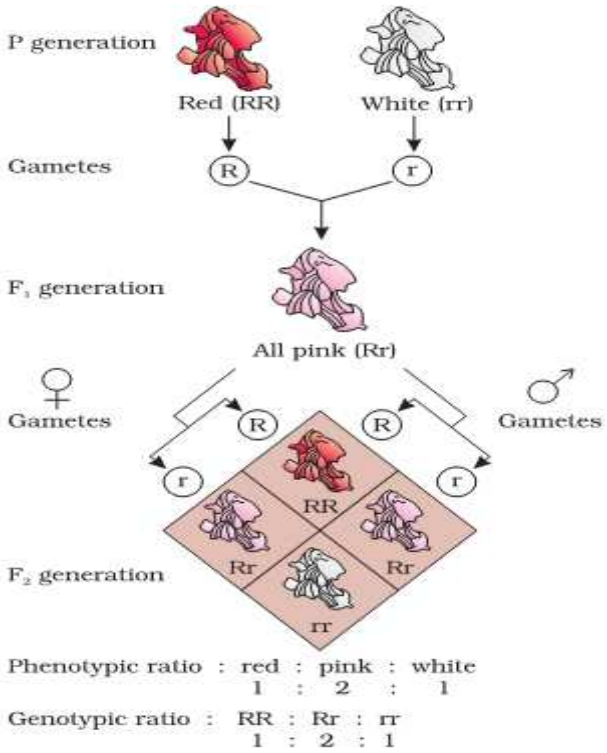
Ans9. i) Dominance :- When a cross is made between true – breeding tall pea plant & true – breeding dwarf pea plant, all the plants in F_1 generation are tall this sows that tall character is dominant over dwarf



Ans9 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 I^A & I^B ore dominant over I^0 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

Ans9. 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



CBSE TEST PAPER-03

CLASS - XII BIOLOGY (Principle of Inheritance)

1. What is mutagen? Give an example? [1]
2. What was the total number of varieties of garden pea which Mendel had taken to start his experiment? [1]
3. Name any one plant & its feature that shows the phenomena of incomplete dominance? [1]
4. Give the chromosomal constitution & related sex in each of the following :- [2]

   i) Turner syndrome

   ii) Klinefilter syndrome
5. What is pedigree Analysis? How is it useful? [2]
6. What are multiple alleles? Give an example? [2]
7. How sex is determined in human brings? [3]
8. A smooth seeded & red – flowered pea plant (SsRr) is crossed with smooth seeded & white flowered pea plant (Ssrr). Determine the phenotypic & genotypic ratio in f_1 progeny? [3]
9. A dihybrid heterozygous tall & yellow pea plant was crossed with double recessive plant. [5]

   (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?

CBSE TEST PAPER-03

CLASS - XII BIOLOGY (Principle of Inheritance)

[ANSWERS]

Ans1. The physical or chemical agents that causes mutations are called mutagen eg x-rays, CNBr etc.

Ans2. fourteen.

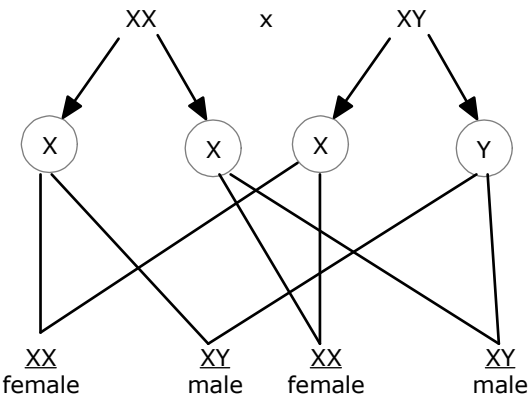
Ans3. Antirrhium majus which shows incomplete dominance in flower colour.

Ans4. 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.

Ans5. 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.

Ans6. 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 I^A I^B & I^O of a gene determines the phenotype of four blood groups.

Ans7. 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.

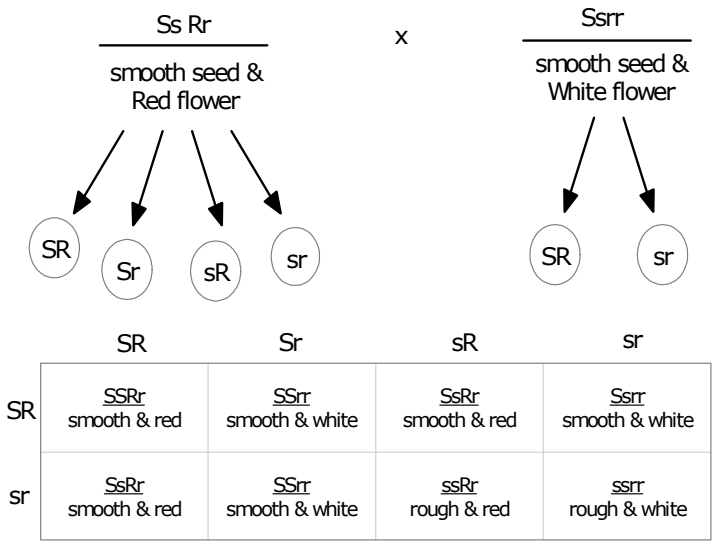
Ans8.

i) Smooth seed & red flower =3

ii) Smooth seed & white flower =3

iii) Rough seed & red flower =1

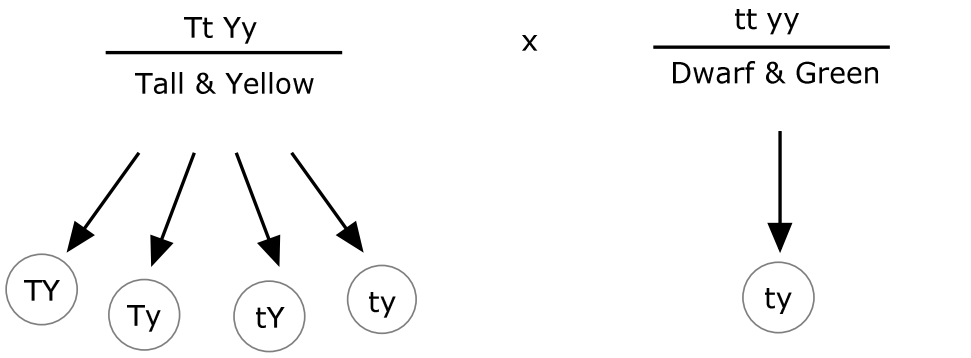
iv) Rough seed & white flower =1



	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

Ans9.i) Test cross.

Ans9.ii)



	TY	Ty	tY	ty
ty	TrYy tall & yellow	TtYy tall & green	ttYy dwarf & yellow	tt yy dwarf & green

Ratio :- 1:1:1:1

Ans9. 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 TEST PAPER-04

CLASS - XII BIOLOGY (Molecular Basis of Inheritance)

1. Name the process in which unwanted mRNA regions are removed & wanted regions are joined. [1]
2. Give the initiation codon for protein synthesis. Name the amino acid it codes for? [1]
3. In which direction, the new strand of DNA synthesised during DNA replication. [1]
4. "DNA polymerase plays a dual function during DNA replication" comment on statement? [2]
5. 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? [2]
6. Give two reasons why both the strands of DNA are not copied during DNA transcription? [2]
7. What is transformation? Describe Grifith's experiment to show transformation? What did he prove from his experiment? [3]
8. The base sequence on one strand of DNA is ATGTCTATA [3]
    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?
9. What is an operon? Describe the major steps involved in an operon? [5]

CBSE TEST PAPER-04

CLASS - XII BIOLOGY (Molecular Basis of Inheritance)

[ANSWERS]

Ans1. RNA splicing.

Ans2. Initiation codon – AUG & it code for methionine.

Ans3. 5' ⟶ 3

Ans4. DNA polymerase plays a dual function –it helps in synthesis of new strand & also helps in proof reading ie replacement of RNA strands lay DNA fragments.

Ans5. 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.

Ans6. I) If both the strands code for RNA two different RNA molecules & two different proteins would be formed hence genetic machinery would become complicated

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

Ans7. Transformation means change in genetic makeup of an individual. Fredrick Grifith conducted a series 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.

Ans8. i) TACAGATAT.

ii) UACAGAUAU

iii) Hydrogen bonds hold these base pairs together. Adenine & thymine are bounded by two hydrogen bonds & cytosine & Guanine are bonded by three hydrogen bonds.

Ans9. Operon is a group of controller & structural genes which controls the catabolism of the cell genetically eg lactose operon / lac operon.

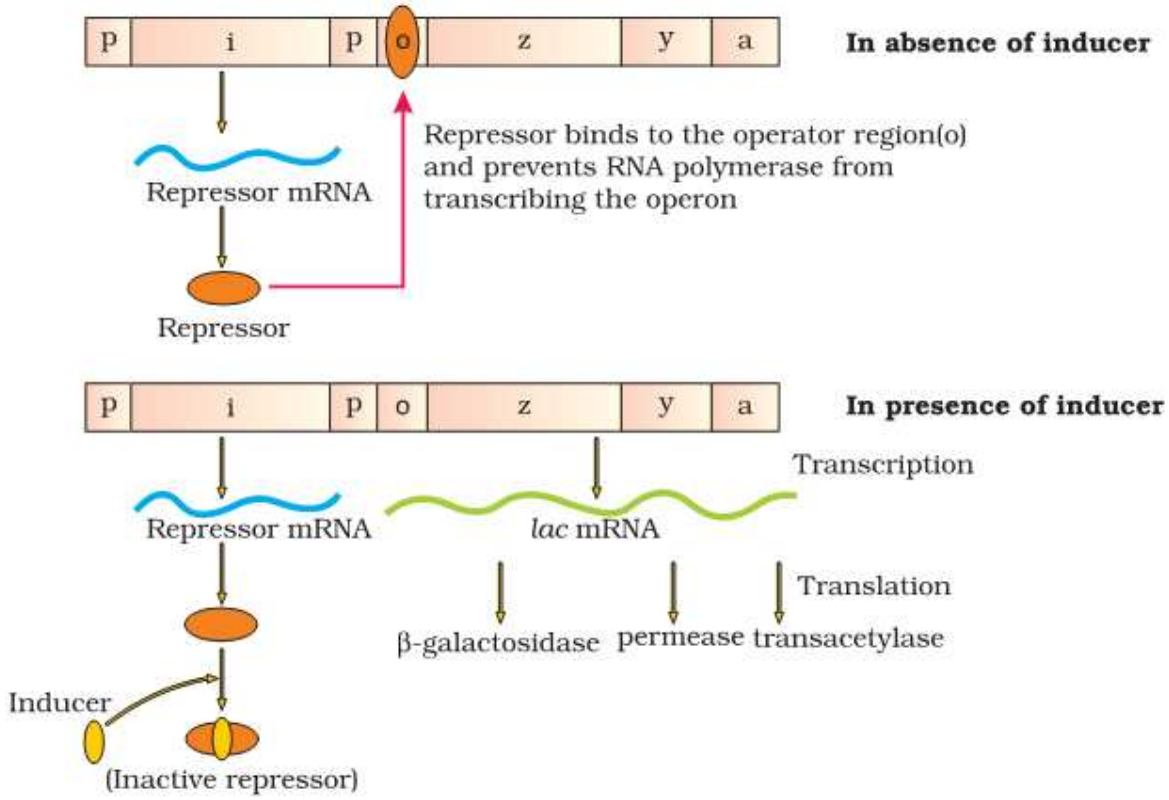
i) When inducer or lactose is absent :-

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.



CBSE TEST PAPER-05

CLASS - XII BIOLOGY (Molecular Basis of Inheritance)

1. What is the function of amino acyl tRNA synthetase. [1]

2. What is point mutation? [1]

3. Name the enzyme that joins the short pieces in the lagging strand during synthesis of DNA? [1]

4. Why is it essential that tRNA binds to both amino acids & mRNA codon during protein synthesis? [2]

5. What is peptide bond? How is it formed? [2]

6. Explain what happens in frameshift mutation? Name one disease caused by the disorder? [2]

7. 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? [3]

8. 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. [3]

9. What do you mean semi conservative nature of DNA replication. Who proved it & how? [5]

CBSE TEST PAPER-05

CLASS - XII BIOLOGY (Molecular Basis of Inheritance)

[ANSWERS]

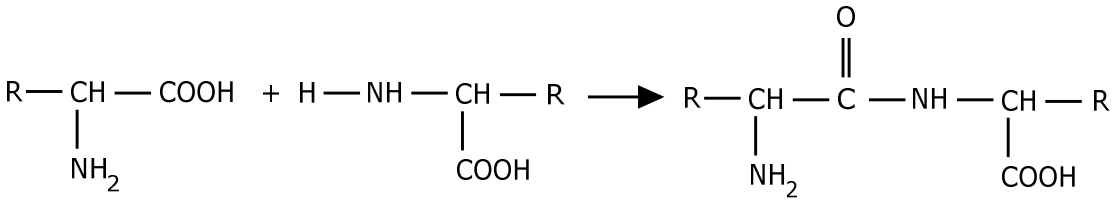
Ans 1. Amino acyl tRNA synthetase catalyses activation of amino and attachment of activated amino acids to the 3-end of specific tRNA molecule.

Ans 2. Mutation due to change in a single base pair in a DNA sequence is called point mutation.

Ans 3. Ligase.

Ans 4. 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.

Ans 5. Peptide bond is formed between carboxylic group (COOH) of first amino acid & amino group ($-NH_2$) of second amino acid. This reaction is catalysed by peptidyl transferase



Ans 6. 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.

Ans 7. This case to identify the real biological father could lee settled lay DNA – finger printing technique. In this technique :-

i) first of all, DNA of the two claimants who has to be tested is isolated.

ii) Isolated DNA is then digested with suitable restriction enzyme & digest is subjected to gel electrophoresis.

iii) The fragments of ds DNA are denatured to produce ss DNA by alkali treatment.

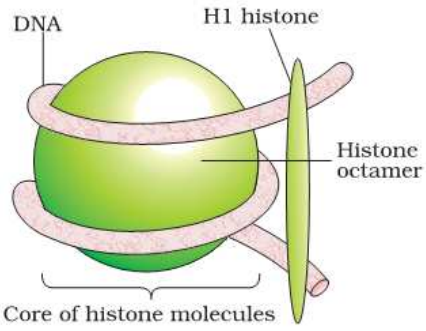
iv) The electrophoresed DNA is then transferred from get into a nitrocellulose filter paper where it is fixed.

v) A known sequence of DNA is prepared called probe – DNA & is labelled with radioactive esotope 32p & then probe is added to nitrocellulose paper.

vi) The nitrocellulose paper is photographed on X –ray film through auto radiography. The film is analysed to determine the presence of hybrid nucleic acid.

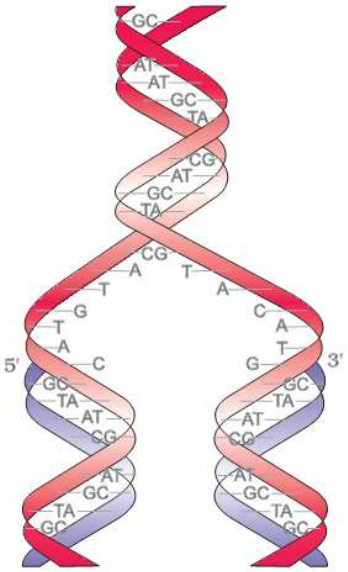
Then, the DNA fingerprints of the two claimants is compared with the DNA fingerprint of the lady & her daughter, whosoever matches with each other would be declared as biological father of her daughter.

Ans 8. In eukaryotes, the DNA is wrapped around positively charged histone octamer into a structure called nucleosome. A typical nucleosome consists of 200bp of DNA helix. The nucleosomes are the repeating units that form chromatin fibres. These chromatin fibres condense at metaphase stage of cell division to form chromosomes. The packaging of chromatin at higher level requires additional set of proteins called non-histone chromosomal proteins thus in nucleus, certain regions of the chromatin are loosely packed & they Stain lighter than the other region, these are called euchromatin. The other region are lightly packed & they stain darker & are called heterochromatin



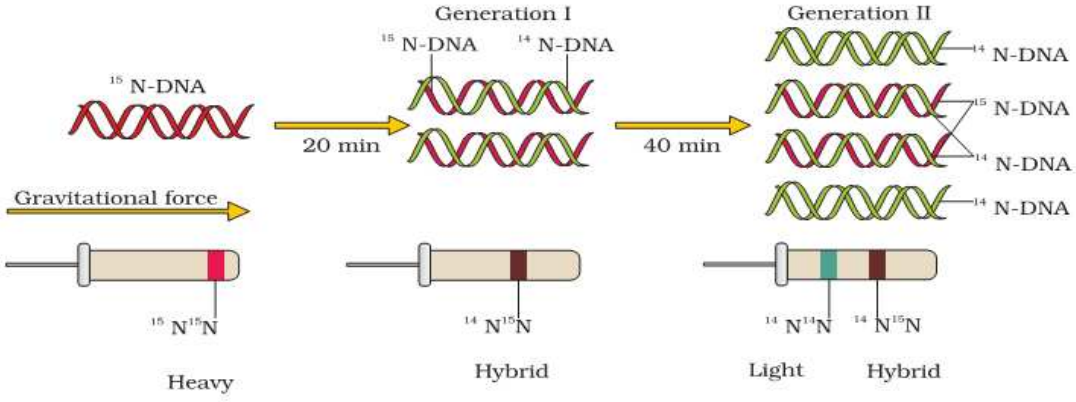
Ans 9. Semiconservative nature of DNA replication suggested that during replication two strands would separate & each acts as a template for the synthesis of new complementary strand so, that after complete replication, each DNA molecule

would have one parental & one newly synthesized strand thus, half the information is conserved over generation.



Mathew Messselson & Franklin stahl have performed an experiment using Escherichia coli to prove that DNA replication is Semiconservative.

They grew E.coli in a medium containing $^{15}NH_4Cl$ until 15N was incorporated in the two strands of newly synthesised DNA this heavy DNA can be separated from normal DNA lay centrifugation in CsCl density gradient. Then they transferred the cells into a medium with normal $^{14}NH_4Cl$ & took samples at various time intervals & extracted DNA & centrifuged then to measure their densities. The DNA extracted from the cells after one generation to transfer from ^{15}N medium to ^{14}N medium had an intermediate / hybrid density. The DNA extracted after two generations (i-e after 40 min) consisted of equal amount of "light" DNA & "Hybrid" DNA.



(Separation of DNA by Centrifugation)

CBSE TEST PAPER-06

CLASS - XII BIOLOGY (Molecular Basis of Inheritance)

1. Name the enzyme which helps in formation of peptide bond? [1]

2. Who experimentally prove that DNA replication is semi conservative. [1]

3. What is a codon? [1]

4. What do you mean by "Central Dogma of Molecular genetics?" [2]

5. Give two reasons why both the strands are not copied during transcription? [2]

6. Why is human Genome project considered as mega project? [2]

7. A tRNA is charged with amino acid methionine. [3]

   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?

8. Describe the continuous & discontinuous Synthesis of DNA? [3]

9. Where do transcription & translation takes place in a prokaryotic cell? [5]

   Describe the three steps involved in translation?

CBSE TEST PAPER-06

CLASS - XII BIOLOGY (Molecular Basis of Inheritance)

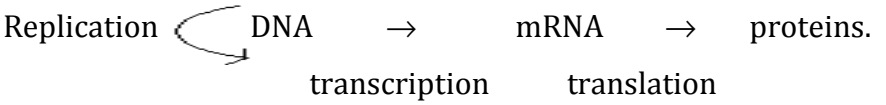
[ANSWERS]

Ans 1. Peptidyl transferase

Ans 2. Messelson & stahl.

Ans 3. Triplet sequence of bases which codes for a single amino is called a codon.

Ans 4. 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.



Ans 5.
i) If both the strands codes for RNA, two different RNA molecules & two different proteins are formed 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.

Ans 6. Human Genome project was called mega project for the following facts.

i) The human genome has approximately 3.3 x 10^9 bp, if the cost of sequencing is US $ 3per bp, the approximate cost is about US $ g billion.

ii) If the sequence obtained were to be stored in a typed form in books & if each page contained 1000 letters & each book contained 1000 page than 3300 such books would be needed to store complete in formation

iii) The enormous quantity of data expected to be generated also necessitates the use of high speed computational devices for data storage, retrieval & analysis.

Ans 7. i) P- site

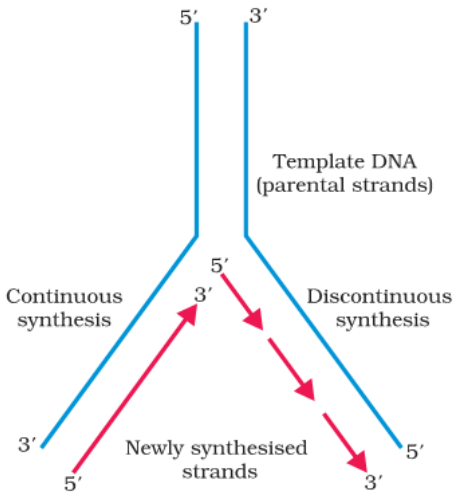
ii) UAC

iii) AUG

iv) Amino acyl tRNA Synthetase

Ans 8. Synthesis of new strand of DNA takes place lay addition of fresh nucleotides to the 3 – OH group of the last nucleotide of the primer. This synthesis takes place in 5 $5' \rightarrow 3'$ direction & enzyme that catalyses this is DNA – polymerase $\therefore$ synthesis of $5' \rightarrow 3'$ strand called leading strand is continuous.

The replication of second strand of the DNA molecule is DISCONTINOUS on $5' \rightarrow 3'$ strand called lagging strand. Primase initiates primer synthesis on $5' \rightarrow 3'$ strand near the fork. The RNA – primer thus formed provides free $3'$–*OH* for replication of single stranded region on lagging strand the new complementary strand is formed in small fragments of DNA called Okazaki fragments. It is called discontinuous because it has to be initiated several times & every time an Okazaki fragment is produced.



Ans 9. In a prokaryotic cell both transcription & translation occurs in cytoplasm. It consist of following steps :-

i) ACTIVATION OF AMINO ACIDS :- amino acids are activated in the presence of ATP lay enz aminoacyl tRNA Synthetase.

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 :-

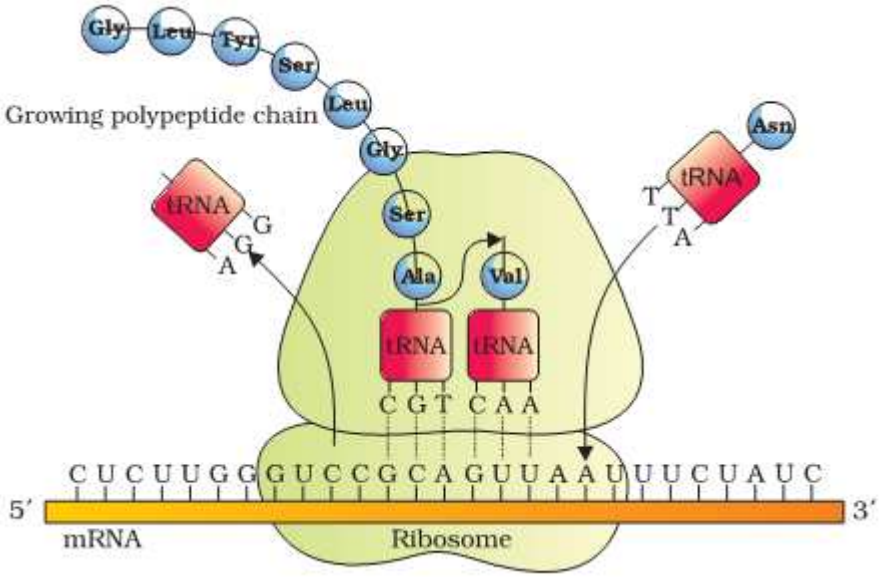
a) Second activated amino acid along its tRNA reaches the 'A' site & binds to mRNA codon next to AUG.

b) A peptide bond is formed between two amino acid by peptidyl transferase.

c) Ribosomes translocation mRNA in 3' -direction due to which free tRNA slips away & peptidyl tRNA reaches at P – site. Now third amino acid reaches at A – site & process continues.

v) 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.

vi)



CBSE TEST PAPER-07

CLASS - XII BIOLOGY (Molecular Basis of Inheritance)

1. Name the three non-sense codons? [1]

2. What is the base pairing pattern of DNA? [1]

3. Mention the dual functions of AUG? [1]

4. Why is DNA & not RNA is the genetic material in majority of organisms? [2]

5. Mention any four important characteristics of genetic code. [2]

6. Why it is that transcription & translation could be coupled in prokaryotic cell but not in eukaryotic cell? [2]

7. What are the three types of RNA & Mention their role in protein Synthesis? [3]

8. Define bacterial transformation? Who proved it experimentally & how? [3]

9. Who performed the blender experiment? What does this experiment prove? Describe the steps followed in this experiment? [5]

CBSE TEST PAPER-07

CLASS - XII BIOLOGY (Molecular Basis of Inheritance)

[ANSWERS]

Ans 1. UAA, UAG, UGA

Ans 2. In DNA, adenine always binds with thymine & cytosine always binds with Guanine.

Ans 3. AUG codes for amino acid methionine & also acts as an initiator codon.

Ans 4. The $2^{\cdot}$-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.

Ans 5. Genetic codon has following imp-features :-

i) Each codon is a triplet consisting of three bases.

ii) Each codon codes for only one amino acid i.e. – unambiguous.

iii) Some amino acids are coded lay more than one codon $\therefore$ said to be degenerative.

iv) Codons are read in a continuous manner in $5^{\cdot} \rightarrow 3^{\cdot}$ direction & have no punctuation.

Ans 6. 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 transcript contains both exon & intron & is subjected to a process called splicing where introns are removed & exons are joined in a definite order to form mRNA.

Ans 7. There are three types of RNA :

i) Messenger RNA (mRNA) :- It is a single – stranded RNA which brings the genetic information of DNA transcribed on it for protein synthesis.

ii) Transfer RNA (tRNA) :- It has a clover leaf like structure which acts as an adapter molecule which 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.

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

Ans 8. The transformation is a mode of exchange or transfer of genetic information between organism or from one organism to another.

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

i) When S-III strains of bacteria are injected into mice. It developed pneumonia & died.

ii) When R-II strains are infected into mice, they did not develop pneumonia & survive.

iii) When heat – killed S-III strains of bacteria are injected into mice, No symptoms of pneumonia develops & mice remain healthy.

iv) When a mixture of heat – killed S-III strain & lives R-II strain is injected into mice, they developed pneumonia & died.

From these results, Griffith concluded that the presence of heat – killed S-III bacteria must convert living R-II type bacteria to type S-III so as to restore them the capacity for capsule formation. This was called "BACTERIAL TRANSFORM ATION"

S strain ⟶ Inject into mice ⟶ Mice die

R strain ⟶ Inject into mice ⟶ Mice live

S strain (heat-killed) ⟶ Inject into mice ⟶ Mice live

S strain (heat-killed) + R strain (live) ⟶ Inject into mice ⟶ Mice die

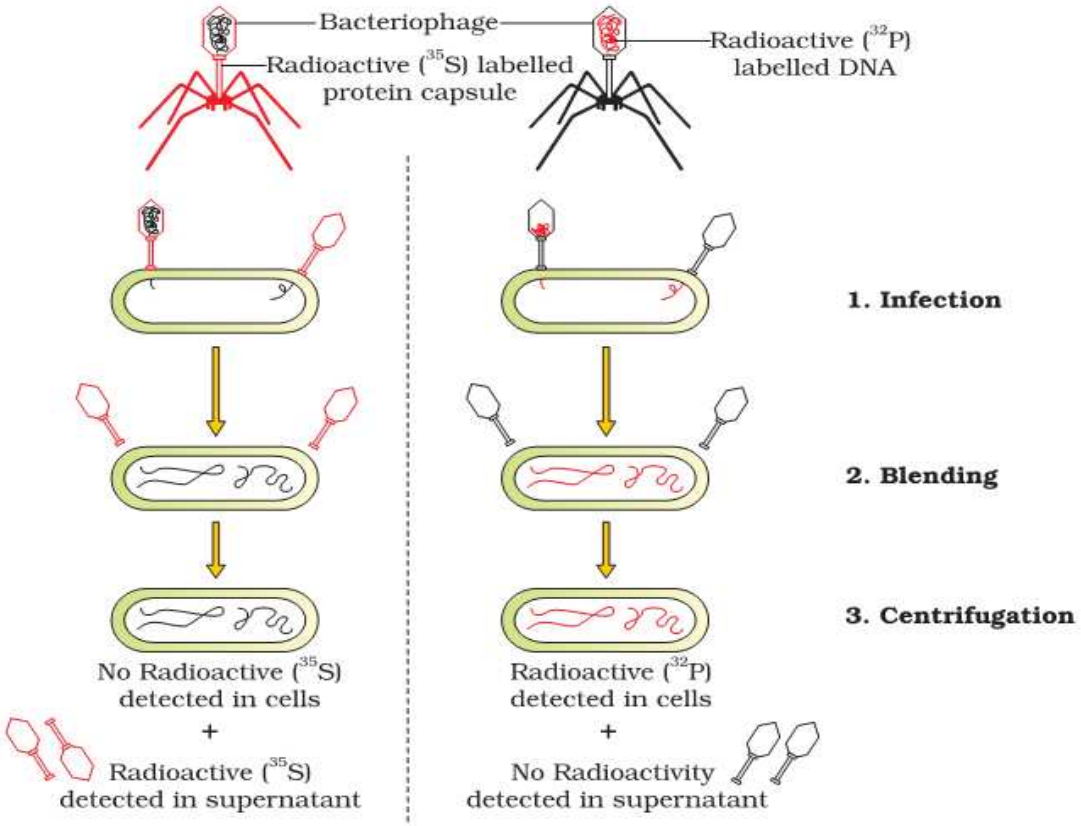
Ans 9. The proof for DNA as the genetic material came from the experiments of Harshey & chase who worked with bacteriophage.

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 were gently 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 its radioactivity was found in bacterial cells indicating that DNA has been injected into bacterial cell so, the DNA is the genetic material & not proteins



CBSE TEST PAPER-08

CLASS - XII BIOLOGY (Evolution)

1. Name any two vestigial organs found in human body? [1]

2. What is the cause of speciation according to Hugo De Vries? [1]

3. Name the phenomenon by which rapid speciation takes place? [1]

4. Define homologous organs? Give one example of organ homologous to hand of man? [2]

5. What is the role of variation in evolution? [2]

6. Describe one evidence which decisively proves that birds have evolved from reptiles? [2]

7. By taking industrial melanism as on example, explain the concept of natural selection by evolution? [3]

8. 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? [3]

9. What does Oparin – haldane hypothesis about origin of life suggests? [5]

CBSE TEST PAPER-08

CLASS - XII BIOLOGY (Evolution)

[ANSWERS]

Ans 1. Vermiform appendix, wisdom teeth.

Ans 2. Mutations.

Ans 3. Genetic Drift.

Ans 4. 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.

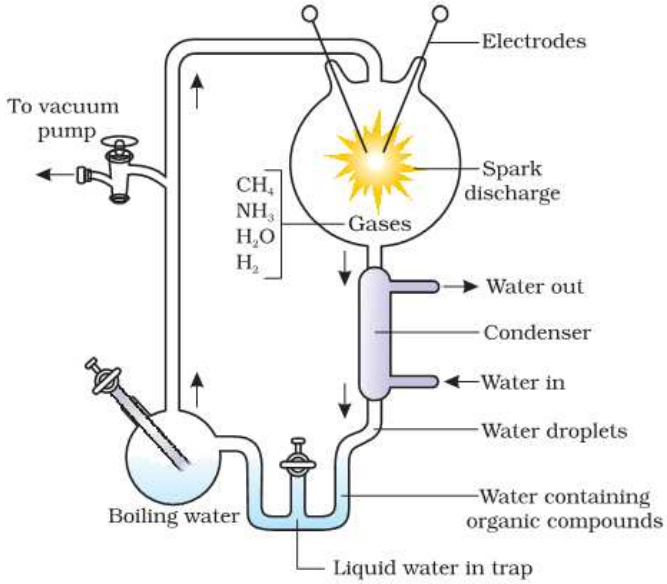
Ans 5. Variations are useful for survival of species in changed environmental situations. If a population of reproducing organisms are suited to a particular niche & if the niche is drastically altered the population could be wiped out however if some variations were to be present in few individuals, there would be some chances for them to survive.

Ans 6. 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).

Ans 7. Theory of natural selection states that due to survival of fittest, the species change readily owing 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.

Ans 8. Urey & miller tried to create in the laboratory the similar conditions which might have existed in early primitive atmosphere. A mixture of water vapours methane, ammonia & hydrogen is exposed to electric discharge in a closed chamber, this fluid thus formed is allowed to stand for several week as a result, amino acids e.g. glycerine & alanine are formed from fluid. They suggested that electric discharge produced during lightening in primitive atmosphere of earth might have resulted in formation of organic compound.



Ans 9. According to Oparin & Haldane's Biochemical origin of life; origin of life occurs in three stages

1 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.

i) Many saturated & unsaturated hydrocarbons were feasted when temp cooled to 90^0 c or below.

ii) From hydrocarbons small chain compounds of C, H, O are formed which condense to form sugar.

iii) Ketones & aldehydes condenses & polymerises to form fatty acid.

iv) Ammonia, hydrocarbon & H_2O reacted together to form amino acid.

v) Hot sea water which was rich in primary organic compound reacted to form nucleotides.

2) 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.

3) 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.

CBSE TEST PAPER-09

CLASS - XII BIOLOGY (Evolution)

1. Name the two scientists who set up a special experiment to prove Oparin's theory of origin of life? [1]

2. Name the common ancestor of apes & man? [1]

3. Which period is known as "Age of amphibians"? [1]

4. What is the study of fossils called? Mention any three points how the fossils throw light on past life? [2]

5. Why has natural selection not eliminated sickle – cell anaemia? [2]

6. Life originated from the earth's inorganic atmosphere in the post, but this no longer happens today. Give two reasons? [2]

7. What is Biogenetic law? How does comparative embryology provides evidences for evolution? [3]

8. Chemical insectides remain useful only for a limited time. Explain with reference to evolution with a suitable example. [3]

9. What does Hardy weinberg's principle states? What are the factors which affects Hardy weinberg's equilibrium? [5]

CBSE TEST PAPER-09

CLASS - XII BIOLOGY (Evolution)

[ANSWERS]

Ans 1. Urey & Miller.

Ans 2. Dryopithecus.

Ans 3. Carboniferous period.

Ans 4. 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 of particular sediment.

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

Ans 5. 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.

Ans 6. 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.

Ans 7. 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 & man resembles one another so closely that it becomes difficult to distinguish them. Mammalian embryo parses through fish – like, amphibian-like, reptiles like & bird like stages during development of an organism (ontogeny), some of the evolutionary steps (phylogeny) are repeated in different group of organism. This leads Ernst Haeckal to formulate famous theory – "RECAPITULATION THEORY / BIOGENETIC LAW. Which states that "Ontogeny recapitulates phylogeny" The sequence of embryonic development shows striking similarity e.g. appearance of gill cleft and notochord in embryonic development of all vertebrates from fish to man.

Ans 8. "Chemical insectides remain useful only for a limited time" because of the phenomena of natural selection with the course of time when chemical insecticides are excessively used to kill insects, some of the resistant varieties of the organism would have been created which are not killed lay the insect icicle such resistant varieties of the unseats are selected lay nature & they multiply after sometime population of this resistant variety increases & the chemical insecticide would lee ineffective to control these insects for example DDT is a common insecticide for mosquitoes lout is now ineffective because DDT – resistant mosquitoes have appeared & selected in nature.

Ans 9. Acc. to Hardy Weinberg's principle, allele frequency in a population are stable & is constant from generation to generation i.e. total gene pool remains constant. This is called Genetic equilibrium e.g. In a diploid organism, suppose 'p' represents frequency of allele 'A' & 'q' represents frequency of allele 'q'.

then frequency of AA = p^2

" " Aa = pq

" " aa = q^2

total alleles in F_1 Generation

$$AA + 2Aa + aa = 1$$

$$P^2 + 2pq + q^2 = 1$$

$$(p + q)^2 = 1$$

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.

CBSE TEST PAPER-10

CLASS - XII BIOLOGY (Evolution)

1. What provided energy for a biotic synthesis on primitive earth? [1]

2. Who showed that life comes from pre-existing life? [1]

3. What is meant by Gene pool? [1]

4. If you discovered a fossil bird with scales on the body & teeth in the beak. What would you conclude about its position in the animal kingdom? [2]

5. What is speciation? List any two events that lead to speciation? [2]

6. Would you consider wings of butterfly & a bat as homologous or Analogous & why? [2]

7. Define natural selection? Who else along with Charles Darwin proposed it as the mechanism of evolution? [2]

8. What are the facts that support Darwin's theory of Natural selection? [3]

9. Trace the important events or stages of human development? [3]

10. What are the three different ways in which selection may occur. [3]

CBSE TEST PAPER-10

CLASS - XII BIOLOGY (Evolution)

[ANSWERS]

Ans 1. Very high temperature due to lightening or uv – rays provided energy for a biotic synthesis.

Ans 2. Louis Pasteur

Ans 3. Gene pool refers to sum total of different kinds of genes pooled by all the members of a population.

Ans 4. 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.

Ans 5. Speciation refers to the origin of new species or the phenomena of development of new species from pre-existing one.
The two factors which lead to speciation are – Genetic drift, mutation & natural selection.

Ans 6. 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.

Ans 7. Natural selection is a process of selection lay nature in which individuals with those characteristics which enable them to survive better in natural conditions would outnumber the others who are less adapted under the same natural conditions

Alfred Wallace also proposed the same mechanism of evolution & called it "survival of fittest".

Ans 8. The following facts that supports Darwin's theory of Natural selection

i) Overproduction: - All organisms tend to multiply at high rate but it is not possible for all organisms to survive.

ii) Struggle for Existence: - Because of limitation of space & food all the offspring of the result of overproduction 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.

iii) Variations :- No two individuals of same species are exactly alike even coming out from same parent al stock.

iv) Survival of fittest :- The individuals with useful variation will survive during struggle of existence while those with less fortunate variation would perish.

Ans 9. The common ancestor of apes & man is a primate Dryopithecus that lived about 15 million years ago the human evolution is as follows :-

a) 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.

b) Homo Erectus :- They showed increase in brain size They are good hunters, ate meat domesticate animal & discover fire.

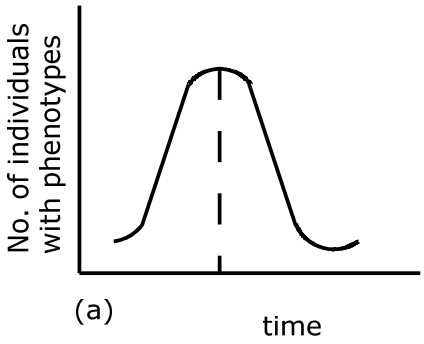
c) Netherlands man :- They were short with heavy brows retreating forehead large jaws & stooped postures They wore clothes, good hunters & tool makers.

d) Cromagnon man :- They were completely erect & 6ft tall. He used bones as tools & was a cave dweller. They are excellent tool makers & fine artists.

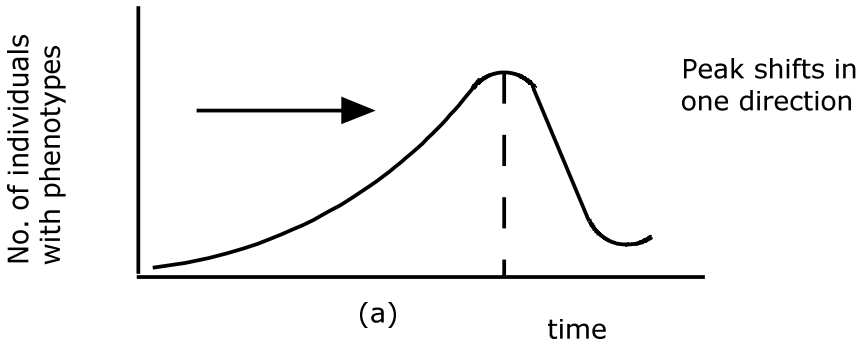
e) Homo sapiens :- They have brain capacity 1450cc. & skull much thicker. His intelligence has enabled him to adapt & control environment. He started agriculture.

Ans 10. The three different ways in which selection may occur are as below:-

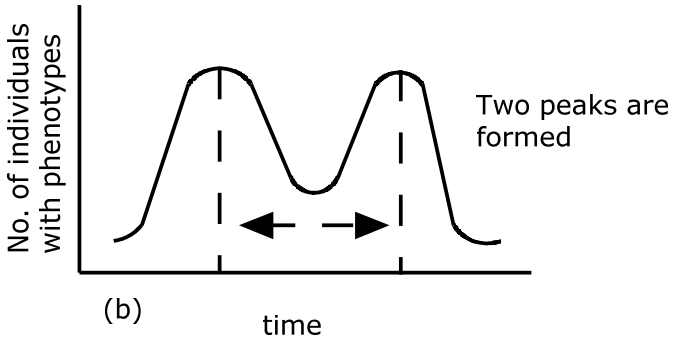
i) Stablising Selection :- Individuals with intermediate value of heritable phenotypic characteristics are favoured over other individuals.



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



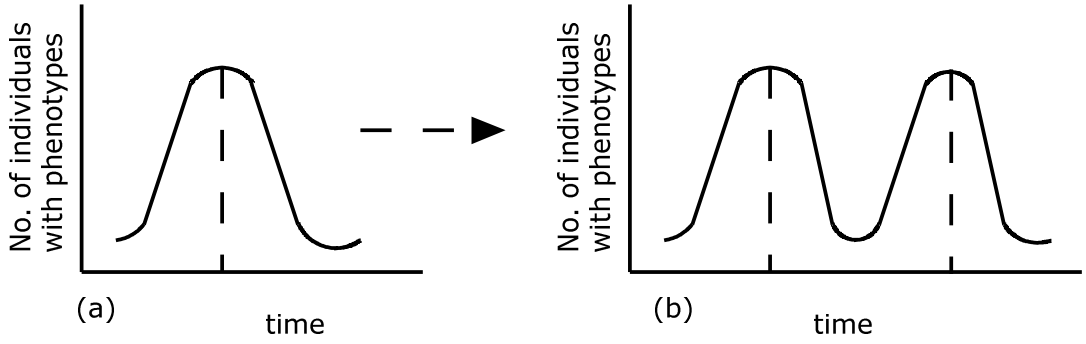
iii) Disruptive Selection :- individuals with either of both extreme of heritable phenotypic characteristics have advantage over individuals with intermediate phenotype.



CBSE TEST PAPER-11

CLASS - XII BIOLOGY (Evolution)

1. Which period is called "Age of Reptiles". [1]
2. Name the species of human beings which is most closely related to modern man. [1]
3. What is "Founder's effect"? [1]
4. A chimpanzee can hold objects by its hand & an elephant by trunk. Are these organs Analogous or homologous? [2]
5. Differentiate between convergent & divergent evolution? [2]
6. Bring out differences between De Vrie's mutations Darwinian Variations? [2]
7. State in what ways Stanley miller simulated the condition of :- [3]
   i) Primitive atmosphere on earth.
   ii) Energy source at the time of origin of life .
   iii) Formation of organic molecule of life.
8. What is Biogeography? How Darwin's finches provide biogeographical evidence in favour of evolution. [3]
9. How did louis pasteur successfully demolish the popular theory of spontaneous generation? [3]
10. Study the figures given below & answer the following question. [3]



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?

CBSE TEST PAPER-11

CLASS - XII BIOLOGY (Evolution)

[ANSWERS]

Ans 1. Jurassic period.

Ans 2. Cro-magnon.

Ans 3. 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.

Ans 4. 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.

Ans 5.

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

Ans 6. i) Mutations are large heritable changes in the characteristics of a population that arise suddenly. & cause speciation in single step while evolution for Darwin is gradual & occurs due to variations over number of generations.

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

Ans 7. 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 electric discharge using electrode.

iii) Organic molecules formed during experiment are amino acids.

Ans 8. 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 South American is lands. E.g. birds of Galapagos Island called Darwin's finches do not resemble birds of South America so he concluded that finches were derived from ancestral stock that had emigrated from mainland to island & has undergone profound changes under environmental conditions.

Ans 9. 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 a steady current of steam rushed out from s-shaped tube –causing death of all microorganisms. After this flask remains unchanged. But when neck of flask was cut-off showed thick growth of microorganisms this is presumed that are contains microorganisms which in first case could not reach the flask whereas in second case they comes in direct contact with solution.

Ans 10. 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.

CBSE TEST PAPER-01

CLASS - XII BIOLOGY (Human Health and Diseases)

1.	When is a tumour refered to as malignant?	[1]
2.	Why does an AIDS patient suffer from many infections?	[1]
3.	Name two curable sexually transmitted diseases?	[1]
4.	Differentiate between two different types of tumours?	[2]
5.	What do you mean withdrawal Symptoms? What are its characteristics?	[2]
6.	Differentiate between active & passive immunity?	[2]
7.	How does humoral immune system works when our body is infected?	[3]
8.	It was diagnosed by a specialist that the immune System of the body of a patient has been suppressed. Describe the infection & the mechanism of its proliferation in the body.	[3]
9.	Discuss the role of lymphoid organs in the immune response. Explain the different types of lymphoid organs giving two examples of each type in humans.	[5]

CBSE TEST PAPER-01

CLASS - XII BIOLOGY (Human Health and Diseases)

[ANSWERS]

Ans.1 A tumour is said to be malignant when grows rapidly, invade & damage the surrounding normal tissues.

Ans.2 Because in AIDS patient, immune system greatly weakens & cannot fight against any infection.

Ans.3 Gonorhoea & Syphillis

Ans.4

BENIGN TUMOUR	MALIGNANT TUMOUR
i) tumour remain confined to place of origin or affected organ	i) tumour invade surrounding tissue & spread throughout the body.
ii) It is harmless	ii) It is harmful
iii) rate of growth of tumour is low	iii) rate of growth of tumour is rapid
iv) causes limited damage	iv) Cause uncontrolled damage.

Ans.5 Withdrawal symptoms refers to the characteristic unpleasant symptoms by body of a drug addict if regular dose of drug is abruptly discontinued. These include anxiety, shakiness, sweating, restlessness, depression, muscular cramps etc.

Ans.6

ACTIVE IMMUNITY	PASSIVE IMMUNITY
i) when antibodies are developed by our own cells in response to antigen	i) when antibodies developed in other vertebrates in response to deliberate infection of antigen
ii) It takes time to develop immunity	ii) It is used when the immune response has to be faster
iii) It stays for longer period	iii) It stays for short period

Ans.7 Humoral immune response is one in which antibodies are developed which are capable of attacking microbes. Each B-cell has receptors on its surface that recognize a specific antigen. Initial exposure of B-cell to Antigen triggers B-cells to proliferate forming a large clone cell continuous stimulation increases the number of B-lymphocytes which differentiates into smaller antibody producing plasma cells. Each clone of plasma cells manufactures antibodies that specifically react with antigenic determinant that stimulated the initial proliferation. The antibody binds to antigen- forming an antigen-antibody complex which is later digested by phagocytic cells. Some of these plasma cells develops into memory cells which rapidly differentially into plasma cells on later exposure to same antigen.

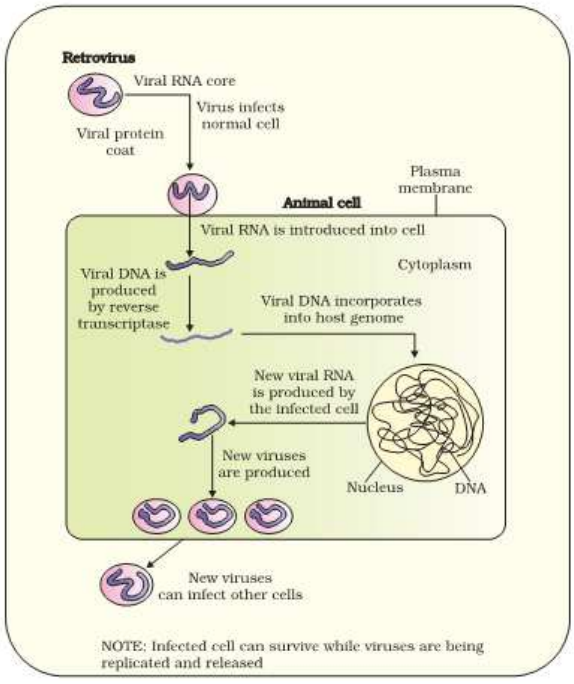
Ans.8 If the immune system of the patient is found to be suppressed, he is found to suffer from human immunodeficiency virus (HIV). The HIV virus enters into helper T- cells & replicate to produce progeny viruses. The replication of virus involves:-

i) After viral capsid enters the cell enzyme reverse transcriptase copies single stranded RNA into complementary DNA.

ii) The RNA is degraded lay ribonuclease H & the DNA strand is duplicated to form double – stranded DNA.

iii) Proviral DNA is integrated into cells DNA through a complex sequence of reactions catalysed lay Integrase enzyme.

iv) Once the virus has infected the cell, virus becomes active & large number of virus particles are liberated that can infect other cells.



Ans.9 Lymphoid organs are organs where origin or maturation & proliferation of lymphocytes occurs. These lymphoid organs are of two types:-

(1) **PRIMARY LYMPHOID ORGAN: -** where immature lymphocytes differentiate into antigen – sensitive lymphocytes. It includes :-

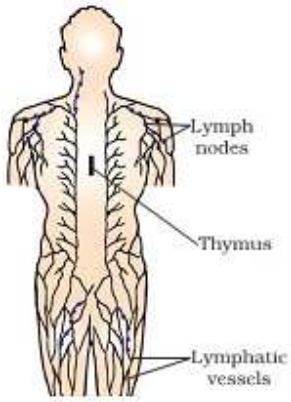
a) **BONEMARROW :–** It is the main lymphoid organ present in the thigh region where all types of blood cells including lymphocytes are formed. It provides micro – environment for the development & maturation of B – cells.

b) **THYMUS :-** It is located beneath the chest bone near heart. It provides microenvironment for the development & maturation of T – lymphocytes.

(2) **SECONDAR LYMPHOID ORGAN :-** They provide the site for interaction of lymphocytes with antigen which then proliferate to become effector cells. It includes.

a) **SPLEEN :-** It is large bean shaped organ & contains mainly lymphocytes & phagocytes. It acts as a filter of blood by trapping blood – bound micro – organism.

b) **LYMPHNODE :-** They are small – solid structure located at different points along lymphatic system. It serves to trap antigen which happens to get into lymph & tissue fluid. Antigen trapped in lymph nodes are responsible for activation of lymphocytes,



CBSE TEST PAPER-02

CLASS - XII BIOLOGY (Human Health and Diseases)

1. Name the type of cells that produce antibodies? [1]
2. Give the scientific name of causative germ of elephantiasis? [1]
3. Name the fish that help in eradication of mosquito larvae. [1]
4. Enumerate the two properties of cancer cells that distinguish them from normal cell. [2]
5. What are allergens? How do they cause inflammatory response inside human body? [2]
6. What are autoimmune diseases? Give two examples? [2]
7. What are carcinogens? What are the different types of carcinogens? Also mention the different methods of treatment of cancer? [3]
8. Describe the ill – effects of drug abuse in males & females. Also mention the preventive measures that is to be taken to reduce such effects. [3]
9. With the help of a well – labelled diagram, Describe the life cycle of malarial parasite. [5]

CBSE TEST PAPER-03

CLASS - XII BIOLOGY (Human Health and Diseases)

1. Name the test performed for the diagnosis of AIDS? [1]
2. Give an example of vaccine produced by recombinant DNA technology? [1]
3. What is the name given to the infectious stage of plasmodium? [1]
4. Name the cells of immune system that are affected by HIV. [1]
5. How does cell – mediated immune system works when our body is infected? [2]
6. Why is Second exposure to the same antigen elicits a quick & intense response? [2]
7. Draw a well – labelled diagram of antibody molecule. [2]
8. What is metastasis? [2]
9. What are the various routes by which transmission of HIV takes place? [2]
10. What is vaccination? What type of immunity is provided by vaccination? [3]
11. i) Differentiate between communicable & non – communicable diseases? [3]
    Ii) Name the body part & the host in which following events takes place in life cycle of plasmodium.
    a) fertilization
    b) Development of Gametophyte :-
    c) Release of sporozoites :-
    d) Asexual Reproduction.

CBSE TEST PAPER-03

CLASS - XII BIOLOGY (Human Health and Diseases)

[ANSWERS]

Ans 01. ELISA (enzyme – linked immuno sorbant assay) .test

Ans 02. Hepatitis – B vaccine

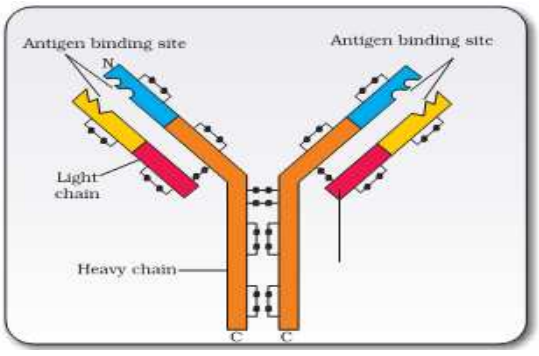
Ans 03. Sporozoites.

Ans 04. Hepper T cells or T_H cells.

Ans 05. In cell – mediated immunity, there is formation of large number of T – cells. These T – cells have specific capacity to attach to antigen & destroy them. Some activated cytotoxic T – cells (Tc) attach to cell & destroy the infected cell.

Ans 06. During first exposure to any antigen, the B-cells proliferate to form plasma cells. Some of these plasma cells develop into memory cells which stores the capacity to identify a specific antigen. These memory cells rapidly differentiate into plasma cells on later exposure to same antigen.

Ans 07.



Ans 08. Metastasis is a phenomenon in which cancer cells Spread to different Sites through the body fluids & develop secondary temours.

Ans 09. i) Sexual contact with infected person.

ii) transfusion of contaminated blood & blood products.

iii) Sharing of infected needles as in case of intravenous injection.

iv) from infected mother to her child through placenta.

Ans 10. Vaccination is a process of development of immunity with administration of vaccines in the body, here weakened pathogen are infected into the body to produce immunity against a particular pathogen. This pathogen stimulates the body to produce antibodies. The antibodies produced against these antigens would neutralize the pathogenic agent. The vaccine also generates memory B – and T – cells that recognize pathogen quickly on subsequent exposure & overwhelm the invaders with massive production of antibodies.

The type of immunity is ACTIVE IMMUNITY.

However, if a person is infected with some deadly microbe to which quick immune response is required, we need to directly injected to patient's body, This type of immunization is called PASSSIVE IMMUNISATION.

Ans 11. i) Communicable diseases are caused lay biological agents & can spread from one person to another or one place to another through air, water, physical contact etc.

Non – communicable diseases are confined to a person & do not easily spread from one person to another.

ii) (a) in the gut of female anopheles.

(b) in RBCS of Human beings.

(c) Salivary gland of female anopheles.

(d) liver cells of human beings.

CBSE TEST PAPER-04

CLASS - XII BIOLOGY (Strategies for Enhancement in Food Production)

1. Name any two semi – dwarf varieties of wheat introduced into all wheat growing places of India? [1]
2. What is Biofortification? [1]
3. Give an example where mutation breeding has been Successfully carried out for introducing disease resistance. [1]
4. What is single cell protein? What is its significance? [2]
5. Expand MOET. How is it carried out? [2]
6. What is germplasm? Why is it necessary to have gemplasm collection? [2]
7. What measures would you undertake to improve the quality & quantity of milk production? [3]
8. What is “tissue culture”. What are the steps involved in tissue culture? [3]
9. What do you mean by “Out – breeding”. What are the different methods employed for out breeding. [5]

CBSE TEST PAPER-05

CLASS - XII BIOLOGY (Strategies for Enhancement in Food Production)

1. Name two better yielding varieties of rice developed in India? [1]
2. Name the microbe that is grown for use as protein – rich food? [1]
3. Why is mutation breeding necessary for breeding for disease resistance? [1]
4. What is inbreeding depression? Why do self – pollinated crops do not show the ill-effects of inbreeding depression? [2]
5. What is interspecific hybridization. Give an example? [2]
6. What are the advantages of breeding for disease-resistance in plants? [2]
7. What are the measures that need to be taken for effective poultry farm management? [3]
8. The steps in a programme are :- [3]
   Collection of germplasm, crossbreeding the selected parents, selection superior recombinant progeny & Testing, releasing & marketing new cultivars?
   i) What is this programme related to?
   ii) Name two special qualities as the basis of selection of progeny.
   iii) What was the outcome of the programme?
   iv) What is the popular term given to this outcome? Also name the India Scientist who is credited with chalking out of this programme.
   v) Among the above – mentioned step which is the most crucial step of this programme & why?
9. What is somatic hybridization – Explain the steps involved in the production of somatic hybrids? [5]

CBSE TEST PAPER-05

CLASS - XII BIOLOGY (Strategies for Enhancement in Food Production)

[ANSWERS]

Ans 01. Jaya & Ratna

Ans 02. Methylophilus methylotropous.

Ans 03. because there is limited availability of disease – resistance genes in the crop plants & wide varieties.

Ans 04. Continued inbreeding especially close inbreeding usually reduces fertility & even productivity. This is called inbreeding depression. In self – pollinated crops, since the male & female reproductive parts are of the same flower & are compatible with each other to cause fertilisation : it does not show ill – effects of inbreeding depression.

Ans 05. It is a method of outbreeding in which male & female animal of two different species are crossed to combine the desirable features of both the parents into one eg, mule is produced by a cross between donkey & a female horse.

Ans 06. Plant breeding for disease resistance has two advantages

i) Enhance food production lay reducing losses due to diseases.

ii) Reduced dependence on use of fungicides & bacteriocides

Ans 07. i) It requires a crowd – free, rainproof, well ventilated & protected brood house.

ii) Brood house should be clean & disinfected.

iii) Good drainage system.

iv) Proper fed & clean & fresh drinking water.

v) Proper light management for optimum egg production.

vi) Poultry are more sensitive to heat so, measures should be adopted to overcome heat shock.

a) Sheds should be covered with grass or low vegetation.

b) Provide sprinklers on roof.

c) Maximum Ventilation.

vii) Disease – free & suitable breeds should be selected for breeding.

Ans 08. i) Plant breeding.

ii) Disease resistance & yield.

iii) Production of improved varieties.

iv) The popular term give to this outcome is HYBRID. Dr. S. Swamminathan is credited with chalking out of this programme.

v) Selection of superior progeny is the most crucial step of this programme because it yields plants that are superior to both parents & are then self – pollinated for several generations.

Ans 09. Somatic hybridization is the process of fusing protoplasts of somatic cells derived from two different varieties or species of a plant on a suitable nutrient culture medium under sterile condition. One example of somatic hybrid is topato produced by fusion of protoplast of tomato & potato.

Somatic hybridization involves the following steps:-

i) Isolation of protoplast from two different varieties of plants – each having a desirable character,

ii) Fusion of cytoplasm of two protoplast results in coalescence of cytoplasm. The nuclei of two protoplasts may or may not fuse together even after fusion of cytoplasm, fusion of protoplast requires a suitable agent called fusogen eg. PEG or polyethylene glycol.

iii) Under favourable conditions, hybrid protoplast synthesise new cell wall around it. Hybrid cell functions as a single cell & then undergo sustained division to form callus.

iv) The regenerated callus is transferred to a new culture plates containing suitable culture media. Here callus divide & form root & shoot after organogenesis.

CBSE TEST PAPER-02

CLASS - XII BIOLOGY (Human Health and Diseases)

[ANSWERS]

Ans.1 B – lymphocytes.

Ans.2 Wuchereria Bancrofti.

Ans.3 Gambusia

Ans.4 i) uncontrolled proliferation of cells without any differentiation
ii) Ability of these cells to invade other tissues called metastasis.

Ans.5 The substance which causes the hypersensitive reaction of the immune system is called an allergen eg. dust, pollen grains etc. These allergens are actually weak antigens. First exposure to allergen does not cause allergy but consequent exposure, allergen combines with Ig E on mast cell. That causes cells to burst & release Histamines which cause inflammatory response.

Ans.6 Immunity is based on ability to differentiate foreign organism from self cells. Sometimes immune system may go off the track & turns against self antigen and elicit immunity. Such conditions are called auto – immune diseases eg. Rheumatoid arthritis, Myasthenia gravis.

Ans.7 The things that cause cancer are called CARCINOGENS. These agents may be chemical or physical things like:-

i) Smoking
ii) Tobacco chewing
iii) Radiations eg. uv- x-ray, cosmic rays.

iv) Chemical eg. mustard gas, aflatoxin, cadmium oxide

v) Biological agents eg. retroviruses

vi) Cellular agents proto-oncogenes which when activated under certain condition may lead to oncogenic transformation of cells.

Treatment of cancer involves :-

a) SURGERY :- surgical removal of tumour

b) CHEMOTERAPY : treatment with drugs that can destroy cancer cells

c) IMMUNOTHERAPY : use of interferons, interleukin, vaccines to generate non-specific defense mechanism

d) RADIATION THERAPY :- x-ray therapy or radiotherapy use of ionizing radiations to kill cancer cells.

e) HARMONAL SUPPRESSION : providing or blocking certain hormones.

Ans.8 1) ILL – DEFECTS IN MALES :- acne, increased aggressiveness , mood swing depression reduction of size of testicles, decreased Sperm production, kidney & liver dysfunction, premature baldness.

2) ILL – EFFECTS IN FEMALES :- masculinisation, increased aggressiveness, mood swings, depression abnormal menstrual cycle, excessive hair growth on face & body & deepening of voice.

The following measures are need to be taken to prevent such problems :-

a) EDUCATION & COUNSELLING :- to face problem or stress, to accept failure as part of life & to channelize child's energy to some health promoting activities.

b) AVOID UNDUE PEER PRESSURE :- to pressurize a child to perform beyond his capabilities

c) SEEKING HELP FROM PARENTS & PEERS :- to share the feeling of anxiety & guilty.

d) SEEKING PROFESSIONAL FOR MEDICAL HELP :- help available in the form of highly qualified psychiatrist, psychologist etc.

Ans.9 Malaria is caused by plasmodium vivax. It has two hosts – female anopheles is the vector of plasmodium while the primary host is man where the parasite maintains an amoeboid stage in RBCS & later produces gametophyte.

Life cycle of plasmodium involves following steps:-

i) The sporozoites enters the human body, reach the liver through blood & multiply within the liver cells such liver cells burst & release the parasites into blood.

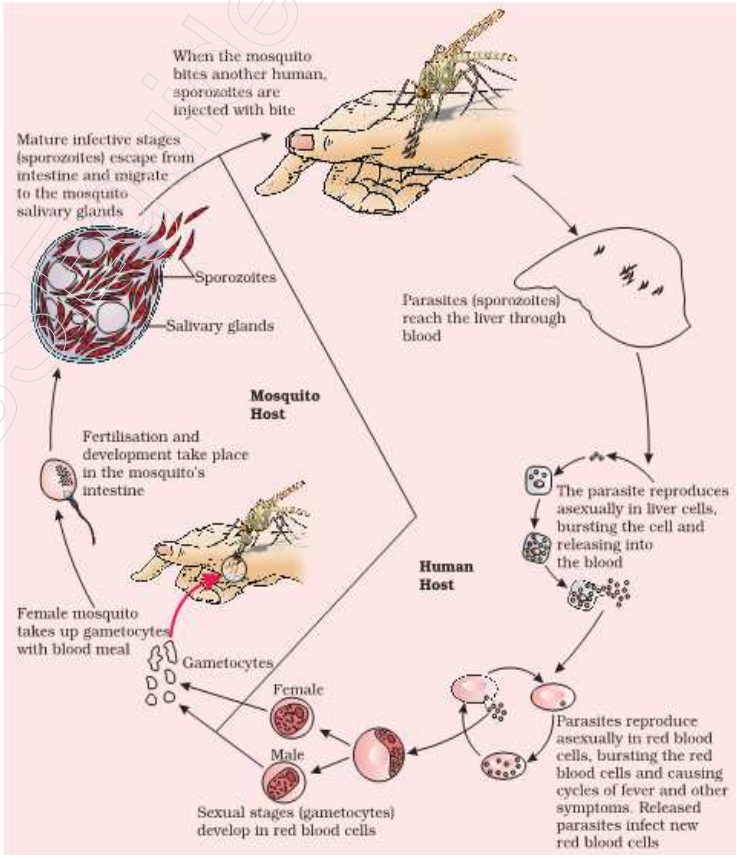
ii) They attack RBCS, multiply & cause their rupture.

The rupturing of RBCS is associated with the release of a toxin called haemozoin, which is responsible for recurring fever & the chill / shivering.

iii) Gametophytes are developed in RBCS.

iv) When a female anopheles mosquito bites an infected person, these parasites enter the mosquito's body & undergo further development. These parasites multiply within then in the stomach & develop a cyst.

v) The cyst produces sporozoites which reach salivary gland of mosquito. When such infected Anopheles sucks blood of a healthy person, it transfers. Sporozoites to repeat amoeboid stage again.



CBSE TEST PAPER-04

CLASS - XII BIOLOGY (Strategies for Enhancement in Food Production)

[ANSWERS]

Ans 01. Sonalika & Kalyan sona.

Ans 02. The breeding of crops to increase the levels of vitamins, minerals & higher proteins & healthier fats content is called biofortification.

Ans 03. varieties of mung bean have been successfully developed that are resistant to yellow mosaic virus & powdery mildew.

Ans 04. The production of edible proteins on a large scale from microorganisms for human beings & animals is called Single cell protein. It is important because :-

i) it provide protein – rich supplement in diet.

ii) It reduces pressure on agriculture for supply of desired proteins.

iii) It helps to minimise environmental pollution

Ans 05. Moet is multiple ovulation Embryo transfer. It involves following steps :-

i) a cow is administered hormones to induce follicular motivation & super ovulation.

ii) Cow is mated with a selected bull.

iii) Fertilized eggs at 8-32 celled stage are recovered & transferred to surrogate mother.

Ans 06. The sumtotal of all the alleles of the gene present in a plant & its relative is called Germplasm. Germplasm collection is very essential for effective exploitation of natural genes available in the population.

Ans 07. The quality & quantity of milk production depends on three factors :-

i) Genetic makeup. ii) Nutrition & iii) Environment

Thus, the following steps should be taken to improve management of livestock :-

a) SHEDS :- Sheds should be neat & clean, well – ventilated with pucca floor & will drained channel.

b) BALANCED DIET :- a balanced feed consists of appropriate quantities of carbohydrates, proteins, vitamins, minerals & water. The feed consists of two main components :-

i) Roughage – include fodder, hay, straw & Silage.

ii) Concentrates – broken forge crops, grams, cereals, mullets, cotton, seeds.

c) CLEAN WATER :

d) HEALTH CARE:- It requires regular inspection with proper record keeping.

Ans 08. "Tissue culture is an experimental process through which a mass of cells (callus) is produced from an explant tissue & used directly to regenerate plant It invoices following steps :-

i) Selection of an elite plant
ii) Preparation of suitable culture media
iii) Sterilisation of an explant & inoculation on culture media under controlled temp ~ 25^0 c in light
iv) Callus induction in explant.
v) Organogenesis :- a high cytokine : auxin ratio induce Shoot formation while high auxin : cytokinin ratio induce root formation.
vi) Acclamatization :- test tube rooted plantlets are first subjected to acclimatization in green house & then transferred to the field.

Ans 09. Breeding between the unrelated ale & female animals is called Outbreeding. It can be done in following ways:-

i) OUT CROSS :- The mating of animals within the same breed but do not have any common ancestor on either side of their pedigree for 4-6 generation is called an out cross. It is the best method of breeding of animals that are below average in milk production, growth rate of beef cattle etc.

ii) CROSS–BREEDING :- It is a cross between superior males of one breed & Superior females of another breed. It allows the desirable qualities of two different breeds to be combined & are used for commercial production eg . Hisardale, a new breed of sheep is developed by crossing bikaneri ewes & Marino rams.

iii) INTERSPECIFIC HYBRIDISATION :- male & female animals of two different related species are mated so, that progeny may combine desirable features of both parents eg. mule is produced by crossly donkey & a female house.

CBSE TEST PAPER-06

CLASS - XII BIOLOGY (Strategies for Enhancement in Food Production)

1. Give any two commercial products produced from Apis species? [1]

2. What is the major advantage of producing plants by micropropagation? [1]

3. What is a somaclones? [1]

4. Name any two fresh water fishes? [1]

5. Which part of the plant is best suited for making virus free plants & why? [2]

6. What is artificial insemination? What are the advantages of this technique? [2]

7. Why was hybridization carried out between species of Sugarcane in North India & that grown in south India? [2]

8. Name the variety developed & disease to which it is resistant in case of :- [2]

   i) Brassica :-

   ii) Cowpea :-

9. What is meant by the term "breed". What are the objectives of animal breeding? [2]

10 What is apiculture? What are the requirements to consider for bee–keeping? [3]

11. What are the major steps involved in Plant breeding? [3]

CBSE TEST PAPER-06

CLASS - XII BIOLOGY (Strategies for Enhancement in Food Production)

[ANSWERS]

Ans 01. Honey & bee wax

Ans 02. a large number of plants can le grown in a short period of time.

Ans 03. Somaclones are the genetically identical plants developed from any part of a plant lay micropropagation.

Ans 04. Rohu & catla.

Ans 05. Apical & intercalary buds having apical mexistem are best suited part of the plant body for making virus free plants as they are free from viral infection.

Ans 06. It is a process in which the semen collected from a superior male is injected into the reproductive tract of the selected female by the breeder.

Advantages :-

a) Semen can be used immediately or stored

b) Semen can be transported in frozen from to a distant place.

c) Semen from one selected made can be used on number of females.

Ans 07. Saccharum barberi grown in North India but had poor sugar content & Yield. Saccharum officarum had thicker Stem & high sugar content but cannot grow well in north India. The hybrid of these two varieties has desirable quality of high yield, thick stem, high sugar & ability to grow in North India.

Ans 08. i) Pusa swarnim variety developed against white rust.

ii) Pusa komal variety developed against Bacterial blight.

Ans 09. The group of animal having similar ancestral characters size, general appearance etc – are called breed.

Objectives of Animal Breeding :-

a) Increase the yield of animals.
b) Improvement in the desirable qualities of the produce.

Ans 10. The culturing of honey bees for the production of honey or beewax is called Apiculture.

Bee – keeping can be practised in any area where there is sufficient bee pastures of some wild shrubs, fruits orchards & cultivated crops. The following points are important for successful bee – keeping :-

a) Knowledge of nature & habits of bee.
b) Selection of suitable location of keeping beehives.
c) Catching & hiving of swarms.
d) Management of beehives during different seasons.
e) Handling & collection of honey & beewax.

Ans 11. The major steps involved in plant breeding are :-

i) Collection of varieties :- collection & preservation of all the different wild varieties, species & relatives of the cultivates species.
ii) Evaluation & Selection of Parents :- Germplasm collected is evaluated to identify plants with desirable character. The selected plants are multiplied & used.
iii) Hybridisation of Selected Parents :- The selected parents are hybridized so that the traits in them can be combined in the hybrid progeny.
iv) Selection & Testing of Superior Recombinants :- Individuals with desired combination of characters have to be selected from among the progeny. Such hybrids are superior to both the parents.
v) Testing, Release & commercialization of New cultivars :-

Evaluation is done by growing these plants in the research field & recording their performance under ideal conditions of irrigation, fertilizers & other crop practices. The selected plants are then tested in the farmer's field for at least three growing seasons. The material thus selected is certified & released as a variety.

CBSE TEST PAPER-07

CLASS - XII BIOLOGY (Microbes in Human Welfare)

1.	What is the medical use of cyclosporin A.	[1]
2.	Name the pests that lady bird & dragon flies help to get rid off respectively?	[1]
3.	Give an example to prove that microbes release gases during metabolism?	[1]
4.	What are interferons?	[1]
5.	Name the enzyme which is used as clot buster" to remove blood clot from blood vessels of patients.	[1]
6.	Name the first antibiotic manufactured & also name its source microorganism.	[1]
7.	What are statins? Where are they produced from? How are they useful to man?	[2]
8.	What is VAM? How does it act as biofertiliser?	[2]
9.	How does small amount of curd added to fest milk convert it into curd?	[2]
10.	Why bottled fruit juices are appear clearer than home made ones?	[2]
11.	Describe the procedure involved in Sewage treatment?	[3]
12.	What is Biogas? How is it produced & Name the microbes invaded in Biogas production.	[3]

CBSE TEST PAPER-07

CLASS - XII BIOLOGY (Microbes in Human Welfare)

[ANSWERS]

Ans 01. Cyclosporin A is used as an immunosuppressive drug during organ transplantation.

Ans 02. Lady bird beetle is useful to get rid off aphids & dragon – flies control mosquitoes.

Ans 03. The best example of microbes release gases during metabolism are the puffed dough & bread.

Ans 04. Proteins released by cells in response to viral infection which they help to combat are called interferons.

Ans 05. Streptokinase.

Ans 06. Penicilin obtained from penicillium notatum.

Ans 07. Statin is produced by fungus Monascus purpureus. It is used for lowering the levels of blood cholesterol, as it acts as a competitive inhibitor of the enzyme involved in cholesterol synthesis.

Ans 08. VAM is Vesicular Arbuscular Mycorrhiza. It is the symbiotic association of fungi mycorrhiza & root. This fungi takes the phosphrus from soil & transports it to root along the hyphae. After disintegration of wall phosphorus is released into root system & is utilised by plants.

Ans 09. Small amount of curd added to fresh milk contains lactic acid bacteria (LAB). Which converts lactose sugar of milk into lactic acid which acidifies the fermenting media & thus forms the curd.

Ans 10. Because bottled fruit juices appear clearer than home – made juices because they contain enzymes eg. protease or pectinase which help to remove the particles & clear the fruit juice during bottling.

Ans 11. For treatment of sewage waste, following procedure are followed :-

i) PRIMARY TREATMENT :- It is the physical separation of suspended solids in settling tanks to lower BOD. To remove solid fraction the raw Sewage is piped into huge open tanks where they are Subjected to anaerobic digestion.

ii) SECONDARY TREATMENT :- Secondary treatment relies aerobic or anaerobic microbial activity. The methods employed in secondary treatment:-

a) filtration by sand filters

b) Aeration process

c) Use of oxidation ponds.

The sludge with accumulates after secondary treatment is disposed off after drying & efferent is allowed for tertiary treatment

iii) TERTIARY TREATMENT :- It includes chemical treatment to remove inorganic compounds & Pathogenic microorganism. Chlorthationis the usually employed method of disinfection.

Ans 12. The gas produced by anaerobic fermentation of waste biomass is called BIOGAS. It consists of methane, CO_2 hydrogen, nitrogen, Oxygen, H_2S etc. The microbes which are commonly used for Biogas production-

i) hydrolytic bacteria eg. cellulomonas, chlostridium

ii) H_2 producing bacteria eg. Syntrophomonas wolfei

iii) Methanogenic bacteria eg. Methanobacterium omelianskii

The Biogas plant consists of concrete tank is fed. A floating cover is placed over slurry, which keeps on rising as the gas is produced in the tank due to microbial activity. The Biogas plant has an outlet which is connected to a pipe to supply biogas to nearby houses. During biogas production, microbes convert the organic fraction of biodegradable organic solid waste & refuse into energy in the form of biogas & humus.

$CO + H_2O \rightarrow CO_2 + H_2$

$CO_2 + H_2 \rightarrow CH_4\ H_2O$

$CH_3OH \rightarrow CH_4 + CO_2 + H_2O$

CBSE TEST PAPER-08

CLASS - XII BIOLOGY (Microbes in Human Welfare)

1.	Name any two fungus which are used in production of antibiotics?	[1]
2.	Expand LAB?	[1]
3.	Name any two free – living nitrogen fixing bacteria.	[1]
4.	Name the organism used in the dough for making bread.	[1]
5.	Name the fungus used as a biocontrol of plant diseases.	[1]
6.	Name any two gases produced during secondary treatment of Sewage?	[1]
7.	A farmer adds Azotobacter to the soil before sowing maize. How does it increase the yield of maize?	[2]
8.	Mention the dual functions of LAB that are useful to man?	[2]
9.	What are methanogens? Give an example.	[2]
10.	What is the key difference between primary & secondary sewage treatment.	[2]
11.	Microbes can be used to decrease the use of chemical fertilizers & pesticides. Explain how can this be accomplished?	[3]
12.	How do Biofertilisers enrich the fertility of soil? How does cyanobacteria acts as biofertiliser?	[3]

CBSE TEST PAPER-08

CLASS - XII BIOLOGY (Microbes in Human Welfare)

[ANSWERS]

Ans 01. Penicillium notatum, cephalosporium acremonium.

Ans 02. Lactic acid Bacteria

Ans 03. Azotobacter, Azospirillum

Ans 04. Saccharomyces cerevisiae.

Ans 05. Trichoderma.

Ans 06. Methane, Hydrogen sulphide & carbon dioxide.

Ans 07. Farmer added Azotobacter to the soil before sowing because Azotobacter is a free-living nitrogen- fixing bacteria. They fix atmospheric nitrogen & enrich soil nutrients.

Ans 08. i) LAB produces acids that coagulate & partially digest milk protein.
ii) LAB also increases nutritional quality of curd by increasing the content of Vitamin B_{12}.

Ans 09. Certain bacteria which grow anaerobically on cellulosic material & produce large amount of methane along with CO_2 & H_2 are called Methanogens eg. Methanobactaium.

Ans 10. Primary treatment is the physical separation of suspended solids in settling tanks whereas secondary treatment involves microbial activity.

Ans 11. In modern society, the problems of plant diseases & pests are been tackled lay use of chemicals but these chemicals are toxic & extremely harmful to human beings & environment. Thus in agriculture, there is a method of controlling pests that relies on natural predation rather than chemicals eg.

In order to control butterfly, caterpillar etc, a bacteria called Bacillus thuringiensis (Bt) are available as dried spores in sachet which are mixed with water & Sprayed onto vulnerable plants eg – brassica etc where these are eaten lay insect larvae. In the gut of larvae, the toxin is released & larvae get killed. The bacterial disease will kill the caterpillar but leave other insects unharmed.

Ans 12. The Biological routes of improving soil fertility for optimum crop production are operated by micro – organism & they are hence known as "BIOFERTILIZERS. These microorganism increase crop productivity by either of the following methods

i) By fixing atmospheric nitrogen
ii) By solublising insoluble fertilizers
iii) By stimulating plant growth.
iv) By phosphorus uptake.
v) By bring about decomposition of plant residues.

Cyanobacteria eg. Anabaena which is found in the leaf cavity of water fern Azolla, fixes nitrogen from atmosphere & excretes nitrogenous compound into leaf cavity.

CBSE TEST PAPER-01

CLASS - XII BIOLOGY (Biotechnology: Principle & Process)

1. Name the substance used as a medium in gel electrophoresis. [1]

2. What is Bioconversion? [1]

3. Name the bacterium that yields thermostable DNA polymerase. [1]

4. Write any two properties of restriction endonuclease enzymes? [2]

5. What are 'Selectable marker'? What is their use in genetic engineering? [2]

6. How can the desired product formed after genetic engineering be produced on a commercial scale? [2]

7. Mention the important properties which a good vector must possess? [3]

8. Describe any three vectors less method of introducing the rDNA into a competent host cell? [3]

9. Describe the various steps involved in Recombinant DNA technology with the help of a well labeled. Diagram? [5]

CBSE TEST PAPER-01

CLASS - XII BIOLOGY (Biotechnology: Principle & Process)

[ANSWERS]

Ans.1 Agarose

Ans.2 Bioconversion refers to the process by which raw material are converted to specific product by microbial, plant or animal cell.

Ans.3 Thermus aquaticus.

Ans.4 (i) Each Restriction endonuclease functions by inspecting the length of DNA sequence & bind to DNA at the recognition Sequence.

(ii) It cuts the two strands of DNA at specific point in their sugar – phosphate backbone.

Ans.5 A selectable marker is a gene which helps in selecting those host cells which contains the vector & eliminating the non–transformant eg – gene encoding resistance to antibiotics are useful Selectable markers as they allow Selective growth of transformants only.

Ans.6 The product obtained from genetic engineering is subjected to a series of processes collectively called downstream processing before it made into final processes involved in downstream processing are :- Separation & purification.

Ans.7 The important properties which a good vector must possess are :-

i. Size :- The vector must have small size so that it is easier to purify & isolate.

ii. Origin of replication :- This is a sequence of base pairs where replication starts. Any piece of DNA linked to this sequence can be made to replicate within its host cell & thus, controls the copy number of linked DNA.

iii. Selectable Marker :- A marker is a gene which helps in selecting those host cells which contain the vector & eliminating the non – transformants Common Selectable marker include gene encoding resistance to antibiotics.

iv. Cloning Sites :- The vector Should have a few or at least one unique recognition site to link the foreign / alien DNA. Presence of a particular recognition site enables the particular restriction enzyme to cut the vector.

Ans.8 i) Transformation :- In order to force bacteria to take up the plasmid, the bacterial cell must first be made competent to take up DNA. This is done by treating them with specific concentration of divalent cation eg. Ca^{2+} which increases the efficiency with which DNA enters the bacterium through pores in its cell wall Recombinant DNA can then be forced into such cells by incubating the cells with recombinant DNA on ice, followed by placing them at 42^0 C & then putting them back into ice. This enables the bacteria to take up the recombinant DNA.

ii) Microinjection :- recombinant DNA is directly injected into the nucleus of an animal cell using a micro – needle of tip with diameter (~ 4mm)

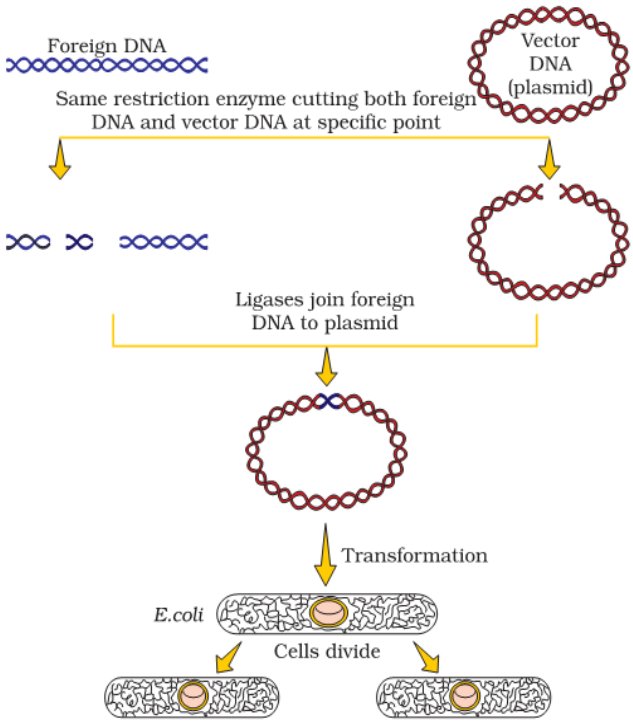
iii) Biolistics / Gene gun :- cells are bombarded with high velocity micro – particles of gold or tungsten coated with DNA.

Ans.9 i) Identification of DNA with desirable Genes:- Other molecules in the target cell can be removed by appropriate treatment & purified DNA ultimately precipitates out after addition of chilled ethanol.

ii) Cutting the DNA at specific location :- After having cut the source DNA as well as vector DNA with Specific restriction enzyme, the cut out "gene of interest" from the source DNA & the cut vector with space are mixed & ligase is added.

iii) Insertion of Recombinant DNA into host cell :- Recipient cells after making them competent to receive takes up DNA in its surrounding. Recombinant DNA is introduced into suitable host cell by vector – based or vector – less method.

iv) Selection & Screening :- If a recombinant DNA bearing gene for resistance to an antibiotic is transferred into E-coli the host – cell become transformed into ampicillin – resistant cells. Due to this amp gene one is able to select a transformed cell in the presence of ampicillin. This amp ^{r} gene is called selectable marker.



v) Obtaining the foreign Gene product :- After having cloned the gene of interest & having optimized the conditions to induce expression of the target protein, one has to consider producing it on large scale.

CBSE TEST PAPER-02

CLASS - XII BIOLOGY (Biotechnology : Principle & Process)

1. Which enzymes are known as "molecular Scissors"? [1]

2. Why does DNA moves towards anode in gel electrophoresis. [1]

3. Name the commonly used vector for trans formation in plant cell? [1]

4. What is "Insertional Inactivation"? [2]

5. What are the two basic techniques involved in modern Biotechnology? [2]

6. Represent diagrammatically the E. coli. Cloning vector β PBR 322. [2]

7. Why is Agrobacterium mediated genetic transformation described as Natural Genetic engineering in plants? [3]

8. Mention the important tools required for genetic engineering technology? [3]

9. Expand PCR? Describe the different Steps involved in this technique? [5]

CBSE TEST PAPER-02

CLASS - XII BIOLOGY (Biotechnology: Principle & Process)

[ANSWERS]

Ans1. Restriction Endonuclease.

Ans2. Because of presence of phosphate group, DNA is negatively charged & ∴ moves towards anode.

Ans3. Agrobacterium tumefacien.

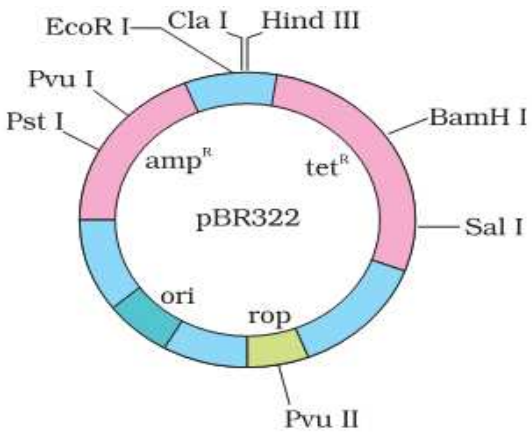
Ans4. If a recombinant DNA is inserted within the coding Sequence of enzyme B–galactosidase. This results into inactivation of enzyme which is referred to as "Insertional Inactivation". The presence of chromogenic Substrate gives blue–coloured colonies if the plasmid in bacteria does not have an insert presence of insert results into insertional inactivation & the colonies do not produce any color.

Ans5. The two basic techniques involved in modern Biotechnology are:-

a) Genetic Engineering is the technique of altering the nature of genetic material or introduction of it into another host organism to change its phenotype.

b) Techniques to facilitate the growth & multiplication of only the desired microbes or cells in large number under sterile conditions for manufacture

Ans6.



Ans7. Agrobacterium tumefacien, a natural pathogen of Several dicot plants is able to deliver a piece of DNA known as "t – DNA" to transform normal plant cell into a tumor & direct gene transfer transform tumor cells to produce chemicals required by pathogen . The tumor inducing (Ti) plasmid of Agrobacterium tumefacien has now been modified into a cloning vector which is no more pathogenic to plant but is still able to use the mechanism to deliver genes of our interest into a variety of plants

Since Agrobacterium tumefacien has the natural ability to donate a part of its DNA to the plant during infection. This property of Agrobacterium is exploited and a gene of interest is ligated into T-DNA so that it automatically gets transformed into plant cell thus, Agrobacterium tumefacien is known as "Natural Genetic Engineer" of plants.

Ans8. The process of genetic engineering is accomplished only when we have following key tools :-

a) Restriction enzymes:- Restriction enzymes are a group of endonucleases which cut the DNA at Specific position anywhere in its length. Each restriction endonuclease functions by inspecting the length of DNA & binds to DNA at the recognition Sequence.

b) Cloning Vector:- The DNA molecule which carry the desired DNA Segment of an organism & transfer it to cell or DNA of another organism is called cloning vector.

c) Desired foreign DNA:- The segment of DNA containing genes having desired characters & which are being transferred into genome of another cell with the help of vector is called foreign DNA.

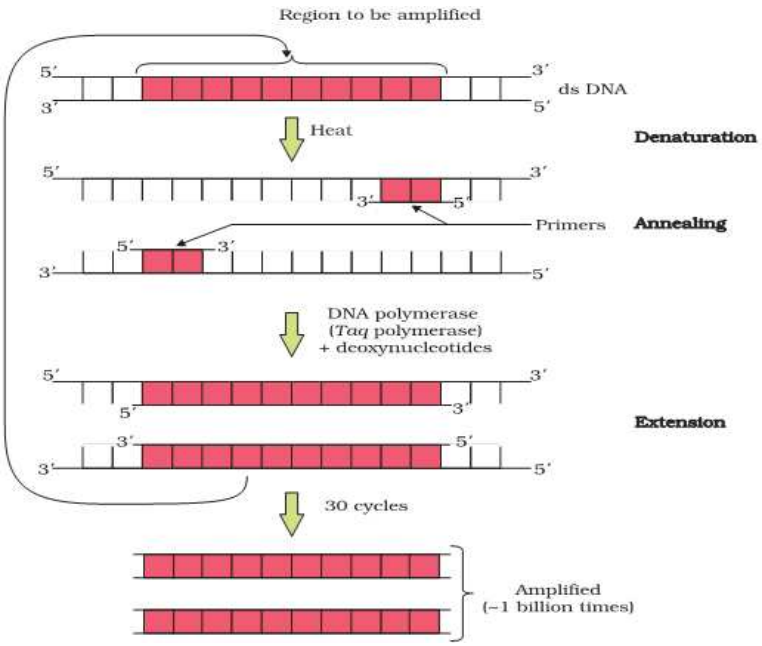
Ans9. PCR stands for polymerase chain reaction. It is a technique for amplification of gene of interest or to obtain multiple copies of DNA of interest. The PCR requires primers, taq polymerase, target sequence, DNA sample & deoxyribonucleotides.

PCR includes number of cycles for amplifying DNA of interest invitro. Each cycle has three steps :-

a) DENATURATION:- The first step is denaturation of SNA sample in a reaction mixture to 94^0 c. During this step, DNA strand gets separated.

b) RENATURATION / ANNEALING:- The temperature is allowed to cool down to 50^0c to allow two oligo-nucleotide primers to anneal to complementary sequence in DNA molecule.

c) EXTENSION:- The temperature is raised to 75^0c. At this temperature, taq – polymerase initiates DNA Synthesis at 3-OH end of primer.



CBSE TEST PAPER-03

CLASS - XII BIOLOGY (Biotechnology: Principle & Process)

1. Name the technique used for amplification of DNA? [1]

2. Name the enzyme responsible for removal of 5 – phosphate group from nucleic acid? [1]

3. Who isolated Restriction enzymes for the first time? [1]

4. Why do eukaryotic cells do not contain restriction enzymes? [1]

5. Differentiate between plasmid DNA and chromosomal DNA? [2]

6. What is the role of enzyme "Ligase" in genetic Engineering? [2]

7. Name the components a bioreactor must possess to achieve the desired product? [2]

8. The following proteins of given molecular weight are Subjected to Get electrophoresis. Write the order of Sequence in which these proteins are isolated in a gel? [2]

S.no.	Proteins	Mol.wt
1.	Albumin	23,000
2.	Keratin	48,000
3.	Myosin	1,25,000
4.	Haemoglobin	84,000
5.	Ribozyme	62,000
6.	Insulin	1,14,000

9. How is gene Z used as a marker? [2]

10. What is Bioreactor? What are the advantages of Stirred tank Bioreactor over Shake flask. Show diagrammatically a simple Stirred tank Bioreactor? [2]

11. What are Restriction enzyme? Why do bacteria have these restriction enzymes. Show diagrammatically a restriction enzyme its recognition & the product it produces? [5]

CBSE TEST PAPER-03

CLASS - XII BIOLOGY (Biotechnology: Principle & Process)

[ANSWERS]

Ans. 01 Polymerase Chain Reaction.

Ans. 02 Alkaline Phosphates.

Ans. 03 Warner Arber & Hamilton Smith.

Ans. 04 Because in eukaryotic cell, DNA is heavily methylated.

Ans. 05 Plasmid DNA is extranuclear DNA, found in protoplasmic whereas chromosomal DNA is the nuclear or genetic DNA which is found within the nucleus.

Ans. 06 Enzyme "Ligase" acts as molecular Suture which helps in joining two pieces of DNA. The Joining process requires ATP as it derive energy to construct phosphodiester bond between cohesive ends.

Ans. 07 A bioreactor should have the following component

i) An agitator system.
ii) A foam control system.
iii) PH control system.
iv) Oxygen delivery system.
v) Temperature control system.
vi) Sampling port.

Ans. 08 The sequence of proteins obtained from top to bottom in a gel:-
Myosin > Insulin > Haemoglobin > Ribozyme > Keratin > Albumin.

Ans. 09 Lac Z gene codes for enzyme β- galactosidase, if a recombinant DNA is inserted within the coding sequence of an enzyme β-galactosidase. This results into inactivation of enzyme. The bacterial colonies whose plasmid does not have an insert produce blue colour but those with an insert do not produce any colour.

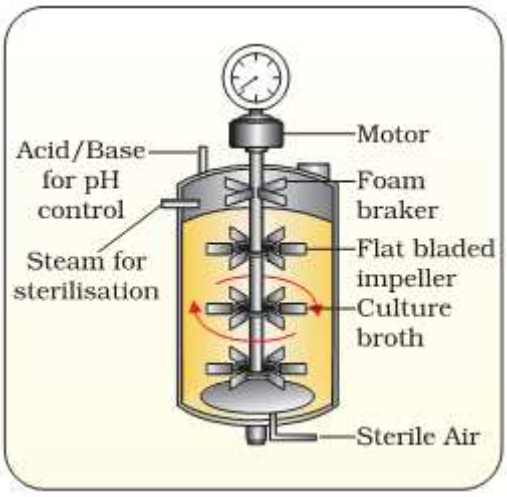
Ans. 10 Bioreactors are large vessels in which raw materials are biologically converted into specific proteins using microbial, plant, animal or human cells. The advantages of Bioreactor over shake flask are :-

a) It provides optimal conditions for achieving desired product by providing optimum growth conditions eg. temp, pH etc.

b) Small volume of cultures can be withdrawn periodically from bioreactor to test the sample.

c) It has an agitation system, temp control system, from control system & pH control system

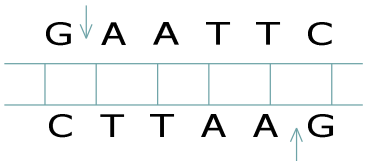
d)



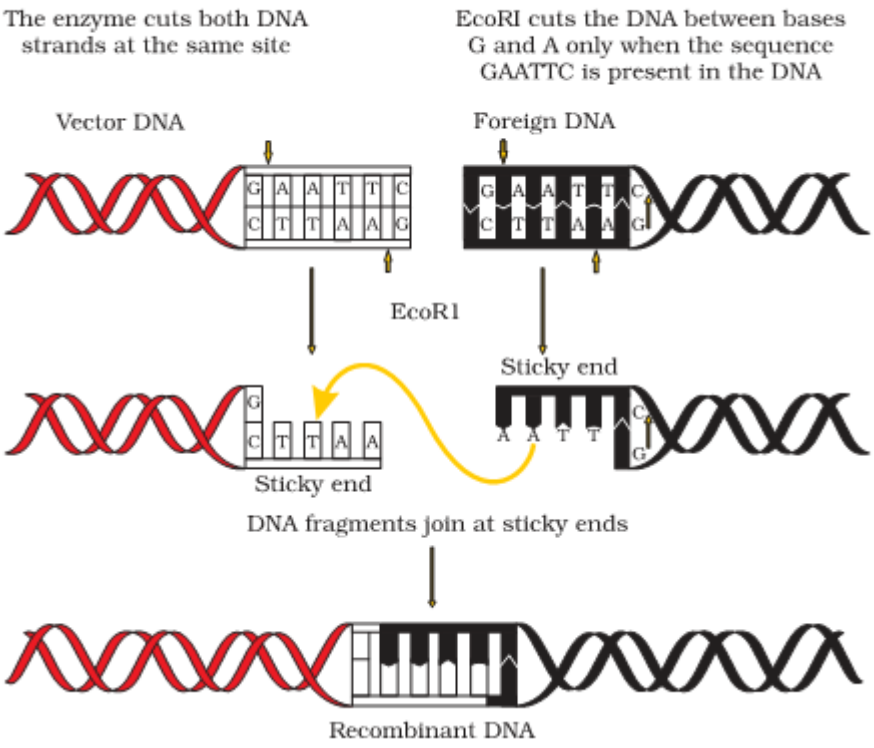
Ans. 11 Restriction enzymes are endonucleases which recognize a specific sequence within DNA and cut the DNA within that sequence at a specific point. In bacteria, these restriction enzymes operate a modification restriction system which modifies & cuts the foreign DNA entering into the bacterial cell & thus, provides immunity to bacterial cell.

Name of Restriction enzyme- EcoRI

Substrate DNA on which it acts



Action of Restriction enzyme



CBSE TEST PAPER-04

CLASS - XII BIOLOGY (Biotechnology & its Applications)

1. Name the genetically engineered human Insulin? [1]

2. Write the Scientific name of nematode that attacks the root of tobacco plant? [1]

3. Define a patent? [1]

4. What is Golden rice? What is its advantage? [2]

5. What are the three critical research areas in the field of Biotechnology? [2]

6. What are the advantages of molecular diagnostics over conventional methods? [2]

7. Describe with example, Why transgenic animals are produced? [3]

8. Describe how nematode – resistant transgenic plants have been obtained? [3]

9. What is Gene therapy – Illustrate using example of Adenosine deaminase deficiency? [5]

CBSE TEST PAPER-04

CLASS - XII BIOLOGY (Biotechnology & its Applications)

[ANSWERS]

Ans. 1 Humulin

Ans. 2 Meloidogyne incognitia.

Ans. 3 Patent is the government protection to the inventor of biological material, Securing to him for a specific time the exclusive right of manufacturing, exploiting, using & selling an invention.

Ans. 4 Golden rice is a transgenic variety of rice which contains a gene which codes for Vitamin A precursor. This variety have green yellow coloured grains and is rich in Vitamin A & thus nutritionally very advantageous.

Ans. 5
i) providing best catalyst in the form of improved organism usually in the form of microbe or pure enzyme.
ii) Creating optimal conditions through engineering for a catalyst to function.
iii) downstream processing to purify the protein / organic compound.

Ans. 6 In conventional methods, presence of pathogen is normally suspected only when pathogen has produced a disease symptom. By this time the concentration of pathogen is already very high in Body which could be harmful but with molecular diagnostics, Small amount of pathogen could be detected by amplification by PCR.

Ans. 7 Transgenic animals are produced for following purposes:-

i. To allow the study of how genes are regulated & how they affect normal function of body & its development eg. information obtained about biological role of insulin like growth factor.

ii. To increase our understanding on how genes contribute to development of diseases.

iii. To produce useful biological compounds by introducing a portion of DNA that codes for that product from other organisms, eg. α-1 antitrypsin, a protein used to treat emphysema.

iv. For testing the safety of vaccine eg. polio vaccine in transgenic mice.

v. To test the toxicity of drugs.

Ans. 8 A nematode Meloidogyne incognita infects tobacco plant & reduces its yield. The specific genes from parasite are introduced into plant using Agrobacterium. The genes are introduced in such a way that both sense & Antisense RNA are produced. Since these two RNAs are complementary, they form a double stranded RNA (ds RNA). This neutralizes the specific RNA of nematode by a process called RNA interference as a result, the parasite cannot live in transgenic host & plant is protected from the pest.

Ans. 9 Gene therapy is a collection of methods that allows correction of a gene defect. In this method, genes are inserted into the cells & tissues of an individual to correct certain hereditary diseases. It involves delivery of a normal gene into the individual or embryo to replace the defective mutant allele of the gene. Viruses which attack the host cell & introduce genetic material into host are used as vectors.

For example Adenosine deaminase (ADA) deficiency can be cured by bone marrow transplantation in some children but is not curative for Gene therapy, lymphocytes are grown in a culture & functional ADA, cDNA is introduced into these lymphocytes. These lymphocytes are then transferred into body of patient the patient requires infusion of such genetically engineered lymphocytes.

CBSE TEST PAPER-05

CLASS - XII BIOLOGY (Biotechnology & its Applications)

1.	Expand GEAC.	[1]
2.	Name the first transgenic cow?	[1]
3.	Which vaccine was being tested on mice?	[1]
4.	What are genetically modified organisms? Name two factors on which their behaviour depends?	[2]
5.	What do you mean by "Biopiracy" Give an example?	[2]
6.	What are transgenic Bacteria? Illustrate using any one example?	[2]
7.	Give any two examples of products, how transgenic animals can be used to produce biological compounds?	[2]
8.	What are Cry proteins? Name an organism that produces it. How has man exploited this protein to his benefit?	[3]
9.	Write an account on the production of human insulin in transgenic organisms.	[3]
10.	Compare & contrast the advantages & disadvantage of production of Genetically modified organisms?	[3]

CBSE TEST PAPER-05

CLASS - XII BIOLOGY (Biotechnology & its Applications)

[ANSWERS]

Ans. 1 Genetic Engineering Approval Committee.

Ans. 2 Dolly.

Ans. 3 Polio vaccine.

Ans. 4 Those organisms whose genes have been altered by manipulation, are called genetically modified organism or transgenic organisms. The two factors on which their behaviour depends:-

i) proper insertion of gene of interest.

ii) Proper harvesting of Genetically modified organisms to produce desired product.

Ans. 5 Biopiracy refers to the use of bio-resources lay multinational companies & other organizations without proper authorizations from the countries & people concerned eg. Basmati rice grown in India is distinct for its unique flavor & aroma but an American company got patent rights on Basmati through US patent.

Ans. 6 The bacteria in which genes of interest (i-e. foreign DNA fragment) have been introduced are calls transgenic bacteria eg. Ecol when two DNA sequences A & B chains of insulin are introduced into plasmid of this bacteria, then it is called transgenic bacteria & Start to produce insulin chain.

Ans. 7 i) Alpha-1-antitrypsin – a protein that is used to treat emphysema.

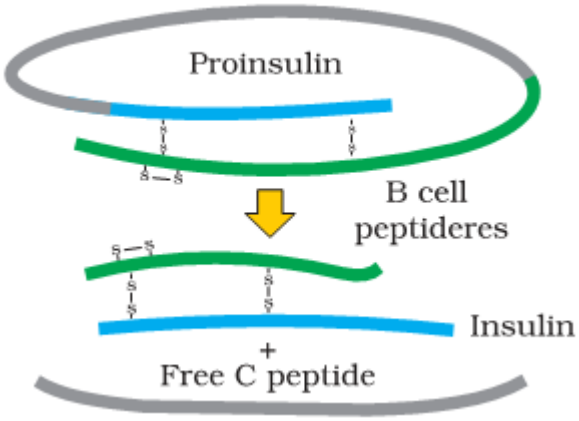
ii) Alpha – lactalbumin – protein – rich milk that is more nutritionally balanced product for human babies?

Ans. 8 The soil bacterium Bacillus thuringiensis produces crystal proteins called cry proteins that are toxic to larvae of insects like tobacco budworm, beetles & mosquitoes. The cry proteins exist as inactive protoxin & gets converted into active toxin when ingested lay the insect, as the alkaline pH of gut Solublises the

crystal. The activated toxia binds to surface of epithelial cells of midgut & create pores this causes lysis of cells leading to death of insects.

The genes encoding this protein are isolated from bacterium & incorporated into crop-plant to make them insect – resistant.

Ans. 9 Human insulin consists of two short polypeptide chains: chain A & B linked by disulfide bonds. Insulin is secreted as prohormone which has to be processed before it becomes a mature & functional hormone. The prohormone contains another polypeptides called C-peptide which is removed during maturation.



Using genetic engineering, the two DNA sequences coding for chains A & B of human insulin are introduced into plasmid of E – coli – to produce insulin. The two chains produced are extracted & combined by creating disulfide bridges.

Ans. 10 ADVANTAGES OF PRODUCING GMOS.

i) GM crops produce desired phenotypic traits in crop plants.

ii) The genes responsible for production of specific proteins are inserted into GM crops. These crops then produce that specific protein.

iii) Transgenic crops synthesizes new end product of specific biochemical pathway.

iv) These crops also help in preventing expression of existing native Gene.

DISADVANTAGES OF PRODUCING GMOS:

i) Transgenic crops may endanger wild & native species.

ii) GM crops may cause health problems by supplying allergens.

iii) GM crops may damage to the natural environment.

CBSE TEST PAPER-06

CLASS - XII BIOLOGY (Biotechnology & its Applications)

1.	Name the bacterium which is used to produce insect-resistant plants by genetic engineering.	[1]
2.	Name any disease against which vaccine is developed lay Recombinant DNA technology.	[1]
3.	Name the technique which is used to detect HIV in Suspected AIDS patient?	[1]
4.	Name any two diseases for which transgenic mice are used as model organisms.	[1]
5.	What is the difference between 'Cry' & 'CRY'.	[1]
6.	Name any one disease for which gene therapy has been proved effective?	[1]
7.	How is autoradiography used to detect a mutated gene?	[2]
8.	Why did Bacterial toxin does not kill the bacteria but only the insects?	[2]
9.	Mention any four applications of Biotechnology in the field of Agriculture?	[2]
10.	Why is recombinant Insulin produced by genetic engineering need to be processed?	[2]
11.	What is RNA Silencing? How is this strategy used to create pest – resistant plants?	[3]
12.	What are the steps involved in synthesis of genetically engineered insulin.	[3]

CBSE TEST PAPER-06

CLASS - XII BIOLOGY (Biotechnology & its Applications)

[ANSWERS]

Ans. 1 Bacillus thuringiensis.

Ans. 2 Hepatitis B vaccine.

Ans. 3 PCR (polymerase chain reaction)

Ans. 4 Rheumatoid Arthiritis & cystic fibrosis.

Ans. 5 Cry is the gene which codes for Bt-toxin which is an insecticidal protein while CRY is the protein coded by cry genes.

Ans. 6 Adenosine deaminase deficiency (ADA).

Ans. 7 A single stranded DNA or RNA tagged with radioactive molecule is allowed to hybridise to its complements DNA in a clone of cells followed by detection using autoradiography. The clone having the mutated gene will hence not appear on photographic film because probe will not have complementarily with mutated gene.

Ans. 8 Bacterial toxin does not kill the Bacillus because. But toxic protein exist as inactive protoxin but once an insect ingest the inactive protoxin it is converted into active form of toxin due to alkaline pH of gut which solublises the crystal. The activated toxin binds to surface of midgut epithelial cells & create pores that cause cell swelling & lysis.

Ans. 9
i) to made crops tolerant to abiotic stresses eg. cold, drought, salt, heat.
ii) to reduce reliance on chemical pesticide by producing pest-resistant crops.
iii) increased efficiency of mineral usage by plants.
iv) enhanced nutritional value of food eg. Vit – A rich golden rice.

Ans. 10 Recombinant Insulin produced by Genetic engineering need to be processed because insulin which is produced as proinsulin contains an additional C-peptide

apart from $\alpha-\&\beta$- chain of insulin so, to make an active insulin vaccine; a peptidase enzyme is added to proinsulin to cleave C peptide & rejoining of $\alpha-\&\beta-$ chain to form active Insulin.

Ans. 11 RNA silencing is a technique which involves silencing or disabling of specific mRNA due to complementary ds RNA molecule that binds to & prevent translation of mRNA. This strategy is used to prevent infection of roots of tobacco plants lay nematode Meloidegyne incognita. In this strategy, complementary ds RNA is produced against specific mRNA. The source of this complementary RNA could be from an infection by viruses having RNA genomes. Using Agrobacterium vector nematode specific genes were introduced into host plant. The introduction of DNA was such that it produced both sense & anti-dense RNA in the host cell. These two RNA's being complementary to each other formed a double strand RNA that initiated RNAi & thus silenced specific mRNA of the nematode. The consequence was that parasite could not survive in transgenic host.

Ans. 12 Steps involved in Insulin production are :-

i) for synthesis of Insulin, RNA is extracted from $\beta-$cells of islets of Langehans of pancreas.
ii) With the help of enzyme Reverse transcriptase, single stranded DNA complementary to mRNA is synthesized second strand of DNA complementary to first is synthesized with enzyme DNA polymerase.
iii) The two strands of copy DNA is joined to plasmid by using an enzyme called terminal transferase.
iv) The two ends of DNA get annealed by enzyme called ligase thus ends of inserted DNA & plasmid are sealed & a new circular plasmid is formed. This is a molecule of recombinant DNA.
v) This recombinant DNA is then inoculated in a new bacterial cell of E-coli & inserted in a bacterial gene after having cut by restriction enzyme.
vi) After proper expression of genes the bacterial cells of both cultures are lysed with appropriate chemicals. The fragments of insulin are then separated from enzyme by cyanogen bromide.

CBSE TEST PAPER-01

CLASS - XII BIOLOGY (Organism and Population)

1.	Why do leaves contains Sunken stomata?	[1]
2.	Name the type of interaction that is detrimental to both the interaction.	[1]
3.	What type of interaction is shown by sparrows eating the seeds?	[1]
4.	Distinguish between ectotherms & Endotherms?	[2]
5.	"Lichens are considered good examples of obligate mutualisms". Comment?	[2]
6.	Give any two examples of defense mechanism in plants against herbivory?	[2]
7.	What is Brood parasitism? Give an example. What adaptation has evolved in this phenomenon?	[2]
8.	Describe the specific adaptation of xerophytes with respect to root system, stem & leaves.	[3]
9.	List the important characteristics of a population & Explain?	[3]

CBSE TEST PAPER-01

CLASS - XII BIOLOGY (Organism and Population)

[ANSWERS]

Ans. 1 Leaves contains sunken stomata i.e. Stomata arranged in deep pits to minimizes water loss by transpiration.

Ans. 2 Competition.

Ans. 3 Predation.

Ans. 4 Ectotherms are those animals whose body temperature changes & matches with that of environment in which they are living whereas Endotherms are those animal whose body temperature is maintained relatively constant by physiological regulation.

Ans. 5 Lichens show an intimate mutualistic relationship between a fungus & an algae or cynobacterium where the fungus helps in absorption of nutrients & provides it to bacteria while the algae or cyanobacterium prepares the food.

Ans. 6
i) plants develops certain morphological means of defense e.g. thorns in bougainvillea & spines in cactus.
ii) plants produce & store certain chemicals which functions with by directly killing them or by inhibiting them from feeding .

Ans. 7 Brood parasitism refers to the phenomenon in which one bird species by its eggs in the nest of another bird species Evolution has occurred in such a way the eggs of the parasitic birds resemble those of the host bird in size, colour etc to avoid host bird detecting the foreign eggs & ejecting them from the nest e.g. cuckoo bird lays eggs in the nest of crow. It is considered as a parasitic type of inter specific interaction because in this relationship the parasite i.e. eggs of cuckoo

birds depends on crow's nest for its food & shelter but the crow is harmed because there is competition for limited food and shelter amongst the crow's egg & cuckoo's egg thus, in parasitic interspecific interaction the parasite is benefited while the host is harmed.

Ans. 8

i) ADAPTATIONS INROOTS :- Xerophytes have well developed & extensively branched long root system. While some perennial xerophytes of succulent nature possess extensive but shallow root system. They can absorb water from dew drops & small rain droplets.

ii) ADAPTATION IN STEM:- stems of woody xerophytes are comparatively stunted hard & rigid. They may be covered with thick e.g. Acacia main stem & branches may occur as think, fleshy, flattened & green modified structure called phylloclade.

iii) ADAPTATION IN LEAVES:- Leaves are usually short sized which decreases the chances of getting over – heated when exposed to solar radiation & thus by reducing rate of transpiration. Leaves of xerophytes are usually thick, fleshy green & leathery which are known to store water.

Ans. 9

A population has following four major characteristics :-

i) Population Density :- The size of a population in relation to a definite unit of space is termed as population density. The maximum limit of density depends upon energy flow in an ecosystem, nutritional status of trophic level & metabolic equilibrium. Population density can be mathematically calculated

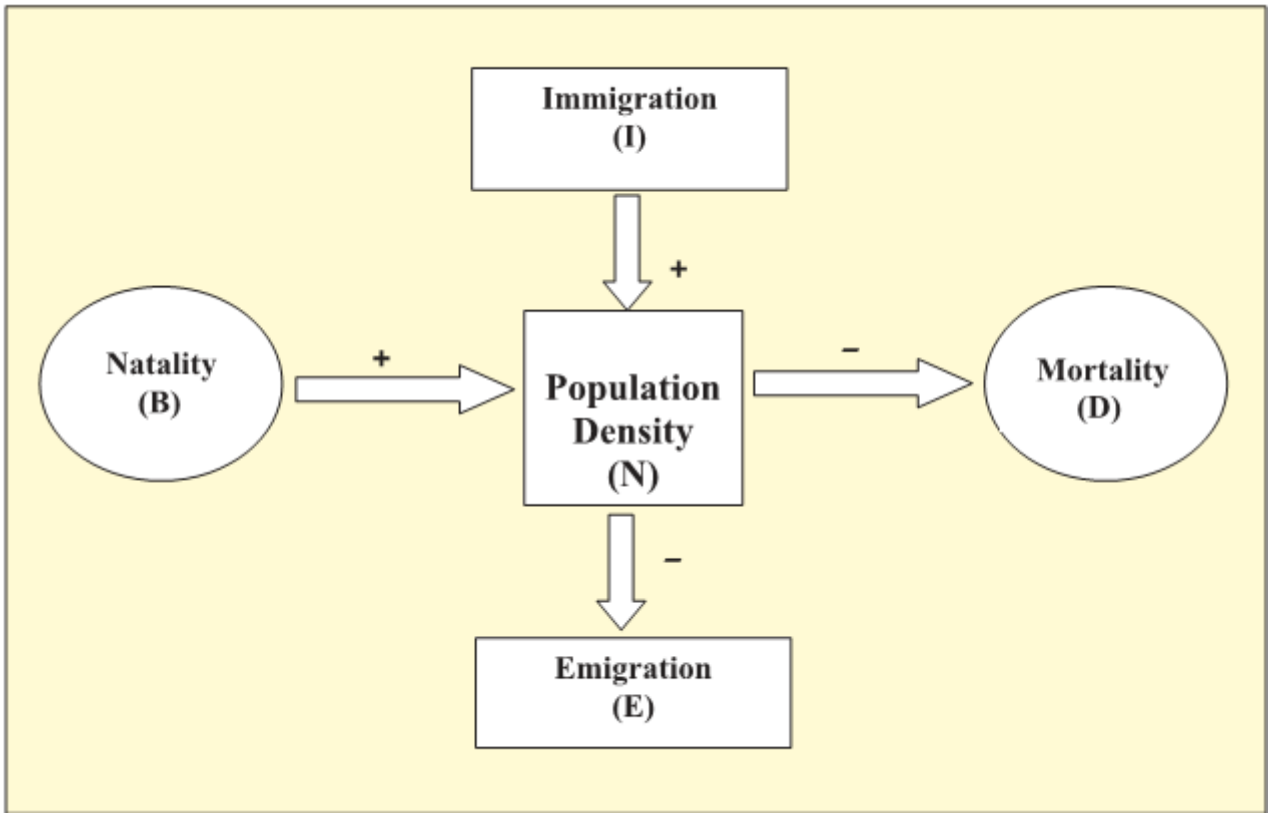
as : $D = \frac{N/a}{t}$

ii) Birth Rate / Natality :- The birth rate or natality denotes the produced number of new individuals by any natural method in per unit time. The birth can be expressed lay formula $B = \frac{Nn}{t}$

iii) Death Rate / Mortality :- It refers to death rate of individuals in the population. It is expressed in as number of individual dying in a given period.

$$\text{Death Rate} = \frac{no \text{ of death in population}}{Time}$$

iv) Carrying Capacity:- Each habitat or ecosystem has a certain space which can accommodate a finite number of organisms depending on its size & productivity. This is called carrying capacity



CBSE TEST PAPER-02

CLASS - XII BIOLOGY (Organism and Population)

1. Define homeostasis? [1]

2. Give an example of suspension? [1]

3. What is Allen's rule? [1]

4. An orchid plant is growing on the branch of mango tree. How do you describe this interaction between the orchid & the mango tree? [2]

5. State Gauss's competitive exclusion principle? [2]

6. What is migration? Why do animals show this phenomenon? [2]

7. Describe the specific adaptations of hydrophytes with respect to roots, stem & leaves? [3]

8. Name & explain the bind of interaction in the following. [3]

   i) Algae & fungi in
   ii) Head louse & humans
   iii) Hermit crab & sea anemone

9. Describe the exponential growth model of a diagram along with a curve? [5]

CBSE TEST PAPER-02

CLASS - XII BIOLOGY (Organism and Population)

[ANSWERS]

Ans. 1 Homeostasis refers to the maintenance of a steady internal environment by organisms.

Ans. 2 Hibernation is frogs, reptiles or polar bear.

Ans. 3 Mammals living in colder regions have short ears & limbs to minimise heat loss.

Ans. 4 Orchids grows as epiphytes on mango tree. This is an example of commensalism in which orchids are benefited by getting a shelter while the tree is neither benefited nor harmed.

Ans. 5 Gause's competitive exclusion principle states that two closely related species competing for the same resources cannot exist together as the competitively inferior one will be eliminated but this is true only when resources are limiting & not otherwise.

Ans. 6 Migration is a phenomenon in which organisms can move away temporarily from the stressful conditions in the habitat with hospitable conditions e.g. birds undertake long distance migration during winter.

Ans. 7

i) ADAPTATIONS IN ROOTS:- Root system is feebly developed & unbranched some floating plants or submerged plants lack roots Root hairs are absent except rooted floating hydrophyte. True root caps are absent.

ii) ADAPTATIONS IN STEM :- In submerged hydrophytes, stems are long slender & flexible whereas in the free – floating hydrophytes stem are modified as thick, stout, stoloniferous & occur horizontal on water surface.

iii) ADAPTATIONS IN LEAVES:- Leaves are thin, long, ribbon shapes submerged forms. In free floating plants, the petioles of leaves show indefinite power of growth.

Ans. 8

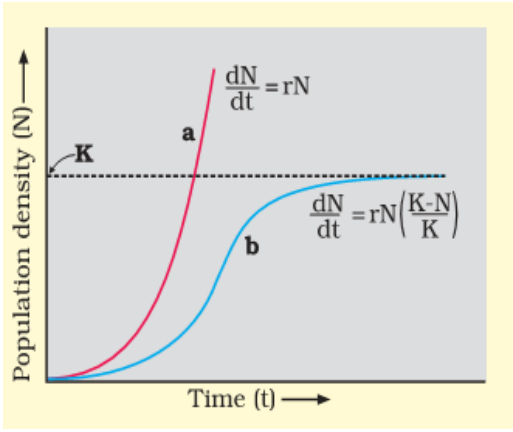
i) Algae & fungi in lichens :- Lichens shows an intimate mutualistic interaction in with both fungus helps in absorption of nutrients & provides protection, while algae or cyanobacterium prepares the food.

ii) Head louse & humans:- Head louse shows ectoparasitism on humans in which head louse is getting nutrition from human body & is thus benefited while human beings are harmed.

iii) Hermit crab & sea anemone:- Hermit crab & sea anemone shows commensalism as hermit crab is benefited because it gets protection from predators which stays away from stinging tentacles of the sea anemone.

Ans. 9

This kind of curve is observed in the case of under population of reindeer growing in a predator free natural environment having plenty of food. In this case, the curve formed is J-curve the small population first takes time to adjust into new environment so there is no increase in the population. Once they get adapted they multiply exponentially. This growth & multiplication continues so far the food is available. After sometime the food supply becomes less as compared to the population increases. This causes mass starvation & mortality & results in the formation of J-shaped curve



The J-shaped growth form is described by equation

$$\frac{\Delta N}{\Delta t} = \text{rN or } \frac{\Delta N}{\Delta t N}$$

CBSE TEST PAPER-03

CLASS - XII BIOLOGY (Organism and Population)

1. "Cuckoo bird lays eggs in the nest of crow" which type of interaction is shown in this relation? [1]

2. Give one function of aerenchyma in aquatic plants? [1]

3. What does J-shaped curve indicates? [1]

4. How do desert lizards maintain a fairly constant body temperature? [2]

5. Differentiate between Hibernation & aestivation? [2]

6. Name the bind of interaction present between the following :- [2]

   i) Indian Nightingale & crow
   ii) Nodulated roots & rhizobium
   iii) Plasmoduim & man
   iv) Orchids & Mongo tree

7. Mention the different defense mechanism to reduce the impact of predation? [3]

8. Mutualism often involves co-evolution of mutualists. Describe taking the example of animal plant (wasp-fig) relationship. [3]

9. Describe the logistic growth model of population along with a suitable curve. Why is this curve more realistic? [5]

CBSE TEST PAPER-03

CLASS - XII BIOLOGY (Organism and Population)

[ANSWERS]

Ans. 1 Brood parasitism.

Ans. 2 Aerenchyma in aquatic plants provides buoyancy & helps them in floating.

Ans. 3 J-shaped curve indicates that the resources are unlimited in a habitat.

Ans. 4 Desert lizards manage to deal with high temperature by keeping their body temperature fairly constant by behavioral means. They bask in the sun & absorb heat when their body temperature is below the comfort level & move into shade when it is higher.

Ans. 5 Hibernation is the phenomenon of spending cold period in inactive stage by an animal whereas aestivation is the phenomenon of spending dry & hot conditions in an inactive stage by animal.

Ans. 6
i) Indian Nightingale & crow :- Brood parasitism
ii) Nodulated roots & rhizobium :- Mutualism
iii) Plasmoduim & man :- Perasitism
iv) Orchids & Mongo tree :- Commensalism.

Ans. 7 plant species evolved various defense mechanism to reduce impact of predation :-

i) Certain insect species & frogs have camouflage or cryptic colouration to avoid detection by their predators.

ii) Some animals like monarch butterfly are highly distasteful to their predators because they accumulate a certain chemical by feeding on poisonous weeds during its caterpillar stage.

iii) Some prey are poisonous & hence are avoided by predators .

iv) Plants have evolved certain morphological, or chemical defense mechanism against herbivores e.g. thorns in bougainvillea.

v) plants also produce certain chemicals which functions as :-

They make animal feel sick.

They may inhibit them from feeding.

They may interfere with digestion.

They may directly kill them.

Ans. 8 Plants need the help of animals for pollination their flowers & dispersing their seeds. Animals obviously have to be paid fees for the services that plants expect from them. Plants offer rewards or fees in the form of seed dispersers "plant – animal interactions often involve co-evolution of the mutualists that is, the evolution of the flower & its pollinator species can be pollinated only by its partner wasp species & no other species. The female wasp uses the fruit not only as an oviposition site but uses the developing seeds within the fruit for nourishing its larvae. The wasp pollinates the fig inflorescence while searching for suitable egg-laying sites. In return for the favors of pollination the fig offers the wasp some of its developing seeds as food for the developing wasp larvae.

Ans. 9 The logistic growth curve shows a sigmoid or a S-shaped curve. It has three phases:-

(i) Lag-phase :- It is the early phase of little or no growth. Lag phase is one in which under population of cells adapt to or stablises with the growth conditions before embarking up their multiplication.

(ii) Log phase or Exponential phase :- It is the middle phase of rapid or geometric rise, Once stabilized cells starts to multiply rapidly when the small population is stablised, the multiply becomes faster because of the plenty amount of food & other requirements of life.

(iii) Stationary phase or steady phase:- Soon after the amount of food decreases in proportion to the number of cells & this results in the onset of stationary phase. During this phase, the number of new cells produced is roughly equal to the number of cells dead & so there is no net increase in the number of cells.

Sigmoid growth curve is demonstrated by formula

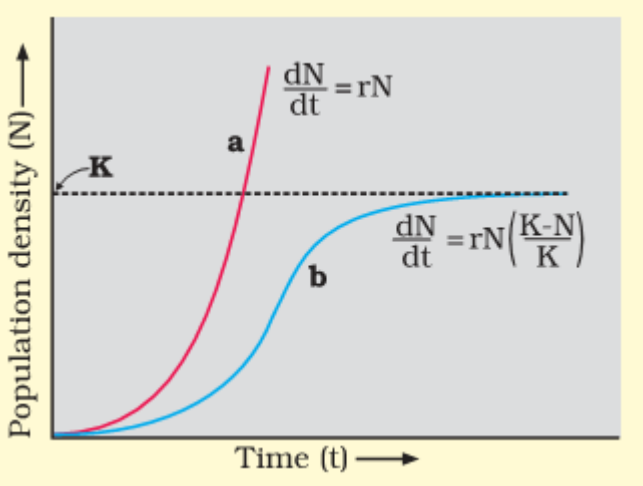
$$\frac{\Delta N}{\Delta t} = rN\,\frac{(K-N)}{N}$$

ΔN – rate of change inpopulation

Δt - change in time.

K – carrying capacity

R – biotic potential



CBSE TEST PAPER-04

CLASS - XII BIOLOGY (Organism and Population)

1.	Name the type of interaction in which one species is harmed while other is neither benefitted nor harmed?	[1]
2.	Why are calotropis plants not browsed by herbivores?	[1]
3.	What are the two primary requirements of a parasite from host?	[1]
4.	Define carrying capacity?	[2]
5.	If a marine fish is placed in fresh water aquarium, will the fish be able to survive. Why or why not?	[2]
6.	Out of the two population growth models, which one is more realistic & Why?	[2]
7.	How do kangaroo rats live in the absence of water in North American deserts?	[3]
8.	How is diapause different from Hibernation?	[3]
9.	Give an example to show that completely unrelated species can also compete for same resources?	[5]
10.	What is Age pyramid? What are the different types of age pyramid?	[5]
11.	Differentiate between regulators & conformers? Why do small animals do not show regulations?	[5]

CBSE TEST PAPER-04

CLASS - XII BIOLOGY (Organism and Population)

[ANSWERS]

Ans.1. Ammensalism.

Ans. 2. Because calotropis plant produces a highly poisonous glycoside that is a cardiac poison & thus, directly kills the predator.

Ans.3. Food & shelter.

Ans.4. The maximum number of individuals of a population that can be sustained by a given habitat is called its carrying capacity.

Ans.5. No, marine fish is unable to survive in a fresh water aquarium because they are adapted to live in saline sea water. They are unable to cope with outside hypotonic environment because of Osmoregulation problem.

Ans.6. Logistic or S-shaped growth curve is more realistic because no population can continue to grow exponentially, as the resource availability becomes limiting at certain point of time.

Ans.7. The kangaroo rat in North American deserts is capable of meeting all its water requirement through its internal oxidation of fat, where water is by-product, it can also concentrate its urine to a minimal volume.

Ans.8. Diapauses is the phenomenon of spending unfavourable climatic conditions by insects during their development whereas. Hibernation is a phenomenon of spending the winter in a resting or dormant conditions by cold – blooded animals to escape cold by hiding them in hollow tree trunk or burro or caves etc, revealing minimum physiological activity.

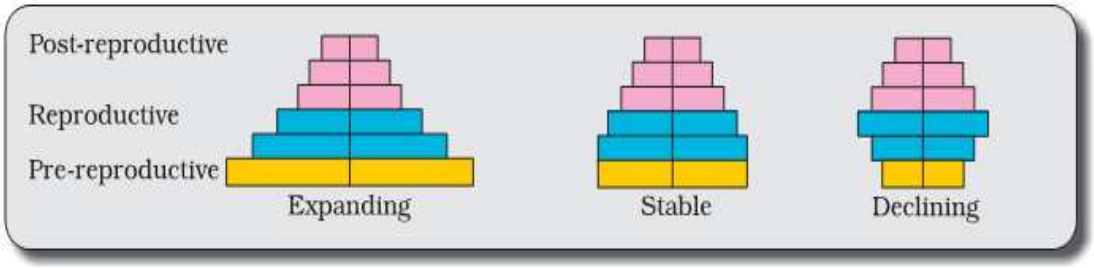
Ans.9. Completely unrelated species can also compete for same resources for e.g. In certain shallow lakes of South America the visiting flamingoes & the native fishes compete for the same zooplanktons as their food.

Ans.10. The geometrical diagrammatic representation of different age groups in a population of any organism is called Age of pyramids. These are of three types:-

i) Expanding pyramid:- It is a broad base, triangular pyramid which represents a population containing large number of young people. It is rapidly expanding population with high birth rate.

ii) Stable pyramid:- It represents a moderate proportion of young to old. As the rate of growth becomes slow & stable i.e.- pre-reproductive & reproductive age groups becomes more or less equal in size.

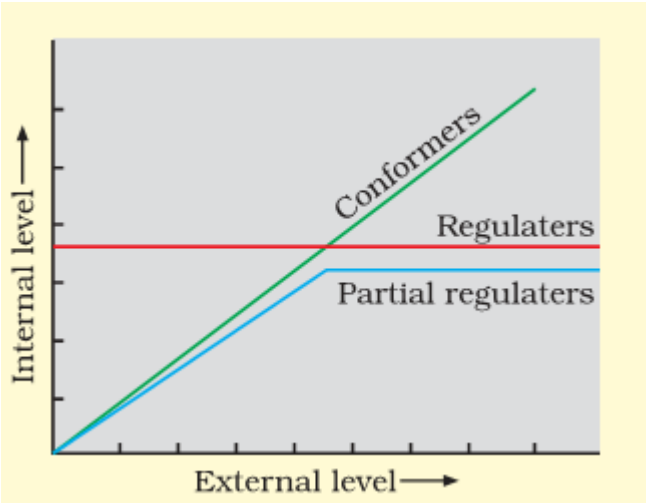
iii) Declining Pyramid:- The type of pyramid of population decreasing in size is characterised by a narrow base because there are fewer pre-reproductive individuals than in the other two age categories.



Ans.11. The organisms which maintain homeostasis by physiological or behavioral means & ensures a constant body temperature & constant osmotic concentration etc. are called regulators e.g. all birds, mammals some lower vertebrates & invertebrates, for example in summer, when outside temp is more than our body temperature we sweat profusely evaporative cooling brings the body temp – down.

Whereas those organisms which cannot maintain a constant internal environment. Their body temperature changes with ambient temperature e.g. majority of animals & nearly all plants.

Small organisms does not show regulation because thermoregulation is an energy – expensive process. Since small animals have large surface area relative to volume, they tend to lose body heat very fast when it is cold outside they have to expend much energy to generate body heat through metabolism.



CBSE TEST PAPER-05

CLASS - XII BIOLOGY (Organism and Population)

1. What is the ecological principle behind biological control method of managing pest insects. [1]

2. Write the equation for verhulst – poarl logistic growth of population. [1]

3. Name the mechanism employed by ophrys to get its flowers pollinated? [1]

4. List any two factors which determine the nature of soil? [1]

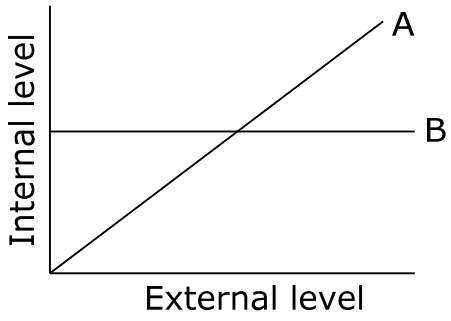
5. What role do predators play in an ecosystem? [2]

6. Most living organisms cannot survive at temperature above 45^0c. How are some microbes able to live in habitat with temperature exceeding 100^0c. [2]

7. Give below is a graph depicting organismic response to changing external condition. Name the type of organisms which will show:- [2]

   i) pattern A

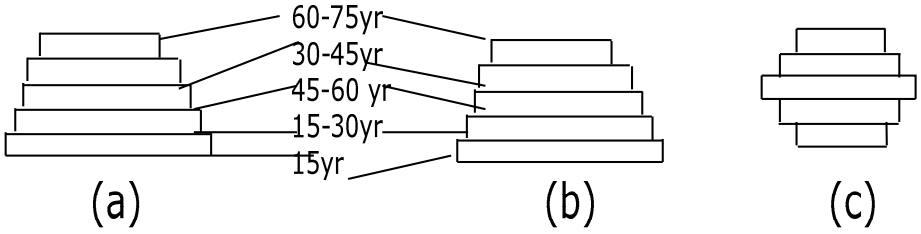
   ii) pattern B



8. Mention any two ways in which organisms tide over unfavourable conditions by suspending their activities. [2]

9. Why are predators "prudent in nature? [2]

10. Study the three representative figures of age of pyramid relating to human population & answer the following question.

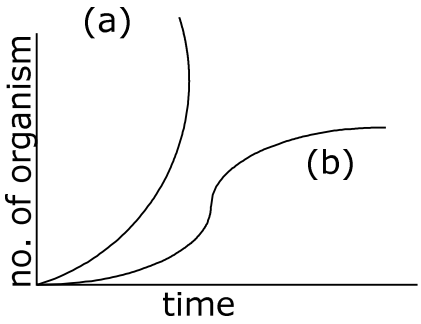


i) Mention the given to the three binds of age profile (a), (b) and (c)

ii) Which one of them is ideal for a population & why.

iii) How do such age – profile helps policy making concerned about our growing population & prepare for future generation.

11. In the adjacent population growth curve :-



i) What is the name given to curve (a) & (b).

ii) What is the status of food & space in the curve (a) & (b).

iii) In absence of predators, which curve "a" or "b" would appropriately depict the prey population?

iv) When does curve 'b' changes into curve 'a'.

CBSE TEST PAPER-05

CLASS - XII BIOLOGY (Organism and Population)

[ANSWERS]

Ans.1. Predation, where predators prey upon pests & control their number.

Ans.2.

$$\frac{\Delta N}{\Delta t} = \frac{rN(K-N)}{K}$$

Ans.3. Mutualism.

Ans.4. Climate & weathering process.

Ans.5. Predators plays an important role in ecosystem :-

i) They act as conduct for energy transfer to higher trophic level.

ii) They keep the prey population under control which otherwise can reach very high population density.

iii) They help in maintaining species diversity in a community.

Ans.6. Some microbes are able to live in habitats with temperate exceeding 100^0 c because they possess minimum amount of free water in their body. Removal of water provide resistance to high temperature.

Ans.7. i) Conformers shows pattern A where body temperature changes with the ambient temperature.

ii) Regulators shows pattern B where body temperature remains constant.

Ans.8. i) Hibernation – phenomenon of spending cold period in inactive stage by an animal e.g. frog, reptiles, polar bear.

ii) Aestivation – phenomenon of spending dry & hot conditions in an inactive stage by an animal e.g. snail, fishes.

Ans.9. Predators are said to be prudent in nature because if a predator is too efficient & overexploit its prey, then the prey might become extinct & following it the predator will also become extinct for lacking of food.

Ans.10. i) (a) is called young population
(b) is called stable population
(c) is called declining population

ii) Among the three, stable population is ideal because it has identical birth death rate.

iii) Age profile helps policy makers get concerned about our wing population & to make on idea for future population growth so that they make future plans.

Ans.11. i) Curve (a) is known as exponential growth curve & curve (b) is known as logistic growth curve.

ii) Food & space is less in curve 'a' whereas plenty of food & space is available in curve 'b'.

iii) Curve "a".

iv) When the food resources in a given place become unlimited the curve (b) assumes a J – shape & changes into curve (a).

CBSE TEST PAPER-06

CLASS - XII BIOLOGY (Ecosystem)

1.	Name any two man – made ecosystem?	[1]
2.	Define stratification?	[1]
3.	Name the ecological pyramid that is always upright?	[1]
4.	Why is secondary sucession faster than primary sucession?	[2]
5.	Distinguish between upright & inverted pyramids?	[2]
6.	Explain with an example, why is the length of a food chain in an ecosystem generally limited to 3-4 tropic level?	[2]
7.	What is meant by ecological succession? Describe the different stages in which succession occurs?	[2]
8.	What is meant by ecological pyramid? With the help of one example each, show that pyramid of number can be both upright as well as inverted.	[2]
9.	Describe the components of an ecosystem?	[2]

CBSE TEST PAPER-06

CLASS - XII BIOLOGY (Ecosystem)

[ANSWERS]

Ans.1. Aquarium & Garden.

Ans.2. Stratification in an ecosystem refers to the vertical distribution of different species occupying different levels.

Ans.3. Pyramid of energy.

Ans4. Secondary succession refers to community development on sites previously occupied by well-developed communities where the environment is both organic & inorganic. Since these bare areas possesses suitable soil for proper growth so, secondary successes is more rapid them primary succession.

Ans.5. In upright pyramid the number of producers or its biome is maximum in an ecosystem & it decreases progressively at each trophic level. Whereas in inverted pyramid at producer level is minimum & is increasing progressively at each trophic level in a food chain.

Ans.6. In a food chain at each trophic level about 90% of energy is degraded into heat & only 10% energy is transferred to next tropic level thus of trophic levels in the food chain the amount energy to be transferred to next trophic level will be approximately negligible thus a food chain is generally limited to 3-4 trophic levels.

Ans.7. Ecological succession is a community – controlled phenomenon in which the structure & composition of community changes in an orderly & sequential manner, leading ultimately to establishment climax community.

STAGES OF SUCESSION :-

i) Invasion :- Invasion is the arrival of propagating organ e.g. seed spores bulbils etc on a bare area of primary or secondary succession. Those for which conditions are favorable germinate is new area & some of them grow into mature plants. These new arrivals from outside are called pioneer.

ii) Establishment :- The process by which migrants adjust themselves in new areas after migration is called ecesis. It consists of three essential processes – germination, growth & reproduction.

iii) Aggregation :- The coming together of individuals of various species in an area are called aggregation.

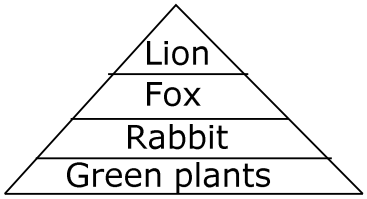
iv) Competition :- The species which have similar requirements of nutrition are known as competitive species eg. those with different requirement are complimentary species.

v) Reaction :- It is the change brought about by colonizers in the habitat. The influence of vegetation on the site is called reaction till a stable community develops in that area.

Ans.8. The graphic representation of the trophic structure of a food chain is known as ecological pyramid. The ecological pyramid of number represents the numerical representation between different trophic both upright or inverted.

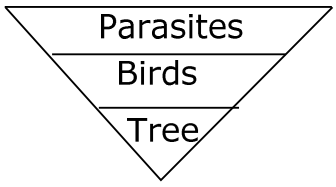
In upright pyramid of numbers, the more abundant species form the first trophic level & forms the base of pyramid & less abundant species remains near the top e.g. Grass land ecosystem.

Green plants $\rightarrow$ Rabbit $\rightarrow$ fox $\rightarrow$ Lion



In inverted pyramid of number, the most abundant species occurs at the top while the less abundant species forms the base eg. Tree ecosystem

Tree → Birds → Parasite



Ans.9. Ecosystem is a functional unit of nature consisting of biotic & abiotic factors where the living organisms interact among themselves & with physical environment. Ecosystem consists of two components:-

i) ABIOTIC COMPONENTS :- e.g.

a) Inorganic substances phosphorus, sulphur, carbon, nitrogen hydrogen tec.

b) Organic substances e.g. carbohydrates, proteins, lipids.

c) Climatic regime e.g. light, humidity, rainfall, temperature.

ii) BIOTIC COMPONENTS:

a) Producers :- The organisms which produce food for themselves & for all living organism from inorganic raw material with the solar radiation are called producers.

b) Consumers :- Those living heterotrophic members of ecosystem which consume the food synthesized lay producers. They are broadly classified as.

i) Primary consumers:- They are directly dependent on producers called herbivores e.g. rat, deer, cow, goat,.

ii) Secondary consumers:- The organism that use primary consumers as their food are called carnivores e.g. fox cats, lions.

iii) Tertiary consumers:- These are top carnivores which prey upon other carnivores, & herbivores e.g. crow, man.

c) Decomposers :- Organism that break up the dead bodies of plants animals & the related waste products are called decomposers e.g. bacteria, Fungi etc.

CBSE TEST PAPER-07

CLASS - XII BIOLOGY (Ecosystem)

1. Name the trophic level occupied by secondary consumers & tertiary consumers? [1]

2. Define standing crop? [1]

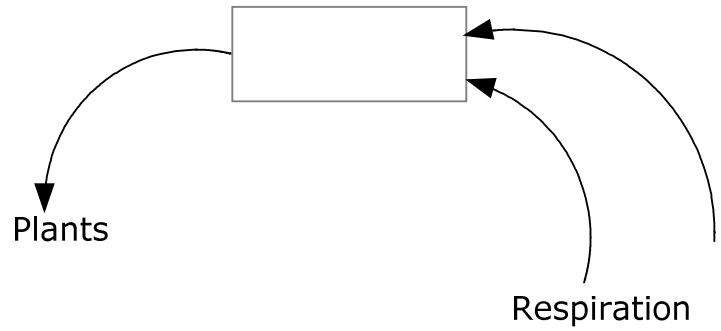
3. Name the ecological pyramid that is inverted in tree ecosystem? [1]

4. "Energy flow in an ecosystem is always unidirectional justify the statement. [2]

5. Differentiate between Production & decomposition? [2]

6. Explain who pyramid of energy of an ecosystem is always uprights never inverted? [2]

7. [2]



   i) Name the compound whose cycle is depicted.
   ii) In what way do vehicles add this compound to atmosphere?
   iii) What adverse effect does its excess have on the environment?
   iv) Cite an event which depicts this effect in modern times.
   v) Suggest two ways of depleting this effect.

8. What do you mean by "productivity of an ecosystem? What are the types of productivity also mention the factors on which productivity of an ecosystem depends? [2]

9. What is decomposition – Describe the different processes involved in decomposition? [2]

CBSE TEST PAPER-07

CLASS - XII BIOLOGY (Ecosystem)

[ANSWERS]

Ans.1. Third trophic level & fourth trophic level respectively

Ans.2. The amount of living matter or biomass present at every tropic level is known as standing crop.

Ans.3. Pyramid of Number.

Ans.4. Energy flow in an ecosystem is always unidirectional means that energy is always transferred from one trophic level to next trophic level & is not reverted back – e.g. energy from sun is captured by producers which are then eaten by primary consumer & energy is transferred to next tropic level.

Ans.5. Production refers to the process of synthesis of organic food materials from inorganic substances such as CO_2 H_2O in the presence of sunlight whereas decomposition is a process of breakdown of complex substances into its constituents & it is brought about by bacteria, fungi etc.

Ans.6. The pyramid of energy represents total amount of energy utilized by different trophic level organism in unit area. At each level, total energy available is relatively more than at higher trophic level because of loss of energy from one trophic level to other thus, pyramid of energy is always straight.

Ans.7. i) Carbon cycle

ii) By burning of fossil fuel e.g. diesel or petroleum, they introduce CO_2 in the atmosphere

iii) Environmental pollution.

iv) Ozone layer depletion

v) a) By reducing use of fossil fuels

b) By planting more & more trees.

Ans.8. Productivity of an ecosystem is the rate at which solar radiations energy is fixed by vegetation of an ecosystem per unit area & per unit time. It is general expressed in terms of unit of energy (cal) produced in a unit area (m^2) per unit time (year).

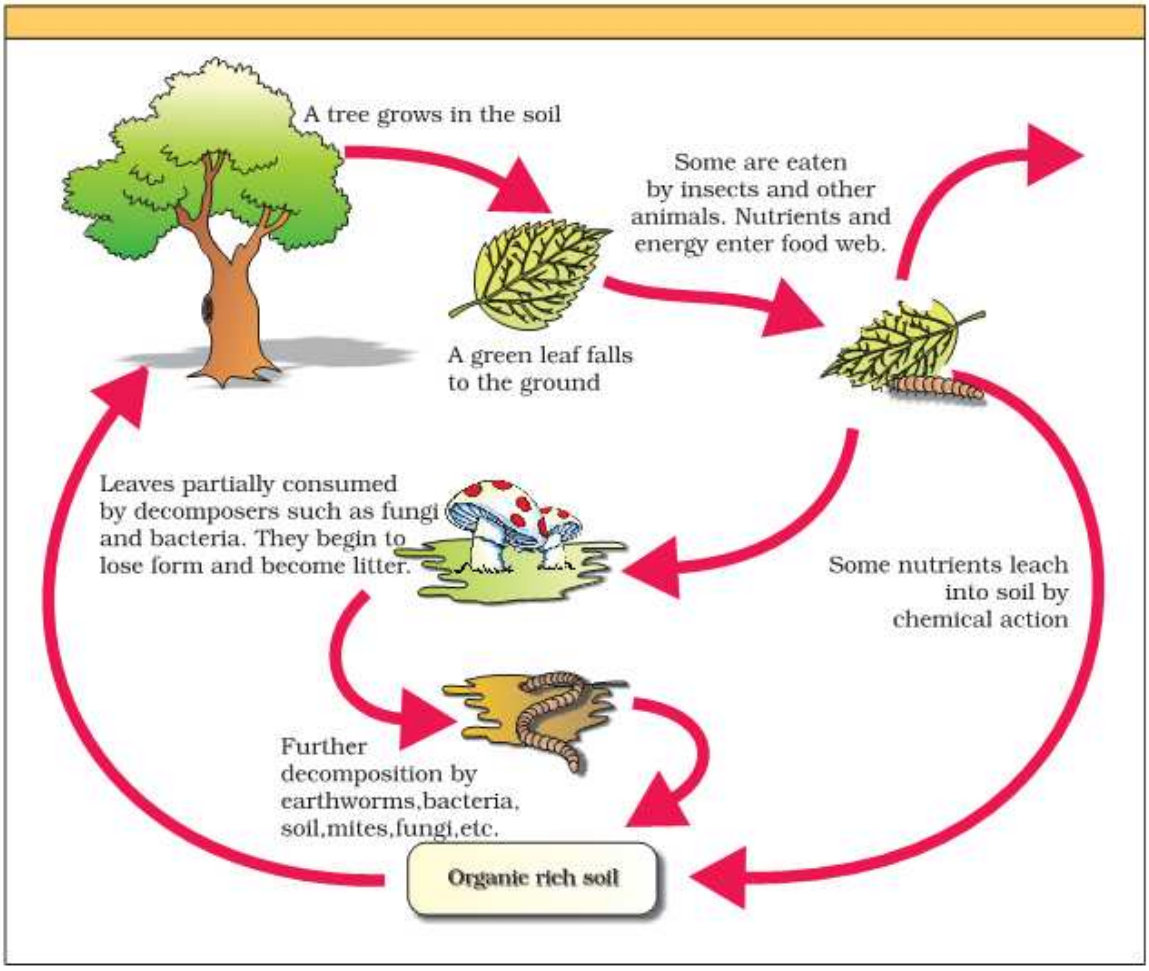
Productivity can be of two types:-

1) Primary Productivity:- It is defined as the amount of biomass or organic matter produced per unit area over a time period by plants during photosynthesis primary productivity can further be of two types:-
   a) Gross primary productivity :- It refers to the total amount of food formed lay producers.
   b) Net primary productivity:- It refers to gross production minus loss lay respiration & decomposition NPP = GPP – respiration loss
2) Secondary Productivity :- The rate of storage at consumer level is secondary productivity. It is the rate of resynthesis of organic food by consumers primary productivity depends on:-
   i) a number of environmental factors
   ii) availability of nutrients.
   iii) photosynthetic capacity of plants.

Ans9. Decomposers e.g. bacteria, fungi etc. helps in breakdown of complex organic matter into inorganic substances like CO_2, water minerals & this process is called decomposition. Dead plant remains e.g. leaves, bark flowers & dead remain of animals including faecal matter constitute detritus. The important processes involved in decomposition or :-

i) Fragmentation :- Detritivores breaks down detritus into smaller particles.
ii) Leaching :- Water soluble inorganic nutrients go down into soil horizon & get precipitated as unavailable salts lay process of leaching.
iii) Catabolism:- The enzymes of bacteria & fungi degrade detritus into simple inorganic substances
iv) Humification :- Humification leads to accumulation of a dark colored amorphous substance called humus that is highly resistant to microbial action & undergoes decomposition at extremely slower rate.

v) Mineralisation :- The humus is further degraded by some microbes & release of inorganic nutrients occurs by the process of mineralization.



CBSE TEST PAPER-08

CLASS - XII BIOLOGY (Ecosystem)

1. What are the products of decomposition? [1]

2. What is 10% law? [1]

3. Mention one similarity between hydrach & Xerach secession? [1]

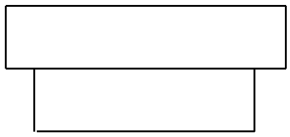
4. What is the approximate value of net primary productivity of biosphere? [1]

5. Why is productivity of coral reef maximum? [2]

6. In the pyramid of biomass, drawn below, name the two crops:- [2]

   i) one which is supported & the one which supports

   ii) In which ecosystem is such a pyramid found.



7. Differentiate between primary productivity & secondary productivity? [2]

8. What ecological principles are derived from the study of food chains? [2]

9. With the help of a diagram, represent the energy flow through different trophic level? [3]

10. Represent schematically & describe the phosphorus cycle in an ecosystem? [5]

CBSE TEST PAPER-08

CLASS - XII BIOLOGY (Ecosystem)

[ANSWERS]

Ans.1. CO_2, H_2O & nutrients.

Ans.2. At each trophic level, 90% energy is degraded into heat & only 10% is transferred to next trophic level this rule is called 10% law.

Ans.3. Both hydrach & xerach leads to establishment of similar mesic conditions.

Ans.4. 170 billion tons.

Ans.5. The productivity of coral reef is maximum because of availability of good light, enough warm water and abundant nutrients.

Ans.6. i) In this ecosystems bird is supported & insect supports.
ii) Such type of pyramid is found in ecosystem of pond or tree.

Ans.7. Primary productivity refers to productivity at trophic level i.e. food energy formed by way of photosynthesis using solar energy whereas secondary productivity refers to gross productivity minus losses by way of respiration & decomposition.

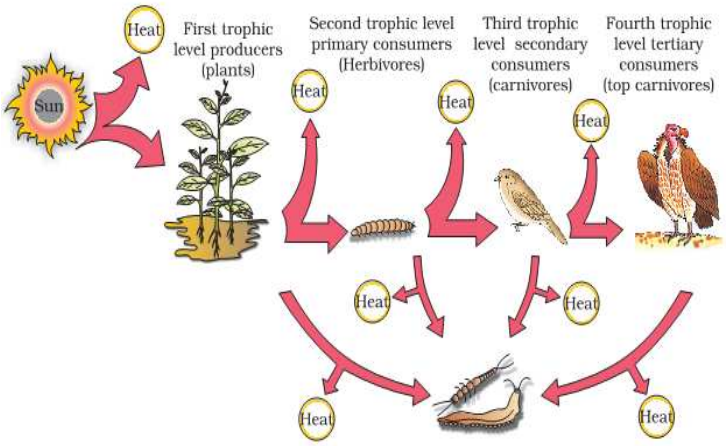
Ans.8. i) Each food chain is complete & self – containing
ii) All the food chains must always begin with photosynthesis & ends with decay
iii) Shorter food chains are more efficient because the more steps it has, greater the wastage of energy.
iv) The successive members of food chains are large in size but fewer in number.

Ans.9. In an ecosystem, energy flows through different trophic level by food chain. In consists of two steps:-

i) Trapping solar energy:- Primary source of energy is sun only 48% of sun's energy reaches the surface of earth & only a part of it is used lay plants for photosynthesis. The chemical energy produced lay plants is stored in plant

tissues. The photosynthetic organism uses a part of this chemical energy & transfer the rest to organism at next trophic level.

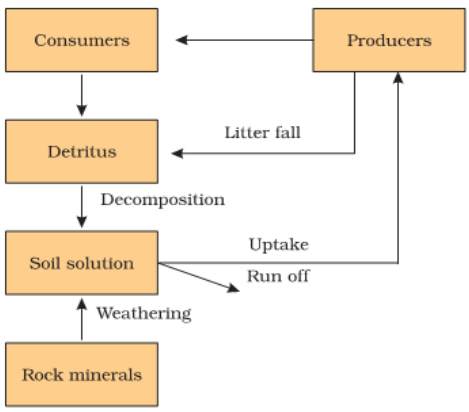
ii) Path & flow of energy:- The primary consumers therefore take chemical potential energy in the form of food. Most of it dissipates as heat during respiration & is lost out of ecosystem. The same process is repeated at secondary consumers, at each trophic level 90% energy is degraded into heat & only 10% is then transferred to next trophic level this rule of energy flow is called ten percent law.



Ans.10. The major reservoir of phosphorus is sedimentary rocks which are only available to basic cycle in small amounts as a result of weathering. These phosphorus are weathered & later transported to the soil by wind & water, where they exist as inorganic dissolved phosphates.

The basic phosphorus cycle begins with dissolved phosphates which are absorbed by plants for making their own tissue plants are eaten by animals. Decay bacteria breakdown the tissue of dead animals down these product & return phosphate to soil.

The water – soluble phosphates is lost to the deep rudiments of the ocean through run-off. The major pathway of returning phosphorus to land is uplifting of marine sediments. Some amount of phosphorus is returned to absorb inorganic phosphate, when they die, most of absorbed phosphate is recycled back into ambient mater. This sort of cycling is called biological cycle or metabolic cycle.



CBSE TEST PAPER-09

CLASS - XII BIOLOGY (Ecosystem)

1. Name two climatic factors that regulate decomposition? [1]

2. What is sere? [1]

3. Name the primary consumers in aquatic ecosystem? [1]

4. Name the pioneer species in the primary succession on rock? [1]

5. List the factors on which pioneer species depend during secondary succession? [2]

6. The productivity of ecosystem increases from polar regions towards tropics. Why? [2]

7. Mention some of the ecological services provided by forests? [2]

8. Differentiate between food chain & food web? [2]

9. What is pyramid of biomass? Represent the pyramid of biomass in [3]
   i) grassland ecosystem
   ii) aquatic ecosystem.

10. Represent schematically & describe carbon cycle in ecosystem? [5]

CBSE TEST PAPER-09

CLASS - XII BIOLOGY (Ecosystem)

[ANSWERS]

Ans.1. Chemical composition of detritus & climatic factors.

Ans.2. The entire sequence of communities that successively change in a given area resulting in climax community is called sere.

Ans.3. Zoo planktons.

Ans.4. Lichens.

Ans.5. In secondary succession, the type of pioneer species depends on :-

i) Conditions of the soil
ii) Availability of water
iii) Environmental conditions
iv) Seeds or other propagules present.

Ans.6. The productivity of ecosystem increases from polar region towards tropics because of the increasing sunlight & temperature.

Ans.7. i) Forests purify air
ii) They mitigate droughts & floods.
iii) They help in cycling of nutrients.
iv) They provide habitat to number of wild life
v) They maintain biodiversity.

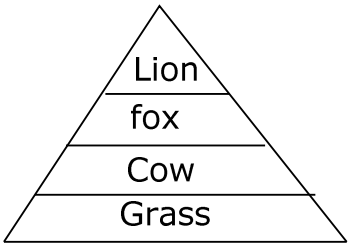
Ans.8. The unidirectional sequence of organisms in which energy flows in the form of food from one organism to another through the process of eating & being eaten is called

food chain whereas the network of interlinked food chains are collectively known as food web.

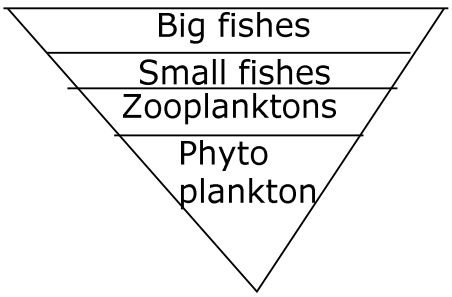
Ans.9. The biomass means the total weight of fry matter pyramid of biomass represents the weight of dry matter at different trophic levels of ecosystem at one time in a food chain of food web.

i) Grassland ecosystem :- In grassland ecosystem, the pyramid of biomass is upright i.e. pyramid of biomass shows gradual reduction in biomass at each trophic level from base to apex.

Grass $\rightarrow$ cow $\rightarrow$ fox $\rightarrow$ Lion



ii) In pond aquatic ecosystem, the biomass of consumers is always greater than biomass of producers hence it occurs as an inverted pyramid



Ans.10. The source of carbon is atmosphere & water. Carbon is present in atmosphere mainly in the form of CO_2. It is vital to the production of carbohydrates through photosynthesis.

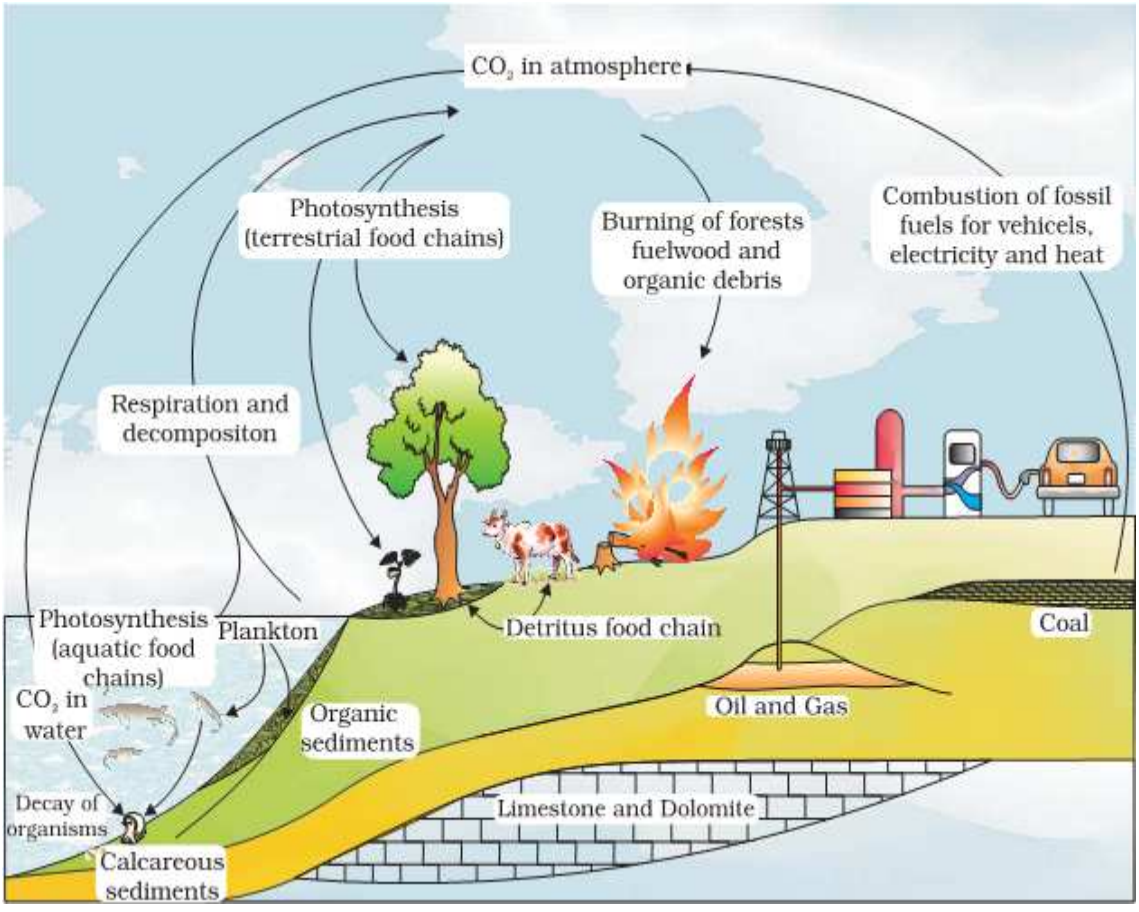
$$6CO_2 + 12\ H_2O \xrightarrow[chlorophyll]{h_2} C_6H_{12}O_6 + 6H_2O + 6O_2 \uparrow$$

In atmosphere, carbon is present in the form of CO_2 from the atmosphere it is incorporated into tissues of green plants e.g. carbohydrates, proteins & lipids.

The CO_2 dissolved in sea water is utilized lay marine animals like protozoans, corals, mollusks etc for their life. In these animals, CO_2 is converted into calcium carbonate which is used for construction of shell.

$$Co_2 + H_{2O} \rightarrow H_2CO_3 \rightarrow HCO_3 \rightarrow CaCO_3 + H^+$$

After death of marine animals, $CaCO_3$ store in shells is either deposited as sedimentary rock or dissolved in water to release CO_2. A certain proportion of carbon is deposited as coal carbon from coal returns to air in the form of CO_2 through combustion & weathering thus, carbon from atmospheric pool moves to green plants, then to animals & finally to bacteria fungi etc. to return it to atmosphere through decomposition-



CBSE TEST PAPER-10

CLASS - XII BIOLOGY (Biodiversity & Conservation)

1. Expand i) IUCN - [1]

   ii) MAB –

2. What are hot spots? [1]

3. Name any two threatened animal species of India? [1]

4. What is IUCN red list? Give any two uses of this list? [2]

5. "Species diversity of plants is much less than that of animals" Why? [2]

6. What is the difference between in-situ & ex-situ conservation? [2]

7. "Amazonian rain forest in south America has the greatest bio-diversity on earth". Justify the statement. [2]

8. What do you mean by biodiversity? What are the different types of Biodiversity? [3]

9. What do you mean by latitudinal gradient? What could be the possible reasons for diversity between tropic & temperate region? [3]

10. Mention the major causes for loss of biodiversity? [3]

CBSE TEST PAPER-10

CLASS - XII BIOLOGY (Biodiversity & Conservation)

[ANSWERS]

Ans.1. i) IUCN – International union of conservation of mature & natural resources
ii) MAB – man & biosphere programme.

Ans.2. Hot spots are the priority areas of conservation that are extremely rich in species have high endemism & under constant threat of extinction

Ans.3. Swamp Deer & Great Indian Rhinoceros

Ans.4. IUCN (International union of conservation of nature & natural resources) maintains a "Red data list" which is a catalogue of taxa facing risk of extinction. The main purpose of this list:-

i) to identify & document the species with high risk of extinction.
ii) to provide awareness to the degree of threat to biodiversity.

Ans.5. The species diversity of plants is much less than that of animals because most animals possesses nervous system that control & coordinate various activities of animals. They also possess receptors to receive environmental stimuli some of these responses are adaptive & ensure survival of organism in changing environmental conditions.

Ans.6.

In-situ conservation	Ex-situ conservation
i) It is the process of protecting the species in its natural habitat by protecting or cleaning up the habitat	i) It is the process of protecting the species lay removing it from unsafe habitat & placing under car.
ii) It helps in recovering population in the surroundings.	ii) It help in recovering population under simulated conditions
iii) eg. National park, Biosphere reserves.	iii) eg. Botanical garden Gene bank.

Ans.7. Amazonian rain forest in south America has the greatest biodiversity on earth; it harbors about 40000 species of plants, 1,25,000 species of insects, 3000 species of fishes, 427 of amphibians, 378 of reptiles, 1300 of birds & 427 of mammals.

Ans.8. Biodiversity can be defined as the totality of genes species & ecosystem of a given region. Three important components of Biodiversity are:-

i) Genetic Biodiversity:- It refers to the diversity of genes within a species, Greater the genetic diversity among organisms of a species. More sustenance it has against environmental perteburations whereas genetically uniform populations are highly prone to diseases or harsh environment.

ii) Species Biodiversity:- It refers to variety of species within a region. It has two important measures :-

a) Species richness:- i.e. number of species per unit area.

b) Species evenness:- i.e. abundance with which each species is represented in an area.

iii) Ecosystem Biodiversity:- It refers to variation of habitats, community types & abiotic environment present in an area. It is further of three types:-

a) α - diversity- It refers to number of species in a given community.

b) β- diversity – biodiversity which appears in range of communities due to replacement of species with change in community is called β- diversity.

c) γ- diversity – It refers to diversity of habitats over the total geographical area.

Ans.9. Latitudinal gradient in diversity means that species diversity usually decreases as we move away from equator towards the poles, Tropic area of latitudinal range 23.5^0c harbor more species than temperate or polar area. Three hypothesis have been proposed to explain this difference:-

i) Speciation is a function of time, which temperate regions were subjected to frequent glaciations in the past, the tropics have remain unchanged & hence evolved more species diversity.

ii) As compared to temperate region, tropical environment are less seasonal, relatively more constant & predictable; such constant environment have promotes niche specialization & greater species diversity.

iii) There is more solar radiation avail able in tropical region this contributes directly to greater productivity & indirectly to greater species diversity.

Ans.10. The four major causes for loss of Biodiversity are :-

i) Habitat loss & fragmentation of crops or conversion into grassland for raising beef-cattle. Total loss of habitat deprives many plants & animals their hone & they face extinction. Similarly when a large Habra becomes fragmented, animals requiring large territory& those with migratory habits are adversely affected.

ii) Over exploitation :- when nature is over-exploited be man for natural resources, many species become extinct.

iii) Invasion of alien species:- The alien species became invasive & compete with native species & cause extinction of indigenous species.

iv) Co-extinction:- Co-extinction is a phenomenon in which when a species become extinct, the plant & animal species associated with it in an obligatory manner & become extinct

CBSE TEST PAPER-11

CLASS - XII BIOLOGY (Biodiversity & Conservation)

1. Name two most biodiversity rich zones of India? [1]

2. Expand : i) – WWF [1]

   ii) - IBWL

3. What is cryopreservation? [1]

4. Sometimes introduction of an exotic species upsets native species of the ecosystem. Substantiate the statement with the help of an example? [2]

5. What do you mean lay species diversity? Name two measures of species diversity? [2]

6. What are sacred grooves? What is their role in conservation? [2]

7. What do you mean by IPR. What are the drawbacks of IPR. [2]

8. Why is it necessary to conserve biodiversity? [3]

9. What is the relation between species richness & area? What is the significance of slope of regression? [3]

10. What are the different approaches for biodiversity conservation in India? [3]

CBSE TEST PAPER-11

CLASS - XII BIOLOGY (Biodiversity & Conservation)

[ANSWERS]

Ans.1. Western Ghats & eastern Himalayas.

Ans.2. i) WWF – World wildlife fund
ii) IBWL – Indian Board of wild life.

Ans.3. Cryopreservation is the storage of materials at ultra – low temperature either by rapid cooling or by grade cooling & simultaneous dehydration at low temp.

Ans.4. The alien species become invasive & compete with native species causing extinction of indigenous species e.g. introduction of African catfish (clarias gariepinus) for aquaculture purposes, is posing threat to our. Indigenous catfish, (clarias bacterachus).

Ans.5. Species diversity refers to the variety of species within a region. The two important measures of specie diversity are:-
i) Species richness:- It refers to number of species per unit area.
ii) Species evenness :- It refers to relative abundance with which each species is represented in an area.

Ans.6. Sacred grooves are sacred forest patches around the places of worship. Tribal people do not allow to cut even a single branch of tree in these sacred grooves due to which many endemic species flourish in these region.

Ans.7 IPR refers to Intellectual property rights, under which transformed plants, animals or microorganisms can be patented & become exclusive private property.
Drawbacks of IPR:-
i) Increase in price of seeds
ii) Greater domination of agriculture by multinational companies.

iii) Slower diffusion of new varieties

iv) Replacement of local varieties by exotic varieties.

Ans.8. The reasons for conserving biodiversity can be grouped into three categories.

i) Narrow utilitarian reasons:- Human beings derive a number of economic benefits like food, fibre, firewood, industrial product & medicinal products.

ii) Broad utilitarian reasons:- Biodiversity plays a major role in providing ecosystem services like :-

a) production of oxygen

b) Pollination of flowers, without which seeds or fruits are not produced.

c) Aesthetic pleasures like bird watching, watching spring flowers, walking through thick forest, working up to bulbul's song etc.

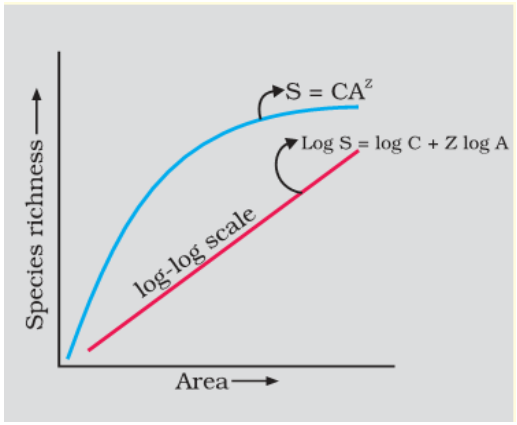
iii) Ethical reasons :- Every species has an intrinsic value even if it is not of any economic value to us-we have a moral duty to care for their well-being & pass on the biological legacy in a proper from to our future generation.

Ans.9. Alexander Von Humboldt has observed that within a region, species richness increased with increase explored area but only upto a limit thus the relationship between species richness & area for a number of taxa is found to be a rectangular hyperbola.

On a log scale, the relation ship becomes linear & is described lay equation

$$\text{Log } S = \log C + Z \log A$$

The values of slope of regression are identical regardless of the taxonomic group or the region. When such analysis is made among very large areas, the slope of regression would be much steeper.



Ans.10. There are two major approaches for conservation of biodiversity:-

i) In-situ conservation :- It is the process of protecting the endangered species of plant or animal in the natural habitat lay either protecting or cleaning up the habitat or by defending species from predators It includes:-

a) Biosphere Reserves:- There are 425 biosphere reserve in the world of which 14 are in India. Hotspots have been identified for maximum protection to endemic or endangered species.

b) National park or wildlife Sanctuaries:- India has about 90 national parks & 448 wildlife sanctuaries.

c) Sacred forests:- These are undisturbed forests without any human intervention & are surrounded by highly degraded landscapes.

ii) Ex- situ Conservation:- It is the process of protecting the endangered species of plants or animals by removing it from threatened habitat & placing them under care of humans. It includes :-

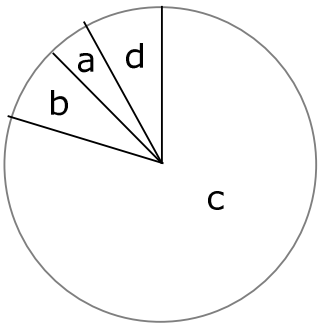
a) Botanical garden, zoological park and arboreta are conventional methods of ex-situ conservation

b) Cryopreservation to the storage of materials at ultra low temperature either by rapid cooling or by gradual cooling & simultaneous dehydration at low temperature.

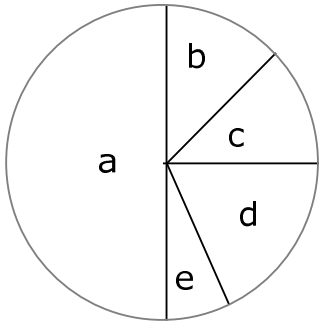
CBSE TEST PAPER-12

CLASS - XII BIOLOGY (Biodiversity & Its Conservation)

1. Write the scientific name of the plant that yields reserpine? [1]
2. Name any two conventional methods of ex-situ conservation? [1]
3. What do you mean by "vulnerable species"? [1]
4. Name the national park for Rhinoceros & lion in India respectively? [1]
5. Which type of conservation measures – in situ or ex-situ will help the larger number of species to survive? Explain. [2]
6. What is Biodiversity? Why has it become important recently? [2]
7. List the important attributes of a stable community? [2]
8. Given below are the representation of global diversity of invertebrates & vertebrates. [2]



Invertebrates



Vertebrates

Mention the class of organism which belongs to each group in this representation.

9. Give reason why is it difficult to estimate global diversity for prokaryotes? [2]
10. Give an account of Biodiversity in India? [3]
11. What is the significance of Biodiversity to Human beings? [3]

CBSE TEST PAPER-12

CLASS - XII BIOLOGY (Biodiversity & Its Conservation)

[ANSWERS]

Ans 1. Rauwolfia serpentina.

Ans 2. Botanical garden & zoological parks.

Ans 3. Species that are believed to move into endangered species category in the near future if the causal factors continue operating are called vulnerable species.

Ans 4. Kaziranga national park & Gir National Park respectively.

Ans 5. In-situ conservation will help the larger number of species to survive because it provides natural environment for growth & development of species.

Ans 6. Biodiversity means the variability among living organisms from all sources including interalia terrestrial, marine & other aquatic ecosystem & ecological complexes of which, they are parts, this includes diversity within species, between species & of ecosystem. In modern times, industrialization civilization, urbanization has developed to large scale use of different species of plants & animal as a result of which life of several species of organism has been endangered thus, Biodiversity has become so important in recent times.

Ans 7. i) It shall not show too much of variations in the year – to – year productivity.
ii) It must be either resistant or resilient to seasonal disturbances.
iii) It must be resistant to invasion by alien species.

Ans 8.

	Invertebrates		Vertebrates
a-	Crustaceans	a-	Fishes
b-	Molluscs	b-	Mammals
c-	Insects	c-	Birds
d-	Other animal groups	d-	Reptiles
		e-	Amphibians

Ans 9. It is difficult to estimate climate diversity of prokaryotes because :-

i) Conventional taxonomic methods are not suitable for identifying microbial species.

ii) Many of these species cannot be cultured under laboratory conditions.

iii) Biochemical & molecular biology techniques would put their diversity into millions.

Ans 10. India is one of the 10th mega biodiversity countries of the world because of the presence of variety of climatic conditions prevailing on different ecological habitat ranging from tropical, subtropical, temperate, So far as biodiversity of India is concerned, it comprises about 47,000 plants & 81,000 animal species. India occupies 2-4% of total land area of would but in terms of biodiversity, India contribute about 10-35% of global diversity.

A large number of species is native of India. About 5000 species of flowering plants belonging to 141 genera & 47 families had a birth in India. There are 62% of amphibian species & 50% of lizards endemic to our country with large number in Western Ghats. India is an origin place of 166 species of crop plants & 320 species of wild relatives of cultivated crop. India is rich in marine biodiversity lying along coastline of 7500 km. There are two hotspots located in India out of 25 in would – These are Western Ghats & Eastern Himalayas.

Ans 11. Biodiversity provide numerous direct or indirect services to human beings. These are -

i) Source of food & improved varieties:- Biodiversity directly or indirectly adds as the source of food, cloth & shelter.

ii) Fats & Oils:- A variety of plants are used to extract different kinds of oils.

iii) Fibres:- A variety of plants eg. cotton, hemp, jute are chief sources of fibres.

iv) Resins:- Resins are sticky exudation of plants.

v) Gums, Timber, Paper, Tannins, Dyes:- Plants species provide variety of useful products eg. gums, raisins, dyes, similarly animal species provide leather, fur, honey, silk, pearl etc.

vi) Drugs & Medicines:- Hiving organism also contain number of therapeutically useful substances.

vii) Stability of Ecosystem:- The food web, food chain energy flow in various tropic level & biochemical cycles occurs in natural ways without any hindrance if there is proper availability of diversified species

viii) Aesthetic, Scientific & Recreational values :- Indian people grow many plants because they regard them as sacred.

CBSE TEST PAPER-13

CLASS - XII BIOLOGY (Environmental Issues)

1. Name any three gases contributing to green-house effect. [1]
2. Name any two metals found in the catalytic converts? [1]
3. What is meant by ozone hole? [1]
4. What are algal blooms? How do they affect the other organisms in the water body? [2]
5. How do CFCS cause damage to ozone layer? [2]
6. What initiatives were taken for reducing vehicular are pollution in Delhi? [2]
7. What is biological magnification? Explain how DDT as a water pollutant undergoes biological magnification? [3]
8. Discuss briefly the catalytic converter? [3]
9. i) What is meant by ozone shield? [5]
   ii) Name two ozone depleting substances?
   iii) How do ozone depleting substances affect ozone shield?
   iv) Write one damaging effect of ozone – depletion on human & plants respectively?

CBSE TEST PAPER-13

CLASS - XII BIOLOGY (Environmental Issues)

[ANSWERS]

Ans 1. Carbon dioxide, methane & chlorofluorocarbons.

Ans 2. Platinum, rhodium.

Ans 3. The decline in this thickness of spring time ozone layer is called ozone hole.

Ans 4. The excess proliferation of planktonic algae imparting distinct to the water is called algal bloom Algal bloom in turn causes deterioration in water quality, fish mortality, & secretion of chemicals that are highly toxic to human & other animals.

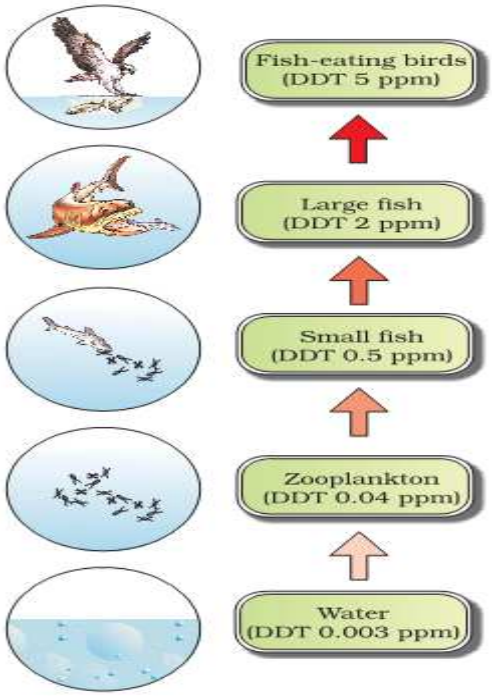
Ans 5. Chlorofluorocarbon (CFCS) breaks into active chlorine in the presence of uv. The Cl atom degrade ozone into molecular oxygen which causes depletion of ozone layer.

Ans 6. In Delhi, the following initiatives have been taken for reducing vehicular air pollution:-

i) Use of unleaded petrol.
ii) Use of low sculpture petrol & diesel.
iii) Use of catalytic converters in vehicles.
iv) Use of Euro – II grade engines in vehicles.
v) Use of CNG in place of diesel in buses & autos.

Ans 7. Insecticide & herbicide are very harmful; they destroy the larval stage of aquatic animals. These substances also reduce the photosynthetic activity of phytoplankton & algae.

Through the food chain, there accumulate in the body of carnivores in more high concentration & produce fatal effects, so large number of fishes are found dead in areas polluted with DDT shows the biological magnification or bio-concentration of DDT through an aquatic food chain



Thus, Biological magnification is the phenomenon in which harmful chemicals/pollutants get accumulated in the tissues of organisms in increasing concentration, as they travel along the food chain.

Ans 8. Catalytic converters are used in automobiles for reducing of harmful gases. They have expensive metals like platinum, palladium, rhodium as catalysts. As the exhaust passes through catalytic converter, unburnt hydro-carbons are converted into carbon-dioxide & water; carbon monoxide & nitric oxide are changed into carbon dioxide & nitrogen gas respectively. Vehicles fitted with catalytic converter should use unleaded petrol as leaded petrol inactivates the catalyst.

Ans 9. i) The ozone layer present in the atmosphere acts as an ultraviolet absorbent thus protecting the earth from its harmful effect. The upper layer of atmosphere enveloped lay ozone is called ozone layer or ozone shield.

ii) Chlorofluorocarbon used in aerosol propellant, fire extinguisher, refrigeration etc.

iii) During depletion, the chlorine, fluorine, bromine, of CFCS & halogens are converted into reactive free radical form lay photochemical reaction Cl or F are free to react with ozone disintegrating it into $O_2 + O$

$$CF_2Cl_2 \rightarrow CF_2Cl + Cl$$

$$Cl + O_3 \rightarrow ClO + O_2$$

iv) In humans, it causes damage to DNA & mutations arise & also cause ageing of skin, damage to skin & skin cancer.
In plants, it causes injury, premature death of plants & reduced growth & yield.

CBSE TEST PAPER-14

CLASS - XII BIOLOGY (Environmental Issues)

1. Define polar Vortex? [1]

2. Name the method used to remove pollutant gases from exhaust? [1]

3. Why CNG is considered a better fuel than diesel for automobiles? [1]

4. What are e-wastes? How can they be getting rid off? [2]

5. Mention any four consequences of deforestation? [2]

6. Why are the radioactive wastes stored in small power within the premises of nuclear power plant before they are finally disposed? [2]

7. Why do certain organisms that disappear after a certain distance in water body? [2]

8. With the help of a diagram describe the working of an electrostatic precipitator? [3]

9. What is deforestation? Mention some of its causes & also the measures taken to prevent deforestation? [3]

10. What is Green house effect? Discuss the various impacts of greenhouse effect on environment? [3]

CBSE TEST PAPER-14

CLASS - XII BIOLOGY (Environmental Issues)

[ANSWERS]

Ans 1. Polar vortex refers to the natural circulation of wind that completely isolates the Antarctic air from rest of world.

Ans 2. Scrubber.

Ans 3. Because CNG is a renewable fuel & makes less pollution.

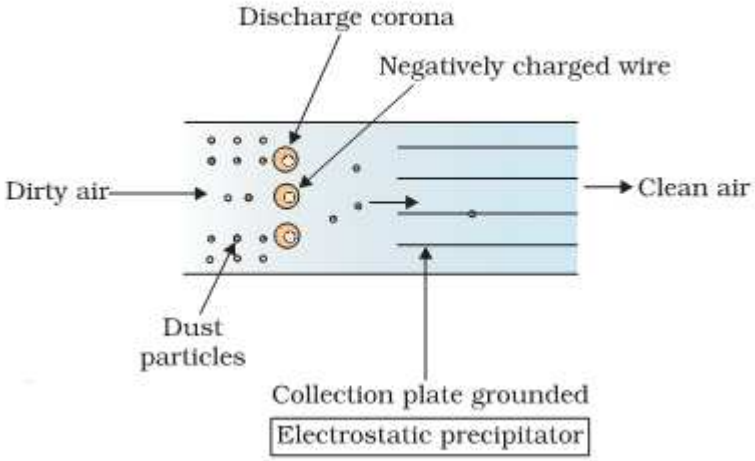
Ans 4. E-wastes are damaged electronic item or electronic parts. These are generated in developed countries & are sent to developing countries where certain metals like gold, nickel silicon, copper etc. are recovered from them e-wastes are buried as landfill or incinerated.

Ans 5. i) Carbon dioxide concentration of the atmosphere has increased.
ii) There is a loss of biodiversity due to habitat destruction.
iii) Deforestation disturbs hydrological cycle.
iv) There is soil erosion & it may lead to desertification in extreme cases.

Ans 6. Radioactive wastes are first concentrated to reduce the volume & then for 50-100 years in small ponds within the premises of nuclear power plants during which time there is considerable decay of radioactivity & lessening of heat. Subsequently they are stored in suitably containers & buried within rocks about 500m deep inside the earth.

Ans 7. Since domestic sewage mainly contains biodegradable wastes they are decomposed by microorganisms; the decomposer use oxygen of the water body & hence many aquatic organism die due to lack of oxygen but after a certain distance in water body where nutrient availability is more certain microorganisms reappears.

Ans 8. It is the most widely used method for removal of particulate matter. About 99% of particulate matter is removed from exhaust of thermal power plant. It has electrode urines & a stage of collecting plates. The collecting cures are maintained at several thousand volts which produces corona that releases electrons. These electrons get attached to dust particle & give them a net negative charge. These charged particles are attracted by collecting plates. The velocity of air must be low enough to allow particles to fall on them.



Ans 9. The cutting down of forests to fulfill demands of ever increasing population is known as deforestation. The major causes of deforestation include:-

i) Indiscriminate felling :- Overuse of forest resources by cutting trees to fulfill demand of fuel wood, household articles.

ii) Overgazing :- by wild as well as domestic animals due to which soil is exposed to direct action of wind, water, sun.

iii) Conversion of forest area into industrial area:- acc, to population, man is trying to convert forest land into cultivable land to meet his demand.

iv) Shifting Cultivation:- due to continuous & repeated cropping the become unsuitable for cultivation.

v) Developmental projects:- e.g. dams, buildings, hydroelectric projects, railway lines, roads etc.

Forests can be conserved by any of the following ways:-

a) Afforestation & reforestation.

b) Protection from fire

c) Protection from grazing

d) Protection from insects & pests

e) Protection from human interference.

Ans 10. Under normal conditions & concentration of CO_2, the temperature of earth surface is maintained by energy balance of sun that strike the planet & heat is radiated back into outer space. However, when concentration of CO_2 in atmosphere increases, it prevents the heat from being re-radiated out. The heated earth can re-radiate this absorbed energy as the radiations of longer wavelength. This sort of phenomena known as Green house effect impact of Green house effect:-

i) Change in weather & climatic condition :- The mean temperature of earth has increased by 0.6^0 c during last century. When environment heats up, its moisture carrying capacity increases. It will result in drastic changes in rainfall pattern. As a result , floods & drought increases thereby causing health hazards.

ii) Rise in Sea level:- The gradual increase in green house effect will lead to serious consequences e.g. melting of glaciers & polar ice-caps.

iii) Decrease in forest cover:- The drastic decrease in forest cover will create a layer of impenetrable gases on the surface of earth atmosphere converting planet into blast furnace.

iv) Effect on Agriculture :- The changes of depletion of character & productivity of soil is associated with global warming.

CBSE TEST PAPER-15

CLASS - XII BIOLOGY (Environmental Issues)

1. Which types of uv-radiations are lethal to organisms? [1]

2. What is meant by snow blindness? [1]

3. Why should unleaded petrol be used in automobiles with catalytic converter? [1]

4. Name the most widely used method of removing particulate matter? [1]

5. What is the expected rise din the global temperature by the year 2010? [1]

6. What is photochemical smog composed of? How does this affect the plants? [2]

7. What can be the effect of discharging hot water into water body on the organism in it? [2]

8. How defunct ships do contributes to solid wastes? [2]

9. What is Eutrophication? Explain its consequences on the life of plants & animals living in such water? [3]

10. Describe the different components that compose solid wastes? [3]

11. Discuss the various effects of Deforestation? [3]

CBSE TEST PAPER-15

CLASS - XII BIOLOGY (Environmental Issues)

[ANSWERS]

Ans 1. UV-B

Ans 2. The inflammation of cornea caused by a high dose of UV-B is known as snow blindness.

Ans 3. Unleaded petrol is used in automobiles with catalytic converter because lead may deactivate the catalyst present in converter.

Ans 4. Electrostatic precipitator.

Ans 5. Global temperature may increase by 1.4-5.8^{0}c by 2010.

Ans 6. Combustion of petrol & diesel releases carbon monoxide nitrogen oxide, hydrocarbons etc. Many of the products of incomplete combustion of petrol & diesel undergo photochemical reaction with oxides of nitrogen to generate photochemical smog. It causes toxic effects on plants e.g. premature death, reduced growth and yield.

Ans 7. Thermal waste water flowing out from thermal power plants eliminates or reduces many organisms that are sensitive to high temperature but it may enhance the growth of plants & fish in extremely cold areas.

Ans 8. Defunct ships contributes to solid wastes. In India & other developing countries, these ships are broken down for scrap metal. The body of these ships contains toxic materials lake asbestos, tributyltin, mercury, lead, etc. These chemicals are very harmful for worker. It also pollutes coastal areas in vicinity of ship breaking yard.

Ans 9. Eutrophication means natural ageing of lake by nutrient enrichment of its water. In a young lake water is cold & clear, supporting little life. With time streams draining into lake introduce nutrients e.g. nitrogen, phosphorus, which encourage the growth of aquatic organism. As the lake fertility increases, plant & animal life burgeons & organic remains begin to deposit on bottom of lake. Over centuries, as silt & organic debris pile

up, lake grows shallower & warmer with warm water supplanting those thrive in cold environment Marsh plants take root in the shallows & begin to fill in original lake basin. Eventually, lake gives rise to large masses of floating plants finally converting into land. However, pollutants from man's activities can radically accelerate the ageing process. This phenomena has been called cultural or accelerated eutrophication.

Ans 10. Solid wastes refers to everything that goes out in trash. They are of following types:-

i) Municipal solid wastes:- wastes from homes, offices, schools etc, that are collected & disposed by the municipality & generally consist of paper, waste, food material, leather etc.

ii) Fly ash:- Thermal power plants generate flyash which is composed of oxides of silica, iron & aluminium & low conc. of toxic heavy metals.

iii) Defunct ships:- Defunct ships are broken down in developing countries for scrap metals, they contain toxic substances like asbestos, PCB, lead, mercury etc.

iv) Hospital wastes:- Hospital produces many hazardous wastes that contains pathogenic microbes, disinfectant & other harmful chemicals.

v) Industrial wastes:- Industries involved in manufacture of paper, rubber, pesticide, dye etc produce large amount of corrosive & highly inflammable chemicals

vi) Electronic wastes:- E-wastes are generated in developed countries & sent in developing countries where certain metals like Au, Ni, Si, Cu, Fe etc. are recovered from them but also produces toxic substances.

Ans 11. i) Destruction of Resources:- destruction of forests leads to decrease in availability of forest resources e.g. timber, firewood etc.

ii) Soil erosion:- The destruction of green cover results in loosening of soil & large scale erosion so agricultural production goes down.

iii) Heavy Siltation of Dams:- Large scale deforestation leads to increasing disastrous floods & soil erosion.

iv) Destruction of wildlife:- Deforestation destroys the habitat of animal species resulting depletion in wildlife & their gradual extinction.

v) Change in Microclimate:- destruction of forests decrease the availability of ground water resources & also result in decrease in average rainfall in a particular area.

vi) Desertification:- Destruction of forests & overgrazing of animals leads to formation of deserts.

vii) Environmental pollution:- CO_2 produced by burning of fossil fuels is used up to large extent by plants for photosynthesis.