Biology

Class - XII

Chapter Assignments

Chapter 1

Reproduction in Organisms

1 Mark Questions

1. No two individuals, especially in mammals (except monozygotic twins) look alike. What distinguishes them from the rest?
2. Offsprings produced by asexual reproduction are referred to as clones. Why?
3. Write the name of the organism that is referred to as "Tiger of Bengal."
4. How does Zygote usually differ from Zoospore in terms of ploidy?
5. Name an organism, where cell division in itself is a mode of reproduction.
6. What are zoospores? Mention its one characteristics and functions?
7. Name the vegetative propagules in the following
   i) Agave
   ii) Bryophyllum
8. Mention the main difference between the offspring produced by asexual reproduction and progeny produced by sexual reproduction.
9. Out of Date palm, Cucurbits, and pea which is monoecious.
10. Give the name of the phenomenon with reference to reproduction in rotifers, honeybees, and Turkeys.
11. Higher organisms have resorted to sexual reproduction inspite of its complexity. Why?
12. Tapeworms possess both male and female reproductive organs. What is the name given to such organism? Give two more examples of such organisms.
13. Distinguish between gametogenesis and embryogenesis.
14. Give one example of an animal which exhibits oestrus cycle.
15. Differentiate between oviparous and viviparous animals.
16. Mention the site of zygote formation in the ovule of a flowering plant. What happens to sepals, petals and stamens after fertilisation? State the fate of zygote, ovule and ovary in these plants
17. A few plants exhibit unusual flowering phenomena which flowers once in their life time and die. Suggest an evidence of the same from monocotyledon
18. All papaya and date palm plants produce flowers yet only few papaya and date palm seen to produce fruit. What could be the possible reason for the rest not producing them?
19. In nature for both plants & animals, hormones are responsible for transitions between the three phases of reproduction. Which 3 phases are being referred to here?
20. Though ginger is found under the soil. Yet it is not a root, but stem. Justify your answer.

2 marks Questions

1. Why dogs and cats have oestrus cycle but human beings have menstrual cycle, though all are mammals?
2. Coconut palm is monoecious while date palm is dioecious. Why are they so called?
3. In bisexual flowers, why is the transfer of pollen grains easier than in unisexual flowers? Name the specialized event in unisexual flowers which helps in transfer of pollen.
4. 'Vegetative reproduction is also a type of asexual reproduction.' Justify.
5. Arrange the following events in proper sequence:-
   i) Embryogenesis
   ii) Fertilization
   iii) Gametogenesis
   iv) Zygote formation.

   What will happen if meiosis does not take place during gametogenesis?
6. Why do algae and fungi shift to sexual mode of reproduction just before the onset of adverse conditions?
7. Rose plants produce large, attractive bisexual flowers but they seldom produce fruits. On the other hand, a tomato plant produces plenty of fruits though they have small flowers. Why do roses do not produce fruits?

Chapter 2

Sexual Reproduction in Flowering Plants

1 mark Questions

1. Do pollen grains survive in adverse conditions?
2. Non- albuminons seeds do not have endosperm, then from where do they take the food during germination?
3. If the number of chromosomes in the leaf cell of a flowering plant is 28, what number would you expect in the embryo and endosperm?
4. T.S. of anther shows four layers in the wall-epidermis, endothelium, tapetum and middle layer, Arrange them from outermost to innermost.
5. Give the scientific name of a plant which came to India as a contaminant with imported wheat and causes pollen allergy
6. Why are pollen grains produced in enormous quantity in Maize?
7. If the diploid number of chromosomes in an angiospermic plant is 16. Mention number of chromosomes in the endosperm and antipodal cell
8. An anther with malfunctioning tapetum often fails to produce viable male gameotypes. Give one reason.
9. Banana is a true fruit but is also a parthenocarpic fruit. Give reason.
10. What is pollen-pistil interaction and how it is mediated?
11. Name the part of flower that contributes to fruit formation in strawberry and guava respectively.
12. Arrange the following in correct developmental sequence :
13. Male gamete, Potential pollen mother cell, sporogenous tissue, Pollen grains, Microspore tetrad.
14. Name the type of flower which favors cross-pollination.

2 marks Questions

1. How many haploid cells are present in mature female gametophyte of a flowering plant? Name them.
2. What will be the fate of ovule if the synergids are absent in the embryo sac?
3. a)"The microspore is haploid while that of microspore mother cell is diploid" comment.

(b) How many male gametes and female gamets are produced by?

4. (i) Five microspore mother cell (ii) Five megaspore mother cell
5. Where is sporopollenin present in plants? State its significance with reference to its chemical nature.
6. Draw a schematic diagram of TS of a mature anther. Label only the layers that help in dehiscence of the anther to release pollen grains.
7. Fruits generally develop from ovary, but in few species thalamuscontributes to fruit formation.
   (a) Name the two categories of fruits.
   (b) Give one example of each

8. Differentiate between xenogamy and geitonogamy?
9. State one advantage and disadvantage of cleistogmy.
10. The flower of brinjal is referred to as chasmagamous, while that of beans is cleistogamous. How are they different from each other.
11. In angiosperms, zygote is diploid while primary endosperm cell is triploid. Explain?
12. List the post fertilization events in angiosperms?
13. Name the cell from which the endosperm of coconut develops. Give the characteristic features of endosperm of coconut.
14. Draw a labeled diagram of a matured embryo of a dicotyledonous plant.

3 marks Questions

1. Why angiosperm anthers are called dithecous? Describe the stricter of its microsporangium.
2. Explain double fertilization.
3. What are the differences between wind pollinated and insect pollinated flowers. Give examples.
4. Draw a longitudinal section of a post-pollinated pistil showing entry of pollen tube into a mature embryo sac. Label filiform apparatus, chalazal end, hilum, antipodals, male gamestes and secondary nucleus.
5. Draw a labeled diagram of typical anatropous ovules.
6. Draw a diagram of ale gametophyte of an angiosperm. Label any four parts. Why sporopollenin is considered the most resistant organic material?
7. A) Mention any four strategies adopted by flowering plants to prevent self-pollination.
   B) Why is geitonogamy also referred to as genetically autogamy?
8. Although sexual reproduction is a long drawn, energy-intensive complex form of reproduction, many groups of organisms in Kingdom Animalia and plantae prefer this mode of reproduction. Give atleast three reasons for this.
9. Differentiate between perisperm and endosperm giving one example of each.
10. With the help of an example of each explain :Apomixis, parthenocarpy, polyembryony.
11. Continued self-pollination lead to inbreeding depression. List three devices, which flowering plant have developed to discourage self-pollination?
12. If one can induce parthenocarpy through the application of phytohormones, which fruit would you select to induce parthenocarpy and why?

5 marks Questions

1. Explain with the help of diagram the development of mature embryo sac from a megaspore mother cell in angiosperm.

2. Why is fertilization in an angiosperm referred to as double fertilisaion? Mention the ploidy of the cells involved.
3. a) trace the development of embryo after syngamy in a dicot plant.
   b) endosperm development precedes embryo development. Explain.
   c) Draw a diagram of a mature dicot embryo and label cotyledons. Plumule, radicle, and hypocotyl in it.
4. How does pollen mother cell develop into a mature pollen grain? Illustrate the stages with the help of labeled diagram.
5. a) mature seeds of legumes are non-albuminous. Then, can it be assumed that double fertilization does not occur in legumes. Explain.
   b) List the differences between the embryos of dicot Pea and monocot(grass family)
6. Draw a labeled diagram of anther lobe at microspore mother cell stage. Mention the roles of different wall layers of anther.
7. Explain double fertilization and trace the post fertilization events in sequential order leading to seed formation in a typical dicotyledonous plant.
8. Draw a labeled diagram of the sectional view of a mature pollen grain in angiosperm. Explain the functions of its two different parts.

Chapter 3

Human Reproduction

1 mark Questions

1. Zygote undergoes mitosis to form 16 celled stage of embryo. What is it known as?
2. Both vaccine and colostrum produce immunity. Name type of immunity produced by these
3. Name the important mammary gland secretions that help in resistance of the new born baby.
4. Failure of testes to descend into scrotal sacs leads to sterility. Why?
5. Write the location and functions of following in human testes:
   i) Sertoli cells
   ii) Leydig cells
6. Each and every coitus does not result in fertilization and pregnancy. Justify the statement.
7. Where is acrosome present in humans? Write its functions.
8. How is the entry of only one sperm ensured into an ovum during fertilization in humans?
9. What stimulates pituitary to release the hormone responsible for parturition? Name the hormone.
10. The spermatogonial cell has 46 chromosomes in human male. Give the number of chromosomes in ñ
    - Primary spermatocyte
    - Spermatid
11. How many sperms will be produced from 10 primary spermatocytes and how many eggs will be produced from 10 primary oocytes?
12. Why are human testes located outside the abdominal cavity? Name the pouch in which they are present?

2 Marks Questions

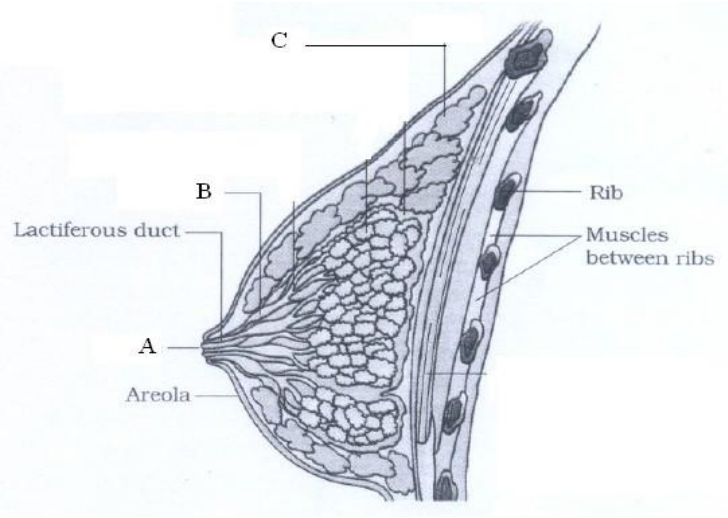
1. Why does fertilization take place in fallopian tube and not in uterus?
2. Which cell organelle is present in the neck of the sperm? What is its significance?
3. Differentiate between:
   i) Vas deferens and vasa efferentia
   ii) Spermatogenesis and spermiogenesis
4. What is meant by L.H. Surge? Write the role of L.H.
5. Draw and label the parts of the head region of a human sperm.
6. Where are fimbriae present in a human female reproductive system? Give their function.
7. Failure of fertilization leads to menstruation. Explain.
8. Give the function of
   (a)Corpus luteum
   (b)Endometrium

9. Give reason for the following :
   - The first half of the menstrual cycle is called follicular phase as well as proliferative phase.
   - The second half of the menstrual cycle is called luteal phase as well as secretory phase
10. Explain significance of the condition in which the testes remain suspended in scrotum outside the abdomen
11. Mention the role of gonadotropins in menstrual cycle. On what day os the menstrual cycle do the gonadotropins reach a peak?
12. Mention the sites of action of the hormone GnRH and FSH during spermatogenesis in human males. Give one function of each of the hormones.
13. Where does fertilization occurs in humans? Explain the events that occur during this process.
14. Placenta acts as an endrocine tissue. Justify.
15. What is colostrum? Why is it important to be given to the newborn infants?

3 Marks Questions

1. Name and explain the role of inner and outer walls of human uterus.
2. Draw a labeled diagram of the reproductive system in human female.
3. Explain the development of an ovum from an oogonium in a human female.
4. Mention the name and role of hormones which are involved in regulation of gamete formation in human male.
5. Mention the name and role of hormones which are involved in regulation of gamete formation in human male.
6. T.S. of mammalian testis revealing seminiferous tubules show different types of cell.
   (i) Name the two types of cells of germinal epithelium.
   (ii) Name of cells scattered in connective tissue and lying between seminiferous tubules.
   (iii) Differentiate between them on the basis of their functions
7. Draw a diagram of microscopic stricter of human sperm.
8. Mention the target cells of luteinizing hormone in human males and females. Explain the effect and the changes which the hormone induces in each case.
9. Write the function of each one of the following
   i) Fimbriae
   ii) Coleoptile
   iii) Oxytocin
10. Write the functions of:
   i) Middle piece in human sperm
   ii) Tapetum in anhers
   iii) Lutenising hormone in human males

11. Label a, b, c in the following diagram.



5 marks Questions

1. Give a schematic representation of oogenesis in humans. Mention the number of chromosomes at each stage. Correlate the life phases of the individual with the stages of the process
2. i) Draw a diagrammatic sectional view of a human seminiferous tubule and label Sertoli cells, primary spermatocyte. Spermatogonium, and spermatozoa.
   ii)Explain the hormonal regulation of the process of spermatogenesisis.
3. Explain the ovarian and uterine events that occur during a menstrual cycle in a human female under the influence of pituitary and ovarian hormones, respectively.
4. When and where are primary oocytes formed in a human female? Trace the development of these oocytes till ovulation (in menstrual cycle). How do gonadotropins influence this developmental process?
5. Give the term / reason :

a) Mechanism responsible for parturition.
b) Role of oxytocin during expulsion of the baby out of uterus
c) Why does zonapellucida layer block the entry of additional sperms?
d) Sperm cannot reach ovum without seminal plasma.
e) All copulations do not lead to fertilization and pregnancy.

6. Furnish the technical term for the following:

a) Cushion of fatty tissue covered by skin and pubic hair in female external genitalia.
b) The finger like projections which collect ovum after ovulation
c) The middle thick layer/wall of uterus
d) Semen without sperm
e) The finger-like projections appearing on the trophoblast after implantation.

7. Describe the post-zygotic events leading to implantation and placenta formation in humans. Mention any two functions of placenta.

8. A) When and how placentas develop in human female?

   B) How is the placenta connected to the embryo?

   C) Placenta acts as an endrocine gland. Explain.

9. a) Draw a labeled diagram of human female reproductive system

b) Enumerate the events in the ovary of a human female during

i) Luteal phase of menstrual cycle

ii) Follicular phase

Chapter 4

Reproductive Health

1 Mark Questions

1. Give the term for prenatal diagnostic technique aimed to know the sex of developing foetus and to detect congenital disorders
2. Mention one positive and one negative application of amniocentesis.
3. Why tubecomy is considered a contraceptive method?
4. Why do women use Saheli pills?
5. Name the oral contraceptive developed by CDRI, Lucknow.
6. Give one reason for statutory ban on amniocentesis.
7. Name the STD's which can be transmitted through contaminated blood.
8. Give technical name of female used to bring up in vitro fertilized egg to maturity.
9. Name the fluid from which foetal cells are extracted for chromosomal analysis.
10. At what stage Zygote can be introduced in the fallopian tube in Zygote Intra Fallopian Transfer (Z.I.F.T)?
11. What precautions a lady can take to prevent unwanted pregnancy?
    i) Name the barrier
    ii) Mention the composition of it.
12. Give the term for rapid population growth.
13. How does Cu-T act as an effective contraceptive for human females.
14. A doctor has been observed the chromosomal disorders in developing foetus and advised the couple to undergo abortion. Suggest the technique by which doctor absorbed the chromosomal disorders.
15. Explain Zygote Intra Fallopian Transfer Technique.
16. How is IUT different from ZIFT.
17. Test-tube baby programme is a boon to such couples. Explain the steps followed in the procedures.

2mark Questions

1. Briefly explain two natural barriers for birth control.
2. What are implants? How do they help in preventing fertilization?
3. During lactation chances of conception are almost zero.
   (i) Give the reason
   (ii) Give the term used to describe the phenomenon.
4. What do oral pills contain and how do they act as effective contraceptive?
5. Name any two copper-releasing Intra Uterine Devices. List two reasons that make them effective contraceptives

6. How do surgical procedures prevent conception in humans? Mention the way it is achieved in human males.
7. 'Intra-cytoplasmic sperm injection' and 'Gamete Intra Fallopian Transfer (GIFT)' are two assisted reproductive technologies. How is one different from another?
8. Fill in the spaces a,b,c and d.

COLUMN I	**COLUMN II**
IVF and ET	**a**
b	Introduction of Zygote or embryo with 8 blastomers into Fallopian tube
c	Introduction of ova of a donor into Fallopian tube
I.U.T.	**d**

9. Enlist any four possible reasons for infertility in human beings
10. Lactational Amenorrhea is a method of contraception Justify. What is the maximum effectiveness of this method in terms of period/duration?
11. How are non-medicated IUD'S different from hormone releasing IUD'S? Give examples.

3 marks Questions

1. Differentiate between Vasectomy and Tubectomy.
2. Give another name for sexually transmitted diseases. Name two sexually transmitted diseases which are curable and two diseases which are not curable.
3. Explain any two methods of Assisted Reproductive Technology (ART) that has helped childless couples to bear children.
4. Name and explain the surgical method advised to human males and females as a means of birth control. Mention its one disadvantage and one advantage.
5. Mention the various precautions one has to take in order to protect himself/herself form STDs.
6. A pregnant human female was advised to undergo MTP. It was diagnosed by her doctor that the foetus, she is carrying has developed from a zygote formed by an XX-egg fertilized by Y-carrying sperm. Why was she advised to undergo MTP?
7. What are the disturbing trends observed regarding MTP?
8. Name the techniques which are employed in following cases :
   (a) Transfer of an ovum collected from a donor into the fallopian tube of another female who cannot produce ova but can provide suitable environment for fertilization and development.

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

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

5 marks Questions

1 How are assisted reproductive technologies helpful to humans? How are ZIFT and GIFT different from IUT? Explain

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

Chapter 5

Principles of Inheritance and Variation

1 mark Questions

1. Give any two reasons for the selection of pea plants by Mendel for his experiments.
2. The son of hemophilic man may not get his genetic disorder. Provide reasons.
3. Name any one plant that shows the phenomenon of incomplete dominance during the inheritance of its flower colour.
4. What results in gain or loss of chromosomes during cell division?
5. Pea flowers produce assured seed sets. Give reason.
6. Name the base change and the amino acid change, responsible for sickle cell anaemia.
7. How would you find trhe genotype of an organism exhibiting a dominant phenotype trait?
8. What do you understand by 'true breeding lines' that are used to study inheritance pattern of traits in plants.
9. Why do normal red blood cells become elongated sickle-shaped structers in a person suffering from sickle-cell anemia?
10. Name one autosomal dominant and autosomal recessive Mendelian disorder in humans.
11. A garden pea plant produced axial white flowers another of the same species produced terminal violet flowers. Identify the dominant trait.
12. Name the disorder with the following chromosome complement.
    (i) 22 pairs of autosomes + X X Y
    (ii) 22 p airs of autosomes + 21st chromosome + XY
13. A haemophilic man marries a normal homozygous woman. What is the probability that their daughter will be haemophilic?
14. A test is performed to know whether the given plant is homozygous dominant or heterozygous. Name the test and phenotypic ratio of this test for a monohybrid cross.
15. What causes Down's syndrome in human beings?
16. Differentiate between monohybrid and dihybrid.
17. What do you understand by the term multiple allelism?

2 Marks Questions

1. Linkage and crossing over of genes are alternatives of each other. Justify.
2. Differentiate between point mutation and frameshift mutations.
3. Homozygous green seeded plant is crossed with yellow seeded plant. The progeny obtained was half yellow seeded and half green seeded.
    i) Write the genotype of yellow seeded progeny.
    ii) Write the technical name of the cross.

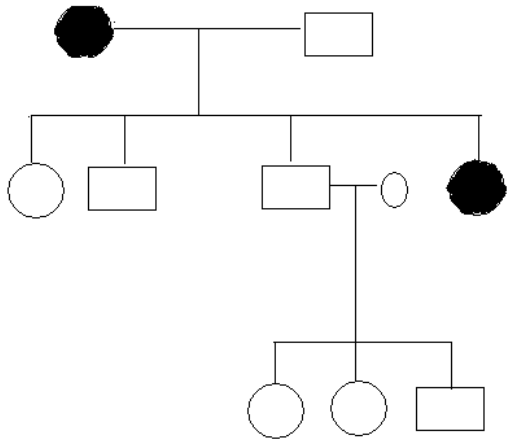
4. Identify the sex of organism as male or female in which the sex
5. chromosome are found as
   (i) ZW in bird
   (ii) XY in Drosophila
   (iii) ZZ in birds.
   (iv) XO in grasshopper
6. The human male never passes on the gene for haemophilia to his son. Why is it so?
7. Differentiate between
   i) Dominance and recessive
   ii) Homozygous and heterozygous
8. What do you understand by pleiotropy? Give example.
9. When a cross is made between tall pants and yellow seeds (TtYy) and tall pant with green seed, what proportions of phenotypes in the offspring could be expected to be
   i) Tall and green
   ii) Dwarf and Green
10. A cross between a red flower bearing plant and a white flower bearing plant of Antirrhinum produced all plants having pink colors. Workout a cross to explain this possibility.
11. Name a blood related autosomal Mendelian disorder? Why is it called a disorder? How is it transmitted from parents to offsprings.
12. Two heterozygous plants are crossed. If the two loci are linked what would be the distribution of phenotypic features if F_1 generation for a dihybrid cross?
13. A woman with blood group 'O' marries a man with blood group 'AB' . What would be the possible blood groups of progeny? List the alleles involved in this inheritance?
14. Why is the possibility of human female suffering from haemophilia rare?
15. The following table shows the genotypes for ABO blood grouping and their phenotypes. Fill in the gaps left in the table.

S.NO	Genotype	Blood Group
1	$I^A I^A$	A
2		A
3	$I^B I^B$	B
4		B
5	$I^A I^B$	
6		O

16. A cross was carries out between two pea plants showing the contrasting traits of height of the plants. The results of the cross showed 50% parental characters.
    i) Workout the cross with the help of Punnett square
    ii) Name the type of the cross carries out.
17. The male fruit fly and Female fowl are heterogametic, while the female fruit fly and the male fowl are homogametic. Why are they called so?
18. What is the contribution of T.H. Morgan in genetics?
19. Explain why a recessive allele is unable to express itself in a heterozygous state
20. Explain female heterogamety with the help of diagram?

3 Marks Questions

1. Explain law of dominance using a monohybrid cross.
2. What is pedigree analysis? Suggest how such an analysis can be useful.
3. Mention the advantages of selecting Pea plant for experiment by Mendel.
4. Who proposed chromosomal theory of inheritance? Point out any two similarities in the behavior of chromosomes and genes.
5. A non-haemophilic couple was informed by their doctor that there is possibility of a haemophilic child be born to them. Explain the basis on which the doctors conveyed this information. Give the genotypes and the phenotypes of all possible children who could be born to them.
6. I) Sickle cell anemia in humans is a result of point mutation. Explain?
   ii)Write the genotypes of both the parents who have produced a sickle-celled anemic offsprings.
7. A woman with O blood group marries a man with AB blood group
   (i) work out all the possible phenotypes and genotypes of the progeny
   (ii) Discuss the kind of dominance in the parents and the progeny in this case.
8. How are dominance, codominance and incomplete dominance patterns of inheritance different from each other?
9. In Mendelís breeding experiment on garden pea, the offspring of F2 generation are obtained in the ratio of 25% pure yellow pod, 50% hybrid green pods and 25% green pods State
   (i) which pod colour is dominant
   (ii) The Phenotypes of the individuals of F1 generation.
   (iii) Workout the cross.
10. In the following pedigree chart, state if the trait is autosomal dominant, autosomal recessive or sex linked. Give a reason for your answer



11. Explain the cause of Klinefelterís syndrome. Give any four symptoms shown by sufferer of this syndrome
12. How is the sex determination in humans different from birds? Explain.
13. I) Color blindness in humans is a sex-linked trait. Explain with the help of a cross.
    ii)In human beings, the sex of the child is determined by the father and not the mother. Explain.

5 marks Questions

1. A dihybrid heterozygous round, yellow seeded garden pea (Pisumsativum) was crossed with a double recessive plant.
   (i) What type of cross is this?
   (ii) Work out the genotype and phenotype of the progeny.
   (iii) What principle of Mendel is illustrated through the result of this cross?
2. I) Explain Mendel's law of independent assortment by taking a suitable example.
   ii)How dis Morgan show the deviation in inheritance pattern in Drosophilia with respect to this law?
3. A snapdragon plant homozygous for red flower when crossed with a white flower plant of the same species produced pink flowers in F_2-generation

1 What is this phenotypic expression called?

2 Workout the cross to show the F2-generation when F_1 was self-pollinated. Give the phenotypic and genotypic ratios of F2-generation

4. Two plants (snapdragon) with red flowers and white flowers are crossed and the following results are shown:

Red(RR) White(rr)

F1 generation: All pink flowers

i) What phenomenon is shown in F1 generation?

ii) Write the genotype of F1 and phenotype of F2 generation.

iii) What is the phenotypic and genotypic ratio of the F2 generation?

iv) With the help of a punnett square illustrate the result.

5. i) How does a chromosomal disorder differ from a Mendelian disorder?

   ii)Name any two chromosomal aberration-associated disorders?

   iii) List the characteristics of the disorders mentioned above that helped in their diagnosis.

6. I) A true breeding homozygous pea plant with green pods and axial flowers as dominant characters, is crossed with recessive homozygous pea plant with yellow pods and terminal flowers. Work out the cross up to F_2-generation giving the phenotypic ratios of F_1 and F_2-generation respectively.

II)Sate the Mendelian principle, which can be derived from such a cross and not from monohybrid cross.

7. Work out a monohybrid cross up to F2-generation between two pea plants and two Antirrhinum plants both having contrasting traits with respect to color of flower. Comment on the pattern of inheritance in the crosses carried above.
8. Explain the causes, inheritance pattern and symptoms of any two Mendelian genetic disorders.
9. Given below is a table showing the genotypes and the phenotypes of blood groups in the human population

Genotype	Phenotype
W	A
I^BI^D	Y
$I^A I^B$	Z
X	O

   I) Identify the genotypes (W) and (X) and the phenotypes (Y) and (Z).

   II) How is the codominance different from incomplete dominance

   III) Name the pattern of inheritance exhibited by the phenotypes (Y) and(Z) in the table.

Chapter 6

Molecular Basis of Inheritance

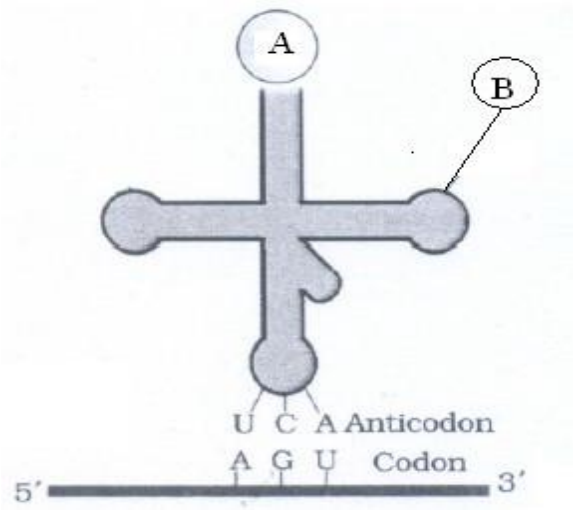
1mark Questions

1. Write the full form of RNA and DNA.
2. Which factor determines the coding strand and the template strand?
3. What function does B-galoctosidase carry out?
4. Isolation, digestion and separation of DNA in a specific gene. Name the technique.
5. Why is hnRNA required to undergo splicing?
6. During translation what role is performed by tRNA
7. Mention two ways in which Single Nucleotide Polymorphisms identified in human genome, can bring out revolutionary changes in biological and medical science.
8. Name the factors for RNA polymerase enzyme which recognises the start and termination signals on DNA for transcription process in Bacteria
9. What will happen if DNA replication is not followed by cell division in a Eukaroyotic cell?
10. RNA viruses mutate and evolve faster than other viruses. Why?
11. Mention the dual functions of AUG.
12. Mention the role of the codons AUG and UGA during protein synthesis.
13. Why only one mRNA is produced in transcription?
14. What is the use of DNA finger printing?
15. What do you mean by genetic code?
16. What are ESTs?
17. Differentiate between unambiguous and degenerate codons.
18. Differentiate Capping and Tailing?
19. What is genetic code?

2marks Questions

1. Give two reasons why both the strands of DNA are not copied during transcription.
2. Show DNA replication with the help of a diagram.
3. How would Lac operon operate in E coli growing in a cultural medium where lactose is present as source of sugar?
4. Draw a labeled diagram of a nucleosome. Where is it found in a cell? Give one function of histone protein and non-histone chromosomal protein in a eukaryotic nucleus.
5. Explain aminoacylation of tRNA.
6. Draw a schematic diagram of a part of double stranded dinucleotide DNA chain having all the four nitrogenous bases showing the correct polarity?
7. i) Label the amino acid at A, and write the name of RNA s below.

ii) Name the process



8. Three enzymes required for metabolism of lactose, what would happen to the machinery of the operon if mutation occur in z-gene.
9. A point mutation leads to adverse change in the function of hemoglobin (Bglobin chain). Identify the disease that may occur due to this mutation. Mention the change of amino acids in the polypeptide due to this mutation.
10. Why is charging of tRNA necessary during translation process.
11. What is the full form of VNTR? How is it different from probe?
12. Genetic code is specific and nearly universal. Justify.
13. What role does ribsome play in peptide bond formation? How does ATP facilitate it?
14. Explain:
    i) Degenerate code
    ii) Unambiguous code
    iii) Universal code
    iv) Initiator code.
15. Why is human genome project called a mega project?

3marks Questions

1. What are point mutation, Frameshift mutation, and silent mutation?
2. Given below is a part of the template strand of a structural gene.
   TAC CAT TAG GAT
   I) Write its transcribed m RNA strand with its polarity.
   II) Explain the mechanism involved in initiation of transcription of this strand.
3. How is peptide bond formed?
4. The length of a DNA molecule in a typical mammalian cell is calculated to be approximately 2.2 m. How is the packaging of this long molecule done to accommodate it within the nucleus of the cell?

5. Why DNA is considered a better hereditary material than RNA.
6. i) Why is t RNA called an adapter.

   ii)Draw and label a secondary of t RNA. How does the actual structuer of tRNA looks like.
7. The base sequence in one of the DNA is TAGCATGAT

   I) Give the base sequence of the complementary strand

   II) How are these base pairs held together in a DNA molecule?

   III) Explain the base complementarity rule. Name the scientist who framed this rule.
8. Give six points of difference between DNA and RNA in their structure/ chemistry and function.
9. Explain the role of regulatory gene in a lac operon. Why is regulation of lac operon called negative regulation?
10. i) Which human chromose has
    - maximum number of genes
    - which one has fewest genes

ii)Write the scientific importance of single nucleotide polymorphism identified in human genome.

11. Explain how does thehnRNA become the mRNA.
12. Given below are the sequence of nucleoside in a particular m RNA and amino acids coded by it

    UUUAUGUUCGAGUUAGUGUAA

Phe-Met-Phe-Glu-Leu-Val

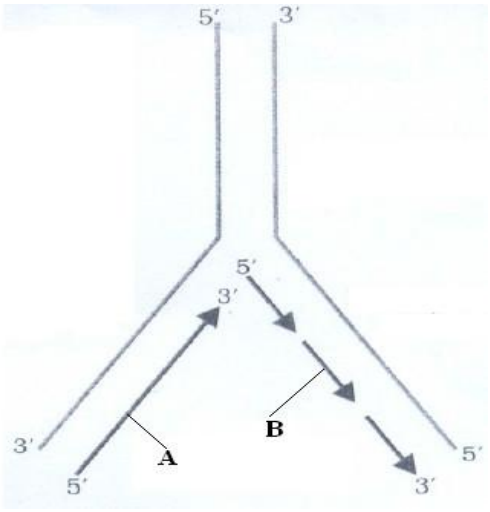
Write the properties of genetic code that can be and that cannot be correlated from the above given data.

13. Name the three major types of RNAs, specifying the function of each in Illustrate schematically the process of initiation, elongation and termination during transcription of a gene in a bacterium the synthesis of polypeptide
14. A tRNA is charged with the amino acid methionine.

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

    (ii) Write the Codon for methionine.

    (iii) Name the enzyme responsible for binding of amino acid to tRNA.
15.



i) Name fragment A) & B)

ii) Name the process of given diagram

iii) In what phase of cell cycle this process takes place.

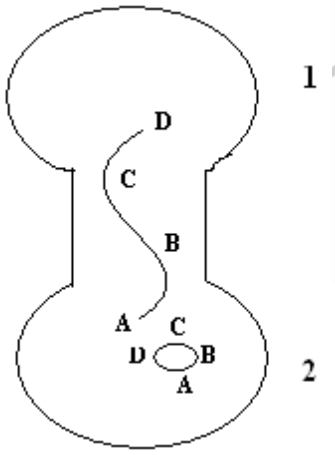
16. If a double stranded DNA has 20% of cytosine, Calculate the percent of adenine in the DNA.
17. Explain the functions of:
    i) Promoter
    ii) Exons
    iii) tRNA

5 Marks Questions

1. Describe initiation, elongation, and termination process of transcription in bacteria.
2. What is meant by semi conservative replication? How did MeselsonandStahl prove it experimentally?
3. Given below is the schematic representation of lac operon E. coli. Explain the functioning of this operon when lactose is provided in the growth medium of the bacteria.

i	p	o	Z	y	a

4. Given below schematic representation of two interacting bacterial cells.



i) Name the bacterium and describe the process illustrate.

ii) What is the use of such process in genetics?

iii) Which of two cells act as male?

iv) Draw a labeled diagram of stage immediately next to the one shown here

4. i) Write the conclusion drawn by Griffith at the end of his experiment with Streptococcus pneumonia.

ii)How did O Avery, C MacLeod and M McCarty prove that DNA was the genetic material? Explain.

5. Describe Hershey and Chase's experiment? What was the aim of this experiment?
6. Describe the various steps involved in the technique of DNA fingerprinting

7. Where do transcription and translation occur in bacteria and eukaryotes respectively? Explain the complexities in transcription and translation in eukaryotes that are not seen in bacteria?
8. Diagrammatically represent a portion of the double stranded polynucleotide chain sequence in a DNA molecule involving all the four nitrogenous bases.
9. What does the lac operon consist of? How is the operator switch turned on and off in the expression of genes in this operon? Explain
10. Explain the steps of DNA fingerprinting that will help in processing of the two blood samples 'A' and 'B' picked up from the crime scene.

Chapter 7

Evolution

1mark Questions

1. Name one fish like reptile that evolved from land reptile about 200 million years ago?
2. Name any two vertebrates body parts that are homologous to human forelimbs.
3. What is 'saltation' according to de Vries?
4. What does hardy-Weinberg equation
   $P^2 + 2pq + q^2=1$, convey?
5. For a long time, it was believed that life originated from decaying matter. What is this theory known as? Name the scientist who experimentally disproved this theory.
6. What is the significance of Coelacanth in evolution?
7. Name the common ancestors of great apes and man.
8. Which evolution has resulted in the development of structures like wings of butterfly and bird? What are such structures called?
9. State the significance of biochemical similarities among diverse organisms in evolution.
10. Name the person who proposed that population tends to increase geometrically while food production increases arithmetically
11. Name the scientist who had also come to similar conclusion as that of Darwin about natural selection as a mechanism of evolution. Which place did he visit to come to conclusions?
12. Name the placental mammals corresponding to the Australian spotted Cuscus and Tasmanian tiger cat, which have evolved as a result of convergent evolution.

2marks Questions

1. Explain Oparin-Haldane theory of chemical evolution of life.
2. How is darwin's concept of evlolution different from de Vries?
3. Mention the contribution of SL Miler's experiments to origin of life.
4. What is genetic equilibrium? Knowing that genetic drifts disturbs this equilibrium mention what does this disturbance in genetic equilibrium leads to?
5. Distinguish between convergent and divergent evolution giving one example of each.
6. Rearrange the following in increasing order of evolution:
   Gnetales; Ferns; Zosterophyllum; Ginkgo
7. What is adaptive radiation? Explain with an example.
8. Write about the ancestry and evolution of bat, horse and human on the basis of a comparative study of their forelimbs. What are these limbs categorized as?
9. How does the fitness of population helps in evolution.
10. How did Louis Pasteur disprove spontaneous generation theory?

3marks questions

1. Explain antibiotic resistance observed in bacteria in the light of Darwin's theory of evolution.
2. Explain adaptive radiation and convergent evolution by taking example of Australian marsupials and Australian placental mammals.
3. Industrial Melanism in peppered moth is an excellent example of Natural selection, Justify the statement.
4. i) State the Hardy-Weinberg principle.
   ii)When there is a disturbance in the Hardy-Weinberg equilibrium, what would it result in?
   iii)According to this principle, what is the sum total of all allelic frequencies?
5. Darwin observed a variety of beaks in small black birds inhabiting Galapagos Islands. Explain what conclusion did he draw and how?
6. Give examples to show evolution by anthropogenic action
7. Convergent evolution leads to analogous structures, whereas divergent evolution leads to homologous structures. Explain.
8. State the theory of biogenesis. How does Miller experiment support this theory?
9. Classify the following as examples of homology and analogyñ
   (i) Hearts of fish and crocodile
   (ii) Wings of butterfly and birds
   (iii) Eyes of Octopus and Mammals
   (iv) Tubers of potand Sweet potato
   (v) Thorns of Bougainvillea and spines of Opuntia
   (vi) Thorn of Bougainvillea and tendrils of cucurbits.
10. According to Darwinian Theory, the rate of appearance of new forms is linked to their life cycles. Explain?
11. Explain the three ways in which natural selection operates on different traits in nature.
12. Discovery of lobefins is considered very significant by evolutionary biologists. Explain.

5marks Questions

1. With the help of suitable diagram, represent the operation of natural selection on different traits.
2. i) Explain taking one example of vertebrates' anatomy that evolution of life has occurred on earth.
   ii)'Nature selects for fittest.' Explain with suitable examples
3. Is evolution a process or the end result of a process? Discuss. Describe various factors that affect Hardy-Weinberg equilibrium
4. Explain the salient features of Hugo de Vries theory of mutation. How is Darwin's theory of natural selection different from it? Explain.

Chapter 8

Human Health and Disease

1mark Questions

1. Name the diagnostic test which confirms typhoid.
2. When does a human body elicit an anamnestic response?
3. Name any two types of cells that act as 'cellular barriers' to provide innate immunity in humans.
4. How does haemozoin affect the human body when released in blood during malarial infection
5. You have heard of many incidences of Chickengunya in our country. Name the vector of the disease.
6. Mention the useful and harmful drug obtained from the latex of poppy plant.
7. Name the type of cells, the AIDS virus enters into after getting in the human body.
8. Only Female Anopheles mosquito acts as a vector? Why?
9. What is the reason of shivering in malarial patient?
10. A group of viruses infect only nose and the respiratory passage but not the lungs.
11. Breast fed babies are more immune to diseases than the bottle fed babies. Why?
12. Why do pollen grains of some flowers trigger sneezing in some people?
13. What role do macrophages play in providing immunity to humans?
14. Name the pathogen which causes malignant malaria.
15. A doctor injects preformed antibodies against a snake bite. What type of immunity does it develop in the patient?

2mark Questions

1. Differentiate between active and passive immunity.
2. Name the missing organisms/ diseases in the table given below.

Organism	Disease
Microsporum	A
B	Elephantiasis
C	Amoebiasis
Plasmodium falciporam	D

3. Where are B-cells and T-cells formed? How do they differ from each other?
4. Name the parasite that causes filariasis in humans. Mention its two diagnostic symptoms. How is this transmitted to others?
5. What would happen to the immune system, if thymus gland is removed from the body of a person?

6. Name two special types of lymphocytes in humans. How do they differ in their roles in immune response?
7. Why an antibody is represented H_2L_2?
8. Lymph nodes are secondary lymphoid organs. Describe the role of lymph nodes in our immune response
9. How is an allergic reaction caused by an allergen? Name the drug that can reduce the symptoms of allergy.
10. What is the role of histamine in inflammatory response? Name few drugs which reduce the symptoms of allergy.
11. Name the host and the site where the following occur in the life cycle of a malarial parasite
    i) formation of gametocytes
    ii) Fusion of gametocytes
12. What is 'withdrawal syndrome'? List any two symptoms it is characterized by.
13. What is colostrum? Why is it important to be given to the newborn infants?
14. List four reasons to justify ban on intake of cannabinoids by sportsperson.
15. Name the opioid drug and its source plant. How does the drug affect the human body?
16. State the effect of carcinogens on human body. Name the carcinogenic ionizing and non-ionizing radiations. Mention their carcinogenic effect.
17. Cancer is one of the most dreaded diseases. Explain 'contact inhibition' and 'metastasis' with respect to disease.
18. Why are cancer patients given α-interferon as part of the treatment.

3marks Questions

1. What are Cannabinoids? From which plant Cannabinoids are obtained? Which part of the body is affected by consuming these substances?
2. i) Name the causative organisms for the following diseases.
    - Elephantiases
    - Ringworm
    - Amoebiasis

    ii)How can public hygiene help control such diseases?
3. Trace the events occur in human body to cause immunodeficiency, when HIV gains entry into the body.
4. A person claimed that he has seen sounds, heard colors and smelt light.

(i) What could be the possible reason?

(ii) Name two chemicals responsible for this condition.

(iii) Mention any one source for these chemicals.

5. Mention any three causes of drug abuse. Suggest some measures for the prevention and control of drug abuse
6. i) All human beings have cellular oncogenes but only few suffer from cancer. Give reason.
   ii) How is malignant tumor different from a beningn tumor?
7. How is innate immunity different from the immunity that you require through vaccines? Describe any two ways by which innate immunity can be accomplished.
8. A person shows unwelcome immunogenic reactions while exposed to certain substances.
   - Name this condition.
   - What common term is given to the substances responsible for this condition?
   - Name the cells and the chemical substances released which cause such reactions
9. i) Name the infective stage of Plasmodium, whch Anopheles mosquito takes in along with the blood meal from an infected human.
   ii) Why does the infection cause fever in humans.
   iii)Give a flow chart of the part of the life cycle of this parasite passed in this insect.
10. What is innate immunity? List the four types of barriers which protect the body from the entry of the foreign agents.
11. Write the source and effect on the human body of the following drugs.
    i) Morphine
    ii) Cocaine
    iii) Marijuana
12. i) Name thee drug used (A) as an effective sedative and pain killer (b) for helping patients to cope with mental illness like depression but often misused.

ii)How does moderate and high dosage of cocaine affect the human body.

5marks Questions

1. Answer the following with respect to Caner
   i) How does a cancerous cell differ from a normal cell?
   ii) Benign tumor is less dangerous than malignant tumor. Why?
   iii) Describe causes of cancer.
   iv) Mention two methods of treatment of the disease.
2. Explain the process of replication of a retrovirus after it gains entry into the human body.
3. The pathogen of a disease depends on RBCs of human for growth and reproduction. The person with this pathogen suffers with chill and high fever
   i) Identify the disease.
   ii) Name the pathogen.
   iii) What is the cause of fever?
   iv) Represent the life cycle of the pathogen diagrammatically

4. A person in your colony has recently been diagnosed with AIDS. People/ residents in the colony want him to leave the colony for the fear of spread of AIDS.
   i) Write your view on the situation. Give reason.
   ii) List the possible preventive measures that you would suggest to the residents of your locality in a meeting organized by you so that they understand the situation
   iii) Write the symptoms and the causative agents of AIDS.

Chapter 9

Strategies for Enhancement in Food Production

1mark Questions

1. What do you understand by Animal Husbandry?
2. Write two qualities of Saccharumofficinarum(Sugarcane) grown in South India.
3. Which process decreases fertility and productivity in crops?
4. Why is inbreeding necessary in animal husbandry?
5. Which product of Apiculture is used in cosmetics and polishes?
6. Semi-dwarf varieties of a crop plant were derived from IR-8. Name that crop.
7. Why do we use apical and axillary meristems for tissue culture?
8. Which one of the following is used in apiculture Hilsa, Apis, Indica, Sonalika?
9. Which strategy is used to increase homozygosity in cattle for desired traits?
10. What is an alternate source of protein for animal and human nutrition?
11. Name the technology which in addition to tissue culture techniques play a pivotal role in enhancing food production
12. Define bio-fortification?
13. Why mutation breeding is necessary for producing disease resistance?
14. Name the organism commerciallyused for the production of sible cell protein?
15. Why hybrids of selected parents are self-pollinated till a state of homozygosity?
16. Why the breeding programme for millets is mainly focused for the development of high yielding varieties?

2mark Questions

1. Give the advantage and disadvantage of inbreeding among cattle?
2. Name the pest organisms for which Pusa stem- 2 &pusa stem – 3 are prepared as pest resistant recombinants.
3. Why are proteins synthesized from Spirulina called Single celled Proteins? What is the significance of such a protein
4. Differentiate between inbreeding and outbreeding in animals.
5. How is a purelin in an animal raised? Explain.
6. Is it possible to obtain healthy potato from a virally infected potato? How?
7. How are somaclones produced? How do they differ from somatic hybrids?
8. How does culturing of Spirulina solve the food problems of the growing population?
9. The somatic hybrid of tomato & potato is 'pomato' but it is not grown on commercial scale. Why?
10. Honey collection improves, when beehives are kept in crop-fields during flowering season. Explain.
11. Give four important components of poultry farm management.

12. How is outcrossing different from cross breeding?
13. Complete the following table:

Wheat	A	Resistant to leaf and stipe rust
B	PusaSwarnim	Resistant to white rust
Cauliflower	C	Resistant to black rot
Q	Pusasadabahar	E

3marks Questions

1. What is micro propagation? Why are plants produced by this technique called somaclones? Name any two food plants which are produced on commercial scale using this method.
2. What is inbreeding depression and how is it caused in organisms? Write any two disadvantages of inbreeding?
3. What is 'blue revolution'? Name two freshwater and two marine edible fishes?
4. "Artificial insemination helps overcome several problems of normal mating". Justify the statement and list a few of them.
5. What is meant by germplasm Collection? Describe its significance in plant breeding programmes.
6. Following are the steps for breeding process. Arrange them in correct order, name the process & state its advantages.

i) The female is mated with a male of good variety
ii) The fertilized egg at 8-32 called stage are recovered & transferred to surrogate mother.
iii) The female is administered hormones to induce super-ovulation.

7. List any three outbreeding practices carried out to breed domestic animals. Explain the importance of each one.
8. What efforts must be put in, to improve health? Hygiene and milk yield of cattle in dairy farm.
9. To which product, following products are related (a) Blue revolution (b) white revolution (c) Green revolution
10. What is mutation? Explain the significance of mutation in plant breeding. Give an example of a disease resistant variety of cultivated plant induced by mutation
11. i)How can crop varieties be made disease resistant to overcome food crisis in India?
    ii) Name one disease resistant variety in India of
    - Wheat to leaf and stripe rust
    - Brassica to white rust
12. Mention the property of plant cells that has helped them to grow into new plant in *in vitro* conditions. Explain the advantages of micro-propagation.
13. Define totipotency of a cell? List the requirements, if the objective is to produce soma-clones of a tomato plant on commercial scale?

5marks Questions

1. Does apiculture offer multiple advantages to farmers? List its advantages, if it is located near a place of commercial flower cultivation. Name the most common species of bee which is reared in India
2. i) State the objective of animal breeding.

ii)List the importance and limitations of inbreeding. How can the limitations be overcome?

iii)Give an example of a new breed each of cattle and poultry.

3. With advancements in genetics, molecular biology and tissue culture, new traits have been incorporated into crop plants. Explain the main steps in breeding a new genetic variety of a crop?
4. What is somatic hybridization? Describe the various steps in producing somatic hybrids from protoplasts. Mention any two uses of somatic hybridization

Chapter 10

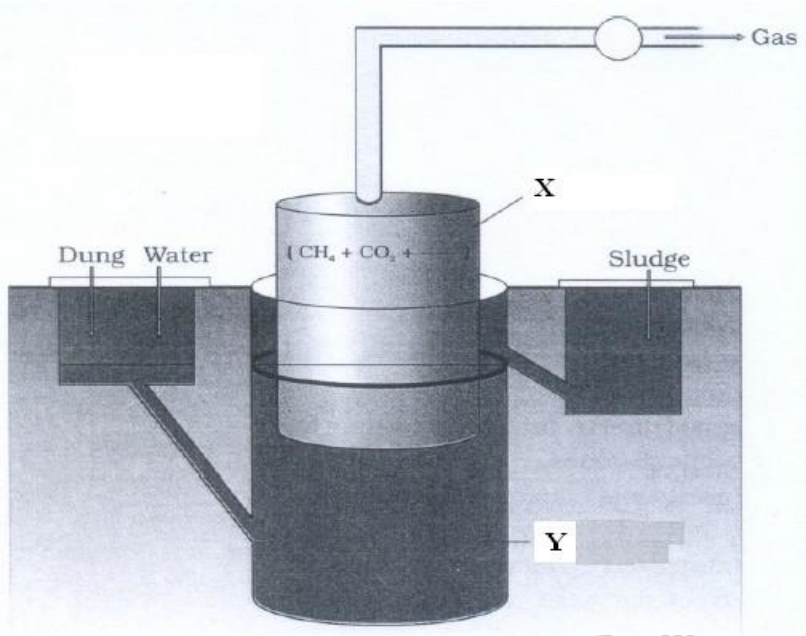
Microbes in Human Welfare

1mark Questions

1. Drinks like Whisky and Rum are more intoxicating than wine. Why?
2. Which of the following is the baker's yeast used in fermentation?
   Saccharumbarberi, Saccharomyces cerevisiae and Sonalika.
3. Bottled juices are clearer compared to homemade juice. Give reason.
4. Why is secondary treatment of water in sewage treatment plant called biological treatment?
5. Consuming curd keeps the gastro-intestinal tract intact. Give reason.
6. An antibiotic called Wonder Drug was used to treat the wounded soldiers of America during World War-II. Name the drug and the scientist who discovered it.
7. Alexander Fleming discovered Penicillin, but its full potential as an effective antibiotic was established by other scientists. Name the two scientists
8. Write the scientific name of the microbe used for fermenting malted cereals and fruit juices.
9. How do lactic acid bacteria help in increasing the nutritional quality of curd?
10. State one reason for adding blue-green algae to the agricultural soil.
11. The excreta of cattle do not contain any cellulose but human excreta may contain cellulose. Why?
12. Why are some microbes useful in detergent formulation?
13. In what way the relationship between BOD and organic matter in Sewage will be useful in ecology?
14. What role does cyanobacteria as biofertilisers?
15. Name the group of organisms and the substrate that act o to produce biogas.

2marks Questions

1. Name two alcoholic drinks produced in each of the following ways.
   (i) By distillation and (ii) without distillation
2. Bacteria that convert effluent into activated sludge play one more beneficial side. Mention the role.
3. Lactic Acid Bacteria (LAB) is commonly used in the conversion of milk intocurd. Mention any two other functions of LAB that are useful to humans.
4. Name the source of streptokinase. How does this bioactive molecule function in our body?
5. How do mycorrhizae function as biofertilisers? Explain with example.
6. How do mycorrhizae act as biofertilisers? Explain. Name a genus of fungi that forms a mycorrhizal association with plants.
7. In the given figure label X & Y and explain the functioning of the below plant.



8. During the secondary treatment of the primary effluent. How does the significant decrease in BOD occur?
9. Identify A,B,C,D in the table given below:

Microorganisms	Product	Biological activity	Medical oilment/Procedure
A	Streptokinase	Clot Buster	D
TrichodermaPolysporum	B	C	Transplant Surgery

10. State the use of following enzymes/acids produced by microbes
    i) Lipase
    ii) Lactic acid
    iii) Streptokinase
    iv) Pectinase
11. Why is Rhizobium categorized as a symbiotic bacterium? How does it act as biofertilisers?
12. What re methanogens? Name the animals in which methanogens occur and the role they play there.
13. Draw a labeled sketch of biogas plant.
14. What is biochemical oxygen demand (BOD) test? At what stage of Sewage treatment this test is performed? BOD level of three samples of water labeled as A, B and C are 30 mg/L, 10mg/Land 500 mg/L respectively. Which sample of water is most polluted?
15. What are statins? Name the microorganism that produces this substance. How is it medically important?
16. How has fungus Trichodermapolysporum proved to be very essential to organ transplant patients?

3marks questions

1. For what significant properties the Baculoviruses are considered as best Biological control agent? Mention its importance in organic farming.
2. Name two different categories of microbes naturally occurring in sewage water. Explain their role in cleaning sewage water into usable water.
3. How is Bt cotton plant created as a GM plant? How is it protected gainst bollworm infestation?
4. Complete the following table:

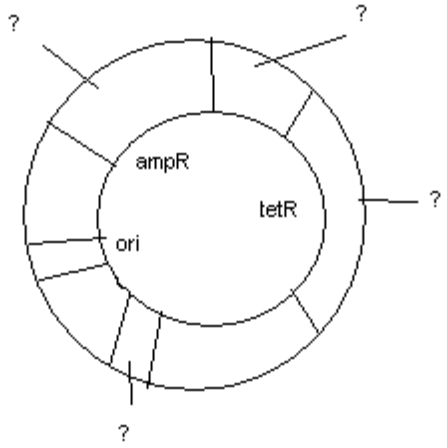
Microbes	Product	Use
Streptococcus	A	D
Lactobacillus	B	E
Saccharomyces Cerevisiae	C	F

5. How is biogas obtained from activated sludge?
6. How are flocs produced in the secondary treatment plant of the sewage? Explain their role?
7. I) Why do farmers prefer biofertilisers to chemical fertilizers? Explain.
   ii) How do Anabaena and mycorrhiza act as biofertilisers?
8. Name he genus to which baculoviruses belong. Describe their role in the integrated pest management programme.
9. i) What is organic farming? Why is it suggested to witch over to organic farming?
   ii)Why do organic farmers not recommend eradication of insect pests? Explain with reasons.
10. Why should biological control of pests and pathogens be preferred to the conventional use of chemical pesticides? Explain how the following microbes act as biocontrol agents?
    i) Bacillus thuringiensis
    ii) Nucleopolyhedovirus.

5marks Questions

1. Explain the process of sewage water treatment before it can be discharges into natural water bodies. Why is this treatment essential?
2. How does primary sludge differ from activated sludge? What type of changes in the sludge is carried out in anaerobic sludge digester? Give the composition of biogas produced in the sewage treatment plant.
3. (i) Three water samples namely river water, untreated sewage water and secondary effluent discharge from a sewage treatment plan were subjected to BOD test. The samples were labeled A, B and C but the lab attendant did not note which BOD is for which water. The BOD values of three samples A, B and C were recorded as 20mg/L, 8mg/L and 400mg/L respectively. Which sample of the water is most polluted? Can you assign the correct label to each, assuming that the river water is relatively clean?
   ii) What is the role of polymerase?

iii)Label the following diagram & Identify the selectable markers



iv)Which is not a tool of Recombinant DNA technology?

a) Restriction enzyme

b) Vector

c) Bioreactor

4. I)Name the category of microbes naturally occurring in sewage and making it less polluted during the treatment

ii)Explain the different steps involved in the secondary treatment of sewage.

Chapter 11

Biotechnology: Principles and Processes

1mark Questions

1. Restriction Enzymes are called "Molecular scissors". In what context they are referred so?
2. Why is it not possible for an alien DNA to become part of a chromosome anywhere along its length and replicate normally?
3. Mention the type of host cells suitable for he gene guns to introduce an alien DNA?
4. Name two commonly used vectors in genetic engineering
5. Write conventional nomenclature of EcoRI.
6. Mention the uses of cloning vector in biotechnology.
7. An extra chromosomal segment of circular DNA of a bacterium is used to carry gene of interest into the host cell. What is the name given to it.
8. Biotechnologists refer to Agrobacterium Tumefaciens as a natural genetic engineer of plants. Give reasons to support the statement.
9. How is exonuclease different from endonuclease?
10. Why DNA fragments move towards the anode during gel electrophoreses?
11. What special feature do prokaryotes have to defend themselves from bacteriophages?
12. Identify the recognition sites in the given sequences at which E.coli will be cut and make sticky ends.
    5'-GAATTC-3'
    3'-CTTAAG-5'
13. Eukaryotes do not have restriction endonuclease, then how they manage with normal endonuclease enzyme?
14. Name the enzyme that is used for the isolation of DNA from bacterial and fungal cells for recombinant DNA technology?
15. What are bioreactors?

2marks Questions

1. Is advisable to use different restriction endonucleases to cut the vector DNA and source DNA? Why?
2. How do Ori and cloning sites facilitate cloning into a vector?
3. How does plasmid differ from chromosomal DNA?
4. How are sticky ends formed on DNA strand? Why are they called so?
5. Name two main steps which are collectively referred to as down streaming process. Why is this process significant?
6. What will happen if more than one recognition sites are present in a vector?

7. Why is making cells competent essential for biotechnology experiments? List any two ways by which this can be achieved?
8. How did Cohen and Boyer contributed immensely in biotechnology?
9. Mention two classes of restriction enzymes. Suggest their respective roles.
10. Uncontrolled recombinant DNA technology experiments are dangerous to mankind. Comment on it.
11. (a) Which is the most commonly used matrix in gel electrophoresis?
    (b) What is the source of it?
12. Explain the role of Ti plasmids in biotechnology?
13. a) A recombinant vector with a gene of interest inserted within the gene of α-galactosidase enzymes is introduced into a bacterium. Explain the method that would help in selection of recombinant colonies from non-recombinant colonies?

b) Why is this method of selection referred to as insertional inactivation?

12. How are the DNA fragments separated by gel electrophoreses visualized and separated for use in constructing recombinant DNA?
13. Name the natural source of agarose. Mention one role of agaroe in biotechnology.
14. In the given process of separation and isolation of DNA fragments, some of the steps are missing, Complete the missing steps ñ

A: Digestion of DNA fragments using restriction endonucleases

↓

B: .....

↓

C: Staining with ethidium bromide

↓

D:Visualization in U.Vlight

↓

E: .....

↓

F: Purification of DNA fragments.

15. What is the source of thermostable DNA polymerase and Name that polymerase? Why thermostable DNA polymerase is essential in PCR?
16. Any recombinant DNA with a desired gene is required in billion copies for commercial use. How is the amplification done? Explain.
17. Explain the contribution of Thermusaquaticus in the amplification of a gene of interest.
18. Is there any difference between recombinant DNA and recombinant protein? Support your answer

3marks questions

1. Since DNA is a hydrophillic molecule, it cannot pass through cell membranes. Name and explain the technique with which the DNA is forced into (ii) a bacterial cell (ii) a plant cell (iii) an animal cell
2. Explain the following, emphasizing their formation.
   - rDNA
   - cDNA
   - dsRNA
3. Give the correct term for the following; -
   - Replacing a defective mutant allele with a normal functional allele / gene.
   - Increasing the copies (content) of a gene
   - Preventing m-RNA translation
   - Specific pattern of base pairs that are recognized by restriction enzymes.
   - Mobile genetic element
   - One DNA copies itself and produces two
4. How will you obtain purified DNA from a cell?
5. Name and describe the technique that helps in separating the DNA fragments formed by the use of restriction endonuclease.
6. Draw a schematic diagram of the E.coli cloning vector PBR322 and mark the following
   i) Ori
   ii) Rop
   iii) Ampicillin resistance gene
   iv) Tertacyline resistance gene
   v) Restriction site Bam HI
   vi) Restriction site Eco RI.
7. Why is Agrobacterium- mediated genetic engineering transformation in plants considered as natural genetic engineering?
8. What are 'cloning sites' in a cloning vector? Explain their role. Name two such sites in Pbr322.
9. Explain the use of:
   i) Plasmid DNA
   ii) Recognition sequence
   iii) Gel electrophoresis
10. Name the enzyme involved in the following process:
    i) Repeated amplification of DNA fragments.
    ii) Formation of short piece of RNA strand for annealing.
    iii) Breaking of bacterial cell to release DNA and other macromolecules.
    iv) Cutting and rejoining DNA fragments.
    v) Formation of m-RNA.

11. Observe the given sequence of nitrogenous bases on a DNA fragment and answer the following question-

    5′- CAGAATTCTTA- 3′

    3′- GTCTTAAGAAT- 5′

    i) Name a restriction enzyme which can recognize this DNA sequence.

    ii) Write the sequence after digestion

    iii) Why are the ends generated after digestion called sticky ends?

12. Why a cell must be made competent to take up DNA? Explain the steps by which bacterial cells made competent to take up plasmid/Rdna.

13. A selectable marker is used in the section of recombinants on the basis of their ability to produce colour in presence of chromogenic substrate.

    i) Mention the name of mechanism involved.

    ii) Which enzyme is involved in production of colour?

    iii) How is it advantageous over using antibiotic resistant gene as a selectable marker?

14. i) What is a bioreactor? How does it work

    ii) Name two commonly used bioreactors.

15. i) List the three steps involved in PCR.

    ii) Name the source organism of Taq polymerase. Explain its role in PCR.

16. i) Write the palindromic nucleotide sequence for the following DNA segment

    5′- GAATTC- 3′

    ii) Name the restriction endonuclease that recognizes this sequence

    iii) How are sticky ends produced? Mention their role.

5marks Questions

1. The development of bioreactors is required to produce large quantities of products.

    i) Give optimum growth conditions used in bioreactors.

    ii) Draw a well labeled diagram of simple stirred - tank bioreactor.

    iii) How does a simple stirred tank bioreactor differ from sparged stirred tank bioreactor?

2. i) Describe the characteristics a cloning vector must possess

    ii)Why DNA cannot pass through the cell membrane? Explain. How a bacterial cell is made competent to take up recombination DNA from the medium?

3. If a desired gene is identified in an organism for some experiments, explain the process of the following:

    i) Cutting this desired gene art specific location

    ii) Synthesis of multiple copies of this desired gene.

4. Name the source of *taq* polymerase. Explain the advantage of its use in biotechnology.

Chapter 12

Biotechnology and Its Applications

1mark Questions

1. Why do we use GM to create tailor made plants?
2. Name the technique based on the principle of antigen-antibody interaction used in detection of a virus (HIV).
3. What role does C-peptide play in human insulin.
4. Name a molecular diagnostic technique to detect the presence of a pathogen in its early stage of infection.
5. How does silencing f specific m RNA in RNA interference prevent parasitic infection?
6. The first transgenic cow produced human protein ñ enriched milk. Name the cow and the protein found in milk.
7. How are tobacco plants benefitted when nematode specific genes are introduced into them using certain vectors? Name the vectors used?
8. Development of a transgenic food crop may help in solving the problem of night blindness in the developing countries, name this crop plant
9. What is the role of GEAC? Check with reference to genetic engineering
10. What was the specialty of milk produced by transgenic cow Rosie?
11. The insulin produced using recombinant DNA technology is more advantageous than the insulin extracted from pancreas of slaughtered cattle and pigs. How?
12. State the principles on which ELISA works.
13. Name two pest resistant plants produced by using recombinant DNA technology.

2marks Questions

1. What is gene therapy? Name the first clinical case in which it was used.
2. What are the two methods for correcting ADA deficiency in a child?
3. Why do the toxic insecticidal proteins secreted by Bacillus thuringiensis kill the insect and not the bacteria itself?
4. Some crop plants are modified genetically by manipulating their genes. How are they made beneficial?
5. Some cotton plants grown by farmers are known as 'Bt cotton'.
   i) What does Bt stand for?
   ii) What is the advantage of this cotton plant?
6. The bacillus is not killed even after the application of insecticidal protein which is toxic. Comment.
7. Bt toxins are insect group specific. The toxin is coded by a gene named cry. How does the genes cry IAc differ from cry IAb?

8. Human insulin when synthesized in the body needs to be processed before it can act. Explain giving reasons/
9. Why proinsulin is called so? How is insulin different from it?
10. How can hereditary disease be corrected? Give example.
11. 'Industrialized nations are exploiting the bio resources of under industrialized nations'. Justify the statement with a suitable example
12. Does recombinant DNA help in detecting presence of mutane gene in cancer patients? How?
13. Describe RNA interference.
14. What are Genetically modified organisms (GMO's)? Give its advantages.
15. What is bio-piracy? State the initiative taken by Indian Parliament against it.
16. GEAC is one of the organizations set up by Indian Government. Write its full form. Give its two objectives
17. Why and how could we prevent bio-piracy?
18. How have transgenic animals proved beneficial in:
    i) Production of biological products
    ii) Chemical safety testing
19. Why is the introduction of genetically engineered lymphocytes into an ADA deficiency patient not a permanent cure? Suggest a possible permanent cure.

3marks questions

1. How did the process of RNA interference help to control the nematode from infecting the roots of tobacco plants?
2. Some multinational companies and other organisations are using bio resources for commercial benefits, without proper authentication and compensation to concerned authorities.
   (a)Give the term for this unauthorized act.
   (b)Suggest any two ways to get rid of this

3. A bacterium Bacillus thuringiensis produces a toxic protein named ë cry protein that is lethal to certain insects but not to bacterium

(a) Why this toxin does not kill the bacteria?

(b) What type of changes occurs in the gut of insects on consuming this protein?

(c) How man has exploited this protein for his benefit?

3. i) Explain the effect of deletion of the gene for ADA in an individual
   ii) How does the gene therapy help in this case?
4. Name the genes responsible for making Bt cotton plants resistant to bollworm attack. How do such plants attain resistance against bollworm attacks? Explain.
5. Plasmid is boon to biotechnology. Justify this statement quoting the production of human insulin as an example.

6. How did Eli Lily Company go about preparing the human insulin? How is this insulin different from the one produced by the functional human insulin gene?
7. What are cry proteins? Name an organism which produces it. How has man exploited this protein this benefit?
8. Name the host plant and its part that Meloidogyne incognita infects. Explain the role of Agrobacterium in the production of dsRNA in the host plant.

5marks Questions

1. Name the process involved in the production of nematode-resistant tobacco plants, using genetic engineering. Explain the strategy adopted to develop such plants.
2. What is ADA? Why is it essential for human body? Describe three method to cure ADA deficiency?
3. i) What is plasmid
   ii) Suggest a gene therapy for ADA deficiency? Is it a solution to this problem? Why is it not a permanent cure?
4. i) How is mature insulin different from proinsulin secreted by pancreas in humans

ii)Explain how was human functional insulin produced using rDNA technology?

iii)Why is the functional insulin produced considered better than he ones used earlier by diabetic patients?

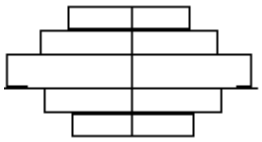
5. I) Why are certain cotton plants called Bt plants?
   ii) Explain how Bt cotton is resistant to pests.
6. What are transgenic animals? Explain four ways in which such animals can be beneficial for humans.

Chapter 13

Organisms and Populations

1mark Questions

1. Define diapause. Which organisms exhibit it?
2. How do bears escape from stressful time in winters?
3. Why are some organism called eurythermals and some other as stenohaline?
4. Mention any two activities of animals, which get cues from diurnal and seasonal variations in light intensity?
5. How do prickles help cactus survive in desert?
6. When and why do animals like snails go into aestivation?
7. In biological control method, one living organism is used against another to check its uncontrolled growth. Which kind of population interaction is involved in this?
8. Why many of the freshwater animals cannot live for long in seawater or vice versa?
9. Define homeostatics.
10. Write what do phytophagous insects feed on?
11. Why do some animals go into hibernation?
12. State Gause's competitive exclusion principle.
13. With which population growth model is the Verhulst Pearl equation associated?
14. Why are cattles and goats not seen browsing on Calotropis growing in the fields?
15. What type of growth status the following pyramid represents



16. How does camouflage help an insect?
17. Which are the factors responsible for the wide variety of habitat formed within each biome?
18. Name the interaction that happens between certain species of fig trees and wasps.
19. People living in higher altitudes have higher RBC count. Give reasons
20. Mention the unique features with respect to flowering and fruiting in bamboo species?
21. List two advantages that a mycorrhizal association provides to the plant.
22. Most living organisms cannot survive at temperatures above 45°c. How are some microbes able to live in habitats with temperature beyond 100°c?
23. "Abingdon tortoise in Galapagos islands became extinct within a decade after goats were introduced in that island". Can you cite the possible reason for the same?

2marks Questions

1. Differentiate between stenohaline and euryhaline organisms.
2. Some organisms suspend their metabolic activities to survive in unfavorable condition. Explain with the help of any four examples.
3. How is hibernation different from diapause?
4. Mention the attributes which a population has but not an individual organism.
5. What are the four ways through which the living organisms respond to abiotic factors?
6. Why small animals are rarely found in Polar Regions? Explain.
7. How does human body maintain constant temperatures both in summers and winters? Explain.
8. What are the four levels of biological organization with which ecology basically deals?
9. Differentiate between stenothermal and eurythermal organisms.
10. Why do clown fish and sea anemone pair up? What is this relationship called?
11. Kangaroo rats can survive in the absence of an external source of water. How do they adapt themselves to such conditions?
12. If a marine fish is placed in fresh water aquarium, will the fish be able to survive? Why?
13. Differentiate between commensalism and mutualism, with examples.
14. How does Monarchy butterfly defend itself from predators? Explain.
15. Explain Verhulst-pearl logistic Growth of population?
16. Explain brood parasitism with the help of an example?
17. i) what is r in the population equation $dN/dt=rN$
    ii) How does the increase and decrease in the value of r affect the population size?
18. In a pond, there were 40 lotus plants. After a year, the number rose to 56. Calculate birth rate of a lotus plant.

3marks questions

1. How does the shape of age pyramid reflect the growth status of a population?
2. Water is very essential for life. Write any three features both for plants and animals which enable them to survive in water scarce environment.
3. i) State how the constant internal environment is beneficial t \o organisms.
   ii) Explain any two alternatives by which organisms can overcome stressful external conditions.
4. i) Write the importance of measuring the size of a population in a habitat or an ecosystem.
   ii)Explain death rate in a population by taking a suitable example.
5. i) List any three ways of measuring population density of a habitat
   ii) Mention the essential information that can be obtained by studying the population density of an organism.
6. Why is predation required in community of different organisms
7. How will you measure population density in following cases?

(i) fish in a lake

(ii) tiger census in a national park

(iii) single huge banyan tree with large canopy

8. Darwin showed that even a slow growing animal like elephant could reach enormous number in absence of checks. With the help of your understanding of growth models, explain when is this possible? Why is this notion unrealistic?
9. Species facing competition might evolve mechanism that promotes co-existence rather than exclusion. Justify this statement in light of Gause's competitive exclusion principle, citing suitable examples

5marks Questions

1. What is altitude sickness? What its causes and symptoms? How does human body try to overcome altitude sickness?
2. List the different ways by which organisms cope or manage with abiotic stresses in nature. Explain any three ways.
3. Orchid flower, Ophrys co-evolves to maintain resemblance of its petal to female bee. Explain how and why does it do so?
4. i) Explain with the help of a graph the population growth curve when resources are (A) limiting (B) not limiting

   ii) Nature has a carrying capacity for a species. Explain.
5. Draw and explain a logistic curve for a population of density (N) at time (t) whose intrinsic rate of natural increase in® and carrying capacity(K).
6. i)What is an age pyramid? Draw an age pyramid of an expanding population.

   ii)Explain the birth rate and death rate in the population with the help of an example.
7. Study the table given below and answer the following questions:

Species A	Species B	Name of interaction
(+)	(+)	A
(-)	(-)	B
(+)	(-)	C
(-)	(0)	D

(+)= Beneficial interaction

(-)= Detrimental interaction

(0)= neutral interaction

Identify A,B,C, and D in the given table and explain any three of them with the help of an example each.

Chapter 14

Ecosystem

1mark Questions

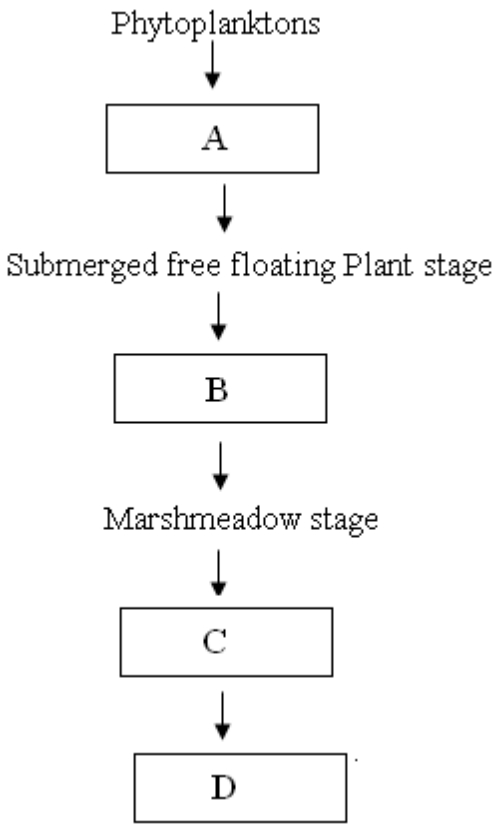
1. How is 'stratification' represented in a forest ecosystem?
2. How does the manmade ecosystem differ from the natural ecosystem?
3. Decomposition is faster if deteritus is rich in nitrogen and water soluble substance like sugars. When is the decomposition process slower?
4. In burnt out Forests and flooded lands succession takes place faster. Why?
5. Name the pioneers of primary succession in water
6. What is the difference between primary productivity and gross primary productivity?
7. What percentage of photosynthetically active radiation is captured by plants
8. Why are green algae not likely to be found in the deepest strata of the ocean?
9. What is secondary productivity?
10. What does standing crop of trophic level represent?
11. What is a detritus food chain made up of? How do they meet their energy and nutritional requirements?
12. Who are generally the pioneer species in a Xerarch succession and in a Hyararch succession?
13. Differentiate between standing state and standing crop in an ecosystem.
14. Differentiate between Sere and Seral communities
15. Sedimentary cycle is quite different from a gaseous cycle with respect to its reservoir. Bring out the difference.

2marks Questions

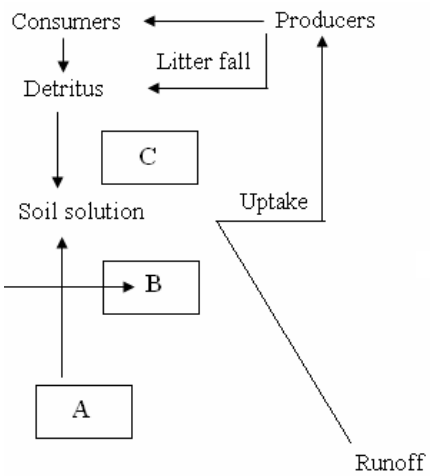
1. Differentiate between a detritivore and a decomposer giving an example of each.
2. What is the shape of pyramid of biomass in sea? Why?
3. It is possible that a species may occupy more than one trophic level in the same ecosystem at the same time. Explain with example.
4. Differentiate between primary succession and secondary succession. Which one occurs faster?
5. Construct a grazing food chain and detritus food chain using the following five links each, Earthworm, bird, snake, vulture, grass, grasshopper, frog, and decaying plant matter.
6. What is the effect on decomposition rate if :
   a) Detritus is rich in lignin and chitin
   b) Detritus is rich is nitrogen and sugars

7. Explain standing crop in an ecosystem. Draw a pyramid of biomass when a small standing crop of phytoplankton supports a large standing crop of zooplankton in the sea.

8. Name the two types of nutrient cycles existing in nature. Where are their reservoirs present? State the function of reservoirs?
9. Give an example of an ecological pyramid which is always upright. Justify your answer
10. What are the limitations of ecological pyramids?
11. Given below is the primary hydrarch succession. Bring out the missing sere stages in the process



12. Given below is a simplified model of phosphorus cycle. Write down the natural reservoir of phosphorus and also the processes that put in phosphorus to the soil.



3marks questions

1. Both carbon and phosphorus cycles are biogeochemical cycles but they differ in three aspects. List them.
2. a) What is primary productivity? Why does it vary in different types of ecosystems?
   b) All the primary productivity is not available to an herbivore, give reason.
3. Construct an ideal pyramid of energy, when 100000 J of sunlight is available. Label all its levels.
4. Ecosystems should carry a hefty price tag for its various services. Enlist six of them.
5. With the help of an example, differentiate between two types of pyramids of biomass.

5marks Questions

1. Detrivores like earthworm are involved in the process of decomposition of dead plants and animals. Describe the different steps involved in the process of decomposition.
2. a) Explain secondary productivity.
   b) Describe how do oxygen and chemical composition of detritus control decomposition?
3. a) Differentaite between primary and secondary ecological successions.

b) Explain the different steps of xerach succession occurring in nature.

4. Explain how does a primary succession start on a bare rock and reach a climax community.
5. a) Draw a pyramid of numbers of a situation, where a large population of insects feed upon a very big tree. The insects in turn, are eaten by small birds which in turn are fed upon by big birds.

b) Differentiate giving reasons, between the pyramid of biomass of the above situation and the pyramid of numbers that you have drawn.

6. Carbon cycle in nature is a biochemical event. Explain.

7. What does the term standing state of soil signify? How are the nutrients recycled in the ecosystem? Write a cyclic account of carbon movement in nature.

Chapter 15

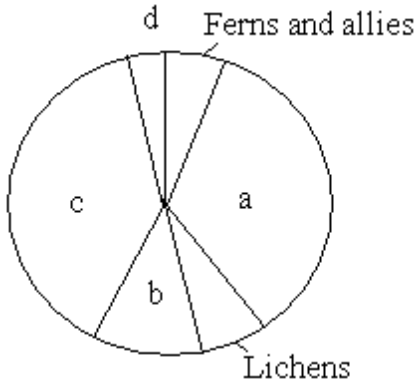
Biodiversity and Conservation

1mark Questions

1. Habitat loss and fragmentation has caused severe damage to a particular type of ecosystem. Name it
2. Why is tropical environment able to support greater species diversity?
3. What trend is observed in respect of species diversity when we move from equator to poles?
4. Eichhorniacrassipes is an alien hydrophyte introduced in India. Mention the problem posed by this plant.
5. Write the importance cryopreservation in conservation of diversity.
6. Mention one advantage of pollen bank? How is pollen stored in a bank?
7. Which region is considered as the one with highest biodiversity on earth? What is the name given to such region.forests?
8. What is the reason for genetic variation shown by medicinal plant Rauwolfiavomitoria?
9. Explain co-extinction with a suitable example.

2marks Questions

1. List causes of biodiversity loss.
2. a) India has more than 50000 different strains of rice and 1000 varieties of mangoes.
   c) Western Ghats have a greater Amphibian diversity than the Eastern Ghats.
   What do you infer from the above two statements?
3. Identify a,b,c and d in the above pie diagram showing global biodiversity of plants.



4. Amazon forests are regarded are "Lungs of the Planet". Why?
5. Would the extinction of one insect pollinator affect the ecosystem? Explain
6. What is meant by alien species invasion? Name one plant and one animal alien species that are threat to our Indian native species.

7. Explain why there is more species biodiversity in tropical latitudes than in temperate ones?
8. How is biodiversity useful in modern agriculture?
9. Differentiate between in situ and ex situ approaches of conservation of biodiversity.
10. Why certain regions have been declared as biodiversity hot spots by environmentalists of the world? Name any two spot regions of India.

3marks questions

1. Hot spots are the regions of exceptionally high biodiversity. But they have become regions of accidental habitat loss too. Name the three hot spots of our country. Why are they called Hot spot?
2. Explain rivet popper hypothesis. Name the ecologist who proposed it.
3. Why tropics show greatest levels of species diversity. Explain with examples.
4. Why are:
   i) Alien species invasion and
   ii) Loss of habitat and fragmentation considered to be the major cause of loss of biodiversity? Explain with examples.
5. Why is the sobriquet 'The Evil Quartet' used in context of biodiversity? Name the members of this quartet. Why do we grieve for the genes when a species is lost?
6. White Bengal tigers are protected in special settings in zoological parks. Tiger reserves are maintained in Western Ghats.
   i) How do these two approaches differ from each other? Mention the advantages of each one
   ii) What is the significance of cryopreservation technique?
7. Would Western Ghats ecosystems be less functional if one of its tree frogspecies is lost forever? Substantiate your answer in the light of hypothesisproposed by Paul Ehrlich.

5marks Questions

1. i) Explain the narrow utilarian broadly utilarian and ethical arguments in favor of conservation of biodiversity.
   ii) How is designation of certain areas as hot spots a step towards biodiversity conservation? Name two such hot spots.

Chapter 16

Environmental Issues

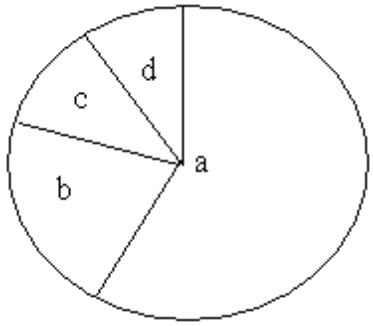
1 mark questions

1. State the cause of accelerated eutrophication.
2. Why is Eichhorniacrassipes nick named as terror of Bengal?
3. A factory drains its waste water into a nearby lake. What will be its effect on the lake after a few days?
4. Jhum cultivation has been in practice from earlier days, but its considered more problematic these days. Why?
5. A radiation causes ageing of skin, skin cancer , and inflamation of cornea called snow blindness. It also damages DNA. Name the radiation.
6. Name two colloidal impurities in urban wastewater.
7. Name the world's most problematic aquatic weed. What is the nature of the water body in which the weeds grow abundantly?
8. For what purpose Montreal Protocol was signed?
9. Why is Gambusia introduced into drains and ponds?
10. How is snow blindness caused in humans?
11. Name the greenhouse gases produced by anaerobic microbes.
12. What is the noise level that can cause permanent impairment of hearing ability of human beings?
13. The birds egg shells become thinner in an area where there is an excess application of pesticides. Comment
14. Motor vehicles with catalytic converter should use unleaded petrol. Why?

2marks Questions

1. Landfills are not much a solution for getting rid of solid wastes. Why?
2. What are e-wastes? Why are they creating more problems in developing countries in comparison to developed countries?
3. Name two metals used in catalytic convertor. How do they help in keeping the environment clean?
4. W ater logging and salinity are some of the problems that have come in the wake of Green revolution. How does water logging create problems of salinity?
5. What is polylblend? Why did the plastic manufactures think of producing it? Write its usefulness?
6. Mention the three causes of air pollution in metro cities? Write any three ways, in which it can be reduced.
7. A crane had DDT level as 5ppm in its body. What would happen to the population of such birds? Explain.

8. Thermal power plants are inevitable in an industrial and densely populated country like ours. What harm they do to the environment? What precautions could be taken?
9. Vehicles are fitted with catalytic converters. Give reason
10. What is the relationship between BOD, mcro-organisms and amount of bio-degradable matter?
11. It was observed that some of the aquatic birds' population has been declining. On analysis of the water in their habitat, high concentration of DDT was found
    a) What caused the decline is birds' population?
    b) What is this phenomenon known as?
12. Electrostatic precipitator can remove over 99% particulate matter present in exhaust from a thermal power plant. How?
13. Refrigerants are considered to be a necessity in modern living, but are said to be responsible for ozone holes detected in Antarctica. Justify.
14. How does global warming pose a threat to the coastal areas of the earth? Explain.
15. Mention the greenhouse gases & their proportion in the pie diagram given below.

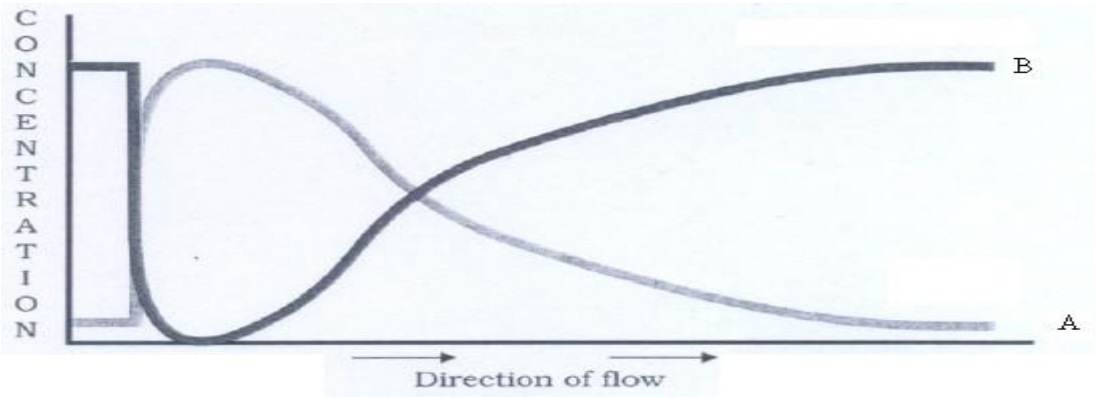


16. A farmer saw water in a pond turned green & with dead fishes.

a) What is the reason for the death of fishes?

b) Name the phenomenon that leads to the death of fishes

17. Dumping waste in landfills is not a real solution for disposing wastes. Why?
18. In the graph what does A & B depict?



3marks questions

1. A few residents in your locality, for business gains, have established small scale industrial/commercial activities such as pathological labs and fabric dyeing centres without obtaining 'No objection certificates' from municipal authorities? Give any three reasons in support of your answer.
2. Enlist four harmful effects caused to the humans living in areas having polluted air. Suggest two measures to reduce air pollution
3. Why should the spraying of DDT as insecticide on vegetable crops be banned? Explain.
4. Deforestation is creating a lot of problems in the environment. List the consequences of deforestation.
5. Many coastal areas may get submerged due to the environmental changes taking place at the present rate. Give the cause, and state two measures to check it.
6. Integrated organic forming is a cyclical zero waste procedure. Justify.
7. i) State the consequence if the electrostatic precipitator of a thermal plant fails to function.
   ii) Mention any four methods by which the vehicular air pollution can be controlled.
8. How does algal bloom cause eutrophication of a water body? Name the weed that can grow in such eutrophic lake.
9. Eutrophication is the natural ageing of lake. Explain.
10. Ecosan toilets are a hygienic, efficient and cost effective solution to the disposal of human wastes. Justify.
11. People have been actively participating in the efforts for the conservation of forests.
    i) Name the award instituted in respect of Amrita Devi to promote such efforts.
    ii) Name the movement launched to protect the trees by hugging them.
    iii) Name the step Government of India has undertaken in 1980ís to work closely with the local communities for protecting and managing forests.
12. A factory drains its waste water into the nearby lake. It has caused algal bloom.
    i) How was the algal bloom caused
    ii) What would be the consequences
    iii) Name the phenomenon that caused it.

5marks Questions

1. i) Why are catalytic convertors recommended for vehicles?
   ii) Why should such vehicles use only unleaded petrol?
   iii) Why is CNG preferred to diesel as a fuel in vehicle?
2. What are the contribution of Ahmed Khan in Bangalore and Ramesh Chandra Dagar in Sonipat?
3. Pollutant released due to human activities (like effluents from industries and homes) can radically accelerate the ageing process of the water body
   i. Explain how this process occurs during natural ageing of lake.

ii. Give the term used for accelerated ageing of water bodies.

iii. Also givethe term used for the natural ageing of lake.

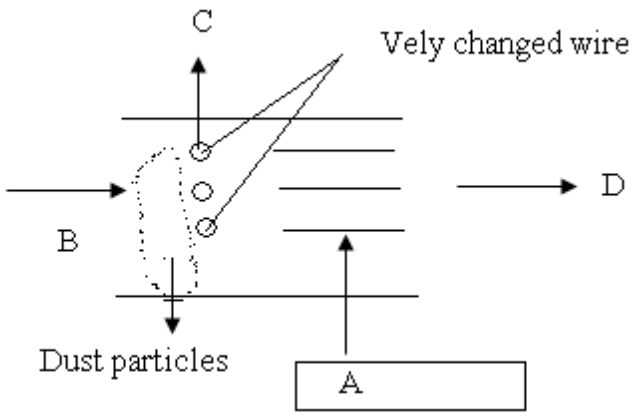
4. i) Expand CFC.

   ii) CFCs are a part of greenhouse gases. Name the other gases.

   iii) Explain the major harms caused by these gases

   iv) Mention the consequences of the degradation of ozone.

5. Observe the following figure carefully and answer the questions that follow:



i) Label the parts A, B, C & D

ii) What are the steps involved in the removal of particulate matter?

iii) How is it different from scrubber?

Value Based Questions

1. Megha attended a seminar on "cleanliness for health life" in her school, where importance of cleanliness was emphasized for disease free life. Megha came home and told her sister about t. Give some points, which you feel will help Megha to convince her sister more effectively in explaining the importance of cleanliness.
2. Joy loves to play football and was selected as captain of the school team for the district level tournament. He also does social work. He attended a blood donation camp to donate blood and came to know that he was HIV positive. He lost interest in games and refused to play or study. He started counting his days. He remained absent from school for a long time. The Biology teacher visited his house and counseled him. Joy was back at school and also played the tournament.

   a) What sense of responsibility did the Biology teacher exhibit?

   b) A person detected to be HIV positive should be isolated in the society? Do you agree? Why/ Why not?

   c) How is AIDS not spread?

3. Pooja's grandmother blames her mother for giving birth to three daughters and wants another marriage of her son. Is it right to blame a female for sex determination? Justify your answer.
4. Alok was rejected for driving license as it was found that he could not distinguish between red and green color. What would be the impact of his color blindness on his driving on road?
5. Sunita finds that after few periods of teaching classroom is littered with many small pieces of papers. Next day she delivered a speech in assembly-"if a paper is torn a branch of tree is being destroyed." Do you agree with Sunita? Give reasons
6. Municipal Corporation has deputed personnel to check for mosquito breeding in your school.
   a) Which are the places they should check for mosquitoes and ther e larvae?
   b) Name to diseases which are spread by mosquitoes.
   c) Name any two biological agents which can be used to control mosquitoes
7. Inspector Dubey could find only few hair strands from crime scene. He wants to proceed for DNA fingerprinting but the amount of DNA is very less. In your opinion what could be the solution to this problem? Write the basic steps of this technique?
8. Anil and
9. Sunil are partners and established a factory. After a few months electrostatic precipitator became out of order. Sunil wanted to replace it but Anil expressed the view that they have no effect of it on productivity as well as income; therefore they should not waste money to replace it.
   (a)Out of these partners whom do you support and why?
   (b) Suggest any two measures to stop such negligence.
10. A few months ago the people of Ramgarh started a bad practice of disposing their waste in the pond of village which was earlier source of drinking water. It resulted in deterioration of quality of water and fish mortality.

(a) What changes do you think have taken place in pond? Name such condition.

(b) What measure will you take to stop villagers for such practices as well as to improve the condition?