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ST. LAWRENCE HIGH SCHOOL

FOR GOD AND COUNTRY

A JESUIT CHRISTIAN MINORITY INSTITUTION

PRE-TEST EXAMINATION- 2019

Sub: BIOLOGICAL SCIENCE **Class: XII** **F.M: 70**

Duration: 3 hours 15 Minutes **Date: 09.08.2019**

SECTION –I

1. Choose the correct answer: **1x14=14**

i) Which of the following is not asexual reproductive structures?
- (1) Conidia
- (2) Buds
- (3) Gemmules
- **(4) Zygospore**

ii) Pollen grains are shed at _____ celled stage?
- (1) 1
- **(2) 2**
- (3) 3
- (4) 4

iii) Funnel shaped portion of the ovary is called
- **(1) Infundibulum**
- (2) Fimbriae
- (3) Ampulla
- (4) Ishthmus

iv) Which of the following are not male accessory glands?
- (1) Seminal Vesicles
- (2) Prostrate
- (3) Bulbourethral Gland
- **(4) Parotid**

v) Primary oocyte is formed at the
- **(1) Fetal stage**
- (2) Childhood
- (3) Puberty
- (4) Adult reproductive life

vi) Which of the following hormones are not produced by placenta?
- (1) hCG
- (2) hPL
- (3) Progesterone
- **(4) Relaxin**

vii) In RNA ,-OH group is present at _____ position
- **(1) 2'**
- (2) 3'
- (3) 4'
- (4) 5'

viii) In capping, the foolowing is used
- **(1) Methyl guanosine triphosphate**
- (2) Methyl adenosine triphosphate

(3) Ethyl guanosine triphosphate
(4) Ethyl adenosine triphosphate

ix) RNA Polymerase II transcribes
(1) tRNA
(2) srRNA
(3) snRNA
(4) hnRNA

x) Which of the following is a start codon?
(1) AUG
(2) AUU
(3) UAU
(4) UAA

xi) Thorns of Bougainvillea and tendrils of cucurbita are
(1) Homologous
(2) Analogous
(3) Both
(4) None of these

xii) Cellular oncogenes are represented as
(1) c-onc
(2) l-onc
(3) r-onc
(4) s-onc

xiii) Which insect pests affect *Brassica*?
(1) Aphids
(2) Jassids
(3) Fruit borer
(4) Shoot borer

xiv) Colostrum is an example of
(1) Active immunity
(2) Passive immunity
(3) Both
(4) None of these

SECTION-II

GROUP –A

Answer the following questions:- **1x4=4**

1. What do you mean by 'emasculation'?
The removal of flower buds before the anther dehisces using a pair of forceps is called emasculation.

2. What is 'perisperm'?
Nutritive tissue of a seed derived from the nucellus and deposited external to the embryo sac.

Or

What is 'polyembryony'?
The phenomenon of the development of more than one embryo in one ovule, seed or fertilized ovum is called polyembryony. It occurs in both animals as well as plants. In several gymnosperms, the polyembryony is so common that it might be regarded as an important character of this group.

3. What is the function of bulbourethral glands?
Bulbourethral gland, also called Cowper's Gland, either of two pea-shaped glands in the male, located beneath the prostate gland at the beginning of the internal portion of the penis; they add fluids to semen during the process of ejaculation

Or

What is GIFT?

Gamete intrafallopian transfer (GIFT) is a tool of assisted reproductive technology against infertility. Eggs are removed from a woman's ovaries, and placed in one of the Fallopian tubes, along with the man's sperm.

4. What are albuminous seeds?

Albuminous seeds are the seeds which have food stored in the special nourishing tissue called as endosperm that remains persistent till maturity. e.g. Castor seed.

GROUP-B

Answer the following questions:- **2x5=10**

5. What is placenta? What is its function?

The placenta is a large organ that develops during pregnancy. It is attached to the wall of the uterus, usually at the top or side. The umbilical cord connects the placenta to your baby.
Blood from the mother passes through the placenta, filtering oxygen, glucose and other nutrients to your baby via the umbilical cord. The placenta also filters out substances that could be harmful to your baby and removes carbon dioxide and waste products from your baby's blood.

6. Name two STDs caused by bacteria. Write any one symptom of each.

Gonorrhoea,syphilis,Chlamydiasis.
Gonorrhoea:In men ,Discharge from the penis-white and yellow.In women,Discharge from the vagina,Anal irritation
Syphilis:Firm sore in and out of vagina,penis,anus,mouth.Patchy hair loss,swollen lymph glands.

7. What is test cross? What is its importance?

It is a type of cross between a tall plant or organism showing dominant phenotype with the dwarf pea plant or recessive organism instead of self crossing,where Mendel has crossed a tall plant (TT/Tt) with a dwarf pea plant (tt).

The test cross is of great significance with the help of which the genotype of the dominant organism can be determined whether a pure tall plant having genotype (TT) or hybrid tall (Tt)

Or

State the Law of Dominance. How is it significant in monohybrid cross?

The law of Dominance states that:
i.Characters are controlled by discrete units called factors.
ii.Factors occur in pairs.
iii.In a dissimilar pair of factors one member of the pair dominates (dominant)the other(recessive).

The Law of Dominance is used to explain the expression of only one of the parental characters in a monohybrid cross in the F_1 generation & the expression of both in the the F_2 generation .It also explains the proportion of 3:1 obtained at the F_2.

8. Describe the type of sex determination in grasshoppers?

Grasshopper is an example of XO type of sex determination in which the males have only one X chromosome besides the autosomes, whereas females have a pair of X- chromosome.Mles produce two types of gametes ,heterogametic sex & females produce same type of gametes –homogametic sex.

Or

What is the cause of phenylketonuria?

Phenylalanine hydroxylase is an enzyme that catalyzes the hydroxylation of the of phenylalanine to generate tyrosine. The affected individual lacks this enzyme ,as a result of which Phenylalanine gets accumulated & is converted into phenylpyruvic acid ,accumulation of which in the brain results in mental retardation & also excreted though urine because of its poor absorption by kidney.

9. Write any two salient features of genetic code.

- *The codon is a triplet ,61 codons code for amino acids & 3 codons do not code for any aminop acids,and they function as stop codons.*
- *Some amino acids are coded by more than one codon ,hence the code is degenerate.*
- *The codon is read in mRNA in a contiguous fashion.There are no punctuations.*
- *AUG has dual functions.It codes for Methionine (met)& it acts as an initiator codon.*

Or

Describe the structure of tRNA.

Transfer ribonucleic acid (tRNA) is a type of RNA molecule that helps decode a messenger RNA (mRNA) sequence into a protein. The tRNA molecule has a distinctive folded structure with three hairpin loops that form the shape of a three-leafed clover. One of these hairpin loops contains a sequence called the anticodon, which can recognize and decode an mRNA codon. Each tRNA has its corresponding amino acid attached to its end. When a tRNA recognizes and binds to its corresponding codon in the ribosome, the tRNA transfers the appropriate amino acid to the end of the growing amino acid chain. Then the tRNAs and ribosome continue to decode the mRNA molecule until the entire sequence is translated into a protein.

GROUP – C

Answer the following questions:- **3x9= 27**

10. Describe the process of microsporogenesis. (3)

As the anther develops ,the cells of the sporogenous tissue undergo meiotic division to form microspore tetrads.As each cell of the sporogenous tissue is capable of giving rise to a microspore tetrad .Each one is a potential pollen or microspore mother cell .The process of formation of microspores from a pollen mother cell (PMC)through meiosis is misporogenesis.The microspore as they are formed are arranged in a cluster of four cells-the microspore tetrad.As the anthers mature & dehydrate the microspores dissociate from each other & develop into pollen grains.

Or

Describe the structure of a matured embryo sac. (3)

Embryo sac The female gametophyte (an oval structure in the nucellus of the ovule) of flowering plants, formed by the division of the haploid megaspore nucleus, and the site of fertilization of the egg and development of the embryo. It consists of 6 haploid cells without cell walls (2 synergidae, 3 antipodal cells, and an egg cell) and 2 haploid nuclei (polar nuclei). Sometimes the 2 haploid, polar nuclei fuse to form a single, endosperm moter cell. At fertilization, 1 male nucleus fuses with the egg nucleus to form a zygote which develops into the embryo. The second male nucleus fuses with the primary endosperm nucleus to form the endosperm nucleus. This then divides to form the endosperm.

11. What is 'inbreeding depression'? How do the plants prevent 'inbreeding depression'? (1+2)

When between is between animals of the same breed it is called inbreeding.Inbreeding increases homozygosity.Inbreeding exposes harmful recessive genes that are eliminated by selection.It also helps in accumulation of superior genes & elimination of less desirable genes.This approach increases the productivity.Continued inbreeding reduces fertility & productivity which is called inbreeding depression.

12. What is LH Surge ? What is its importance? (2+1)

LH stimulates the follicle to manufacture and secrete estrogen. When the amount of estrogen produced in your body reaches a certain level, it causes the pituitary gland to release a surge of LH. Both LH &FSH attain a peak level in the middle of cycle (about 14th day).

Rapid secretion of LH leading to its maximum level during the mid-cycle called LH surge induces rupture of the Graafian follicle & causes ovulation.

Or

Describe the process of development of zygote till its implantation. (3)

The mitotic division starts as the zygote moves through the isthmus of the oviduct called cleavage towards the uterus.& forms 2,4,8,16 daughter cells called blastomeres.The embryo with 8-16 blastomeres is called a morula.The morula continues to divide & transforms into blastocyst & moves further into the uterus.The blastomeres in he blastocyst are arranged into an outer layer called trophoblast and inner layer called the inner cell mass, the former layer gets attached to the endometrium and the latter gets differentiated as the embryo,thus the blastyocyst gets attached to the uterus called implantation.

13. What are IUDs? Write their mode of action and one disadvantage. (1+2)

IUDs are Intra Uterine Devices which are inserted by doctors or nurses in the uterus through the vagina.

Mode of Action: They increase the Phagocytosis of sperms within the uterus & the Cu ions released suppress sperm motility & the fertilizing capacity of sperms.The hormone releasing IUDs make the uterus unsuitable for implantation & the cervix hostile to the sperm.

Advantage: IUDs are ideal contraceptives for the females who want to delay pregnancy & /or space children. It is one of the most accepted methods of contraception in India.

Or

What is 'lactational amenorrhoea'? (3)

Lactational amenorrhoea is the absence of menstruation & is basd on the fact that ovulation & the cycle do not occur during the period of intense lactation following parturition.As long as the the mother breast feeds the child fully ,chances of conceptio are almost nil.This is effective only upto a maximum period of six monthsfollowing parturition.

14. Describe the co-dominance with reference to ABO bloopd grouping. (3)

It is a genetical phenomenon where boh the alleles of a trait in a heterozygote are fully expressed.

In ABO blood group , two alleles of the I gene , which determines ABO blood type, are codominant. Both A and B alleles are dominant over O. As a result, individuals who have an AO genotype will have an A phenotype. People who are type O have OO genotypes. In other words, they inherited a recessive O allele from both parents. The A and B alleles are codominant. Therefore, if an A is inherited from one parent and a B from the other, the phenotype will be AB. Agglutination tests will show that these individuals have the characteristics of both type A and type B blood.

Phenotype	Genotype
O	ii
A	I^AI^A or I^Ai
B	I^BI^B or I^Bi
AB	I^AI^B

Or

What is the cause and symptoms of Klinefelter's syndrome. (1+2)

Two symptoms of Klinefelter's syndrome are:

a) Tall stature b) High pitch voice c) presence of gynacomastia d)sub-fertile to sterile in nature e)Presence of Barr body in somatic cells f) May be with undescended testis g)sparse hair in bears and moustache

It is developed in an aneuploid condition when a person has two X chromosomes and one Y chromosome.the karyotype is XXY and has 47 chromosomes.

15. Describe Griffith's experiment of transforming principle. (3)

Griffith used two strains of Pneumococcus bacteria, type III-S and type II-R.

There is one major difference between these two types; the III-S strain has a smooth polysaccharide coat which makes it resistant to the immune system of mice, whereas the II-R strain lacks this coat and so will be destroyed by the immune system of the host.
Griffith injected both S and R strains to mice. The one which was infected with the S strain developed pneumonia and died while that infected with the R strain stayed alive.
In the second stage, Griffith heat-killed the S strain bacteria and injected into mice, but the mice stayed alive. Then, he mixed the heat-killed S and live R strains. This mixture was injected into mice and they died. In addition, he found living S strain bacteria in dead mice. Griffith concluded that the type II-R had been "transformed" into the lethal III-S strain by a "transforming principle" that was somehow part of the dead III-S strain bacteria.

16. What is adaptive radiation? Provide a suitable example to support this process. (1+2)

According to Darwin's Theory of Evolution, living organisms change their physical and anatomical structure over a long period of time for better adaptations to the changing environment. The initiation of the point of evolution was when organisms wanted to exploit a niche and they were not able to do so with their existing body design or structural component. Organisms started to split and adopt various versions for better survival.
Adaptive radiation is the evolutionary process by which many species originate from one species in an area and radiate to different areas.
Examples of Adaptive Radiation:
1.This phenomenon was first observed by Darwin when he traveled to a place called the Galapagos Island. There he observed that there were finches with different types of beaks. So, he concluded that all of these inches radiated on the same island from a single ancestor Finch. All of these finches developed beaks according to the kind of food available to them. Hence, they evolved from the conventional seed-eating finches to vegetarian and insectivorous finches. They later came to be known as Darwin's finches.
2.Adaptive radiation explains the reason for biodiversity. The concept of adaptive radiation could be simplified through the following example. Consider a family consisting of four children. They have the same parents and origin, grew under the same circumstances and moved to different regions for a better opportunity. Now each one of them has their own adaptation according to their lifestyle and place they stay. Here the lineage splits and radiates different characteristics.
3. Another example for the adaptive radiation is the development of different Australian Marsupials from a single ancestral stock in the Australian subcontinent. This explains divergent evolution for the ancestral stock from which a number of species arise. But, if in a given geographical area, several adaptive radiations take place for various species, it gives rise to convergent evolution.

Or

Why are analogous organs said to be a result of convergent evolution? Give examples of analogous structures. (2+1)

Analogous organs are different in basic structure but perform same functions. They develop in unrelated organisms.
Convergent evolution is the process in which organisms that are not closely related independently evolve similar features. Adaptions may take the form of similar body forms, colors, organs and other adaptions which make up the organism's phenotype.
Convergent evolution creates analogous structures or 'homoplasies', those which have similar forms or functions between diverged species, but were not present in the common ancestor of the two. On the other hand, homologous structures, i.e., a specific organ or bone which appears throughout many different organisms, t often in a slightly different form or shape, can indicate a divergence from a common ancestor.
Examples- Wings of birds and bats look similar. But in birds wings are covered by feathers all along the arm but the wings of bats is skin folds stretched between elongated fingers.

17. Differentiate between ascariasis and filariasis with regard to their cause and symptoms. Name the causal organism for common cold. (2+1)

Filariasis is a parasitic disease caused by an infection with roundworms Lymphatic filariasis is caused by the worms Wuchereria bancrofti, Brugia malayi, and Brugia timori. It affects mainly the lower extremities, while the ears, mucous membranes, and amputation stumps are affected less frequently. However, different species of

filarial worms tend to affect different parts of the body; Wuchereria bancrofti can affect the legs, arms, vulva, breasts, and scrotum (causing hydrocele formation), while Brugia timori rarely affects the genitals.

Ascariasis is a disease caused by the parasitic roundworm Ascaris lumbricoides The worms can occasionally cause intestinal blockage when large numbers get tangled into a bolus or they may migrate from the small intestine Bowel obstruction may occur.A worm may block the ampulla of Vater, or go into the main pancreatic duct, resulting in acute pancreatitis with raised serum levels of amylase and lipase.

Common cold is caused by Rhino virus.

Or

Differentiate between benign and malignant tumour. What is contact inhibition? (2+1)

Benign tumors	Malignant tumor
Slowly growing mass	Rapidly growing mass
Regular surface, capsulated, not attached to deep structures	Irregular surfaces, Non-capsulated attached to deep structures
Noninvasive to another organ or tissues	Invasive to other organs
No spread or metastasis	Spread and metastasis
Well differentiated all the them	Poorly differentiated, moderately or well differentiated
No recurrence after surgery	Recurrence after surgery
No bleeding in cut surfaces	Bleeding from cut surfaces is common
Named by adding suffix –oma	Named by adding suffix sarcoma or carcinoma
Slight pressure effect on the neighboring organ	Remarkable pressure effect on neighboring tissue

Inhibition of cell division and cell motility in normal animal cells when in close contact with each other is called contact inhibition.

18. What is out crossing? Describe the process of artificial insemination . (2+1)

The interbreeding of individuals or stocks that are relatively unrelated (as to improve expression of a desired genetic trait). This is the practice of introducing unrelated genetic material into a breeding line. It increases genetic diversity, thus reducing the probability of an individual being subject to disease or genetic abnormalities.The offspring is known as an out-cross and a single outcrosss helps to overcome inbreeding depression.

Artificial insemination is the deliberate introduction of sperm into a female's cervix or uterine cavity for the purpose of achieving a pregnancy through in vivo fertilization by means other than sexual intercourse. The semen is collected from the male that is injected into the reproductive tract of the selected female by the breeder. The semen may be used immediately or can be frozen and used at a later date.

Or

What are the important points for successful bee-keeping?(any three) (3)

- *Knowledge of the nature and habit of bees*
- *Selection of suitable location for keeping the beehives*
- *Catchig and hiving of swarms*
- *Management of beehives during different seasons*
- *Handling and Collection of honey and beeswax.*

GROUP- D

Answer the following questions:- **5x3=15**

19. What are the steps of plant breeding?What is mutation breeding? (4+1)

Plant breeding is the process in which two genetically dissimilar varieties are purposely crossed to produce a new hybrid variety. As a result, characteristics from both parents can be obtained in the hybrid plant variety. Thus, it

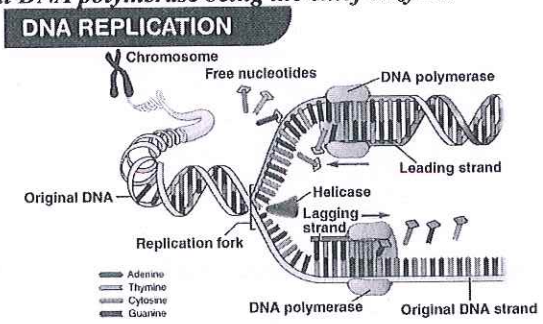
involves the production of a new variety with the desired characteristics such as resistance to diseases, climatic adaptability, and better productivity. The various steps involved in plant breeding are as follows:
(a). Collection of genetic variability: Genetic variability from various wild relatives of the cultivated species are collected to maintain the genetic diversity of a species. The entire collection of the diverse alleles of a gene in a crop is called the germplasm collection.
(b). Evaluation of germplasm and selection of parents: The germplasm collected is then evaluated for the desirable genes. The selected plants with the desired genes are then used as parents in plant breeding experiments and are multiplied by the process of hybridization.
(c). Cross-hybridization between selected parents: The next step in plant breeding is to combine the desirable characters present in two different parents to produce hybrids. It is a tedious job as one has to ensure that the pollen grains collected from the male parent reach the stigma of the female parent.
(d). Selection of superior hybrids: The progenies of the hybrids having the desired characteristics are selected through scientific evaluation. The selected progenies are then self-pollinated for several generations to ensure homozygosity.
(e). Testing, release, and commercialization of new cultivars: The selected progenies are evaluated for characters such as yield, resistance to diseases, performance, etc. by growing them in research fields for at least three growing seasons in different parts of the country. After thorough testing and evaluation, the selected varieties are given to the farmers for growing in fields for a large-scale production.

Or

Write any three ways to prevent alcohol or drug abuse in adolescents. What are withdrawal symptoms? (5)

20. Describe the process of replication of DNA. Why is it called semi-conservative? (4+1)

In the process of DNA replication, the DNA makes multiple copies of itself. It is a biological polymerization which proceeds in the sequence of initiation, elongation, and termination. The whole process takes place with the help of enzymes where DNA-dependent DNA polymerase being the chief enzyme.



DNA Replication Process

DNA Replication Steps
Following are the important steps involved in DNA replication:
Initiation
DNA replication demands a high degree of accuracy because even a minute mistake would result in mutations. Thus, replication cannot initiate randomly at any point in DNA.
For the replication to begin there is a particular region called the origin of replication. This is the point where the replication originates. Replication begins with the spotting of this origin followed by the unwinding of the two DNA strands.
Unzipping of DNA strands in its entire length is unfeasible due to high energy input. Hence, first, a replication fork is created catalyzed by polymerases enzyme which is an opening in the DNA strand.
Elongation
As the strands are separated, the polymerase enzymes start synthesizing the complementary sequence in each of the strands. The parental strands will act as a template for newly synthesizing daughter strands.
It is to be noted that elongation is unidirectional i.e. DNA is always polymerized only in the 5' to 3' direction. Therefore, in one strand (the template 3'→5') it is continuous, hence called continuous replication while on the other strand (the template 5'→3') it is discontinuous replication. They occur as fragments called Okazaki fragments. The enzyme called DNA ligase joins them later.

DNA Replication Fork
Termination
Termination of replication occurs in different ways in different organisms. In E.coli like organisms, chromosomes are circular. And this happens when the two replication forks between the two terminals meet each other.
Also Read: DNA Structure
Enzymes Involved In DNA Replication

DNA replication is a highly enzyme-dependent process. There are many enzymes involved in the DNA replication which includes the enzymes DNA-dependent DNA polymerase, helicase, ligase, etc. Among them, DNA-dependent DNA polymerase is the main enzyme.

DNA-dependent DNA polymerase:It helps in the polymerization and catalyzes and regularises the whole process of DNA replication with the support of other enzymes. Deoxyribonucleoside triphosphates are the substrate as well as the energy provider for the replication process. DNA polymerase is of three types:

DNA Polymerase I:It is a DNA repair enzyme. It is involved in three activities:

- *5'-3' polymerase activity*
- *5'-3' exonuclease activity*
- *3'-5' exonuclease activity*

DNA Polymerase II:It is responsible for primer extension and proofreading.

DNA Polymerase III:It is responsible for in vivo DNA replication.

Helicase:Helicase is the enzyme which unzips the DNA strands by breaking the hydrogen bonds between them. Thus, it helps in the formation of the replication fork.

Ligase:Ligase is the enzyme which glues the discontinuous DNA strands.

Primase:This enzyme helps in the synthesis of RNA primer complementary to the DNA template strand.

Endonucleases:These produce a single-stranded or a double-stranded cut in a DNA molecule.

Single-stranded Binding Proteins

It binds to single-stranded DNA and protects it from forming secondary structures.

DNA Replication in Prokaryotes

The DNA replication in prokaryotes takes place in the following place:

1. *The two strands of DNA unwind at the origin of replication.*
2. *Helicase opens the DNA and replication forks are formed.*
3. *The DNA is coated by the single-strand binding proteins around the replication fork to prevent rewinding of DNA.*
4. *Topoisomerase prevents the supercoiling of DNA.*
5. *RNA primers are synthesised by primase. These primers are complementary to the DNA strand.*
6. *DNA polymerase III starts adding nucleotides at the end of the primers.*
7. *The leading and lagging strands continue to elongate.*
8. *The primers are removed and the gaps are filled with DNA Polymerase I and sealed by ligase.*

It derives its name from the fact that it produces two copies of the original DNA molecule, each of which contains one of original strand, and one newly-synthesized strand.

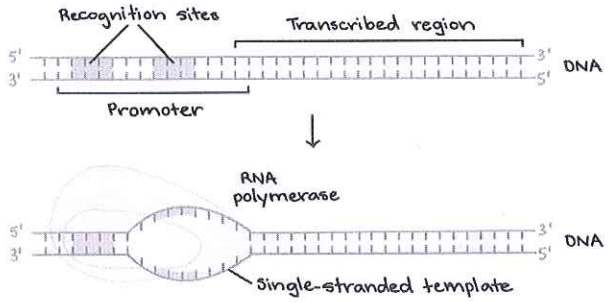
Or

Describe the process of transcription? What is splicing? (4+1)

Transcription is the first step of gene expression. During this process, the DNA sequence of a gene is copied into RNA. Before transcription can take place, the DNA double helix must unwind near the gene that is getting transcribed. The region of opened-up DNA is called a transcription bubble.

To begin transcribing a gene, RNA polymerase binds to the DNA of the gene at a region called the promoter. Basically, the promoter tells the polymerase where to attach on the DNA and begin transcribing. RNA polymerase recognizes and binds directly to these sequences. The sequences position the polymerase in the right spot to start transcribing a target gene, and they also make sure it is pointing in the right direction. Once RNA polymerase is in position at the promoter, the next step of transcription—elongation—can begin.

During elongation, RNA polymerase moves along one strand of DNA, known as the template strand, in the 3' to 5' direction. For each nucleotide in the template, RNA polymerase adds a matching (complementary) RNA nucleotide to the 3' end of the RNA strand. The RNA transcript is nearly identical to the non-template, or coding, strand of DNA. However, RNA strands have the base uracil (U) in place of thymine (T), as well as a slightly different sugar in the nucleotide.RNA polymerase will keep transcribing until it gets signals to stop. The process of ending transcription is called termination, and it happens once the polymerase transcribes a sequence of DNA known as a terminator. In Rho-dependent termination, the RNA contains a binding site for a protein called Rho factor. Rho factor binds to this sequence and starts moving up the transcript towards RNA polymerase. Rho-independent termination depends on specific sequences in the DNA template strand. As the RNA polymerase approaches the end of the gene being transcribed, it hits a region rich in C and G nucleotides. The RNA transcribed from this region folds back on itself, and the complementary C and G nucleotides bind together. The result is a stable hairpin that causes the polymerase to stall. In a terminator, the hairpin is followed by a stretch of U nucleotides in the RNA, which matches up with A nucleotides in the template DNA. The complementary U-A region of the RNA transcript forms only a weak interaction with the template DNA. This, coupled with the stalled polymerase, produces enough instability for the enzyme to fall off and liberate the new RNA transcript.



21. Name any one autosomal recessive Mendelian disorder. Show its pattern of inheritance in human beings and mention its cause. (3+2)

Or

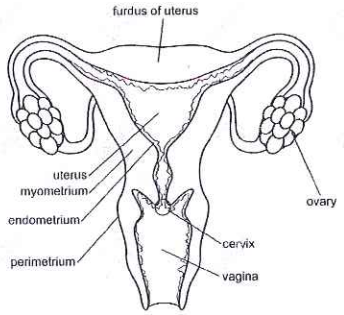
Describe the process of oogenesis in human female. Draw the structure of human female reproductive system. (2+3)

Oogenesis takes place from oogonium through successive stages

i)Multiplication phase: The cells of germinal epithelium of the ovary divide mitotically producing a couple of million egg mother cells in each fetal ovary.

ii)Growth phase : Oogonium grows into primary oocyte by taking in food from the surrounding follicles.

iii)Maturation phase- Each primary oocyte undergoes two maturation division , first meiotic and second meiotic. In the first meiotic division, the primary oocyte divides into two unequal haploid daughter cells- a large and a secondary oocyte and a very small first polar body. The 1st polar body degenerates.The secondary oocyte again divides and unequal cells at fertilization, a large ootid (n) and a very small 2nd polar body. The ootid grows into functional ovum within which male and female pronucleus remain disticntly until fusion.



FEMALE
REPRODUCTIVE SYSTEM
