CEP Phase-2 (2024-25)
Class : 12th
Subject : Biology
LEP Simplified Study Material

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3.	Vanita	GSSS Bassi Pathana	1 marks chapter 8-13
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Checked and reviewed by: Mrs. Rajveer kaur, Lec. bio, GSSS Kotla Bajwara, FGS

Dr.Sapna, Lec. Bio, GSSS(B), Mandi Gobindgarh, FGS

Under guidance of: Mrs Puneet Kaur, Lecturer biology,DM biology, FGS)

Supervised by: Mrs Jasvinder Kaur, Assistant Director (SCERT)

Chapter 1: Sexual Reproduction in Flowering Plants

- Sexual reproduction in plants is the process by which new plants are produced through the formation and fusion of male and female gametes. This type of reproduction involves the union of haploid (n) gametes, resulting in a diploid (2n) zygote that develops into a new plant.
- Plants reproduce sexually by producing specialized reproductive structures. These structures are classified into male (stamens) and female (carpels) parts in flowering plants
- Male Gamete Formation :Inside the anther, microspore mother cells (2n) undergo meiosis to produce four haploid microspores (n) by process called spermatogenesis.
- Within the ovary are **ovules**, each of which contains a **megasporocyte** (2n).A megasporocyte undergoes meiosis, producing **four haploid megaspores**, out of which typically only one survives by process called oogenesis.
- The surviving megaspore divides mitotically to form a structure called the **embryo sac** (female gametophyte), which contains eight nuclei.
- Pollination: Pollination is the transfer of pollen grains from the anther (male reproductive part) to the stigma (female reproductive part) of a flower. This is a crucial step in sexual reproduction. There are two main types of pollination:Self-Pollination and Cross-Pollination

- Fertilization : After successful pollination, the pollen grain lands on a compatible stigma, initiating the next steps for fertilization: a)**Pollen Tube Formation b) Movement of the Generative Cell c) Double fertilization**
- **Double Fertilization:** In flowering plants, fertilization involves two key events:
    - One sperm cell fuses with the egg cell to form a **zygote** (2n).
    - The other sperm cell fuses with the two polar nuclei in the central cell, forming a **triploid endosperm** (3n). This provides nutrition to the developing embryo.

1. **Zygote Development:** The fertilized egg (zygote) undergoes mitotic divisions to form the embryonic structure.
2. **Seed Formation:** The ovule becomes a seed, which consists of:
    - **Embryo:** The developing plant.
    - **Endosperm:** A food store that nourishes the embryo during germination.
    - **Seed Coat:** A protective outer layer that protects the embryo and seeds from external harm.
3. **Fruit Formation:** In angiosperms, the ovary develops into a fruit after fertilization. The fruit encloses and protects the seeds and aids in seed dispersal by wind, water, or animals.

Chapter 2: Human Reproduction

Male Reproductive System: The male reproductive system is responsible for producing and delivering sperm for fertilization. Its main components are:

- **Testes**: These are the male gonads responsible for producing sperm and testosterone.
- **Epididymis**: A coiled tube where sperm mature and are stored.
- **Vas Deferens**: The duct that carries sperm from the epididymis to the urethra.
- **Seminal Vesicles and Prostate Gland**: These secrete fluid that mixes with sperm to form semen.
- **Urethra**: A canal that carries semen and urine out of the body through the penis.
- **Penis**: The organ involved in copulation, enabling the transfer of semen into the female reproductive tract.

2. Female Reproductive System

The female reproductive system supports the development of eggs (ova), fertilization, pregnancy, and childbirth. Key components include:

- **Ovaries**: The female gonads that produce eggs and secrete hormones like estrogen and progesterone.
- **Fallopian Tubes**: Ducts that transport eggs from the ovaries to the uterus; the site of fertilization.
- **Uterus**: The muscular organ where the fertilized egg implants and develops into a fetus during pregnancy.

3. Menstrual Cycle : The menstrual cycle regulates ovulation and prepares the body for pregnancy. It consists of:

1. **Menstrual Phase**: Shedding of the uterine lining through menstruation.
2. **Follicular Phase**: Development of follicles in the ovaries and preparation of the uterine lining.
3. **Ovulation**: The release of a mature egg from the ovary around day 14 of the cycle.
4. **Luteal Phase**: Formation of the corpus luteum, which secretes progesterone to support pregnancy if fertilization occurs.

4. Fertilization and Pregnancy

- **Fertilization** occurs when a sperm meets an ovum in the Fallopian tube.
- The fertilized egg implants itself in the uterine wall, beginning pregnancy.
- Pregnancy involves the development of the embryo and foetus inside the uterus until childbirth.

5. Parturition (Childbirth): The processof giving birth is called parturition.

Chapter 3: Reproductive Health

- Methods to control birth rate 1. temporary methods 2 permanent methods 3 medical termination of pregnancy.
- Permanent methods include vasectomy tubectomy. Sexually transmitted diseases aregonorrhoea, syphilis, genital herpes, hepatitis B, HIV
- Assisted reproductive techniques(ART) are: test tube baby, gamete intrafallopian transfer GIFT, intracytoplasmic sperm injection ICSI, artificial insemination
- technique AITIntrauterine transfer IUT.

Chapter 4 Principles of Inheritance and Variation

- Heredity is a process of transmission of traits from parents to their offspring.
- G.J.Mendal is known as father of genetics.
- Mendel’s laws law of dominance:The dominant allele masks the effect of recessive allele.
- Law of segregation of genes:Individuals possess 2 alleles of a gene and each alleles separate or segregates at the time of meiosis.(1:2:1)
- Law of independent assortment:It states that alleles for separate traits are passed independently from parents to offspring.(9:3:3:1)
- Test cross is a cross between an individual of unknown genotype add an individual which is homozygous for recessive characters.(1:1)
- Backcross is a genetic cross between a hybrid Organism and one of the original parent.(1:1)
- Incomplete dominance: when the dominant allele is not completely dominant over recessive allele and F1 hybrid forms the intermediate of 2 parents.
- Multiple alleles:More than 2 alternate forms of a gene in a population are called multiple alleles For example - 3 alleles of ABO blood groups.
- Linkage is the tendency of genes present in the same chromosome to stay together.
- Sex determination is a system that determines the development of sexual characteristics in an organisms.

- Mutation is an inheritable change in the structure of gene or chromosome or a change in chromosome number.
- Pedigree analysis are charts used to understand the inheritance pattern in a family.
- Genetic disorders are of 2 types: mendelian disorders and chromosomaldisorders.
- Mendelian disorders are based on mutation in single gene example-haemophilia, sickle cell anaemia, colour blindness, phenylketonuria, cystic fibrosis.
- Chromosomal disorders are caused due to absence or excess or abnormal arrangement of chromosomes. Example- Down syndrome due to extra copy of 21 chromosomes.

Chapter 5 Molecular Basis of Inheritance

- Deoxyribonucleic acid (DNA):It acts as the genetic material in all organisms.
- DNA consist of 3 components- deoxyribose sugar, nitrogenous base - purine or pyrimidine, phosphate groups.
- Purines are adenine and guanine. Pyrimidines are of 3 types- thymine, cytosine and uracil.
- central dogma is the flow of genetic information occur in biological system. DNA replicates and get converted into messenger RNA via transcription and is translated to form proteins.
- DNA replication: it is a process of producing 2 identical copies of DNA from the single DNA molecule.
- Transcription: it is a process of formation of RNA from DNA before the protein synthesis occurs.
- Translation: this is the process of gene expression or protein synthesis that occurs in cytoplasm
- Genetic code is the set of three nucleotides by which information coded in genetic material is translated into proteins in living cells.
- Regulation of gene expression: all the genes in living cells are not active all the time.It becomes active when it is needed. This expression is controlled by the genes at various level- transcription level, processing level and translation level.
- Lac operon consist of structural genes, operator genes, promoter genes, regulator genes and repressor genes.Lactose acts as an inducer in lac operon.
- Human genome project: it is a comprehensive international effort started in the year 1990 and completed in 2013 to map the human genome.The human genome contains 3164.7 million nucleotide basis.Humans have 30,000 genes.
- DNA fingerprinting is a technique used for identification of individuals on the basis of their respective DNA profiles.

Chapter 6 Evolution

- Earth formed 4.5 billion years back. There was no atmosphere on early earth.
- Oparinand Haldane theory of origin of life given by Oparin and Haldane.They proposed that formation of life was preceded by chemical evolution.
- Urey and Miller experiment: Miller and Urey by creating conditions of primitive earth produced amino acids and fatty acids in the laboratory.
- Theory of origin of species by natural selection was given by Charles Darwin.He concluded that existing life forms share similarities with life forms that existed millions of years ago.
- Paleontological evidences are based on study of fossils.
- Homologous organs are similar in structure but different in function.
- Analogous organs are similar in function but different in structure and origin.
- Connecting links are the organisms with characters of 2 different group.

- Vestigial organs are the organs in the body which have become functionless with the passage of time.
- Atavism is the reappearance of ancestralorgans in some individuals
- Embryological evidences are the comparative study of embryos of various animal groups showing similarities between them.
- Divergent evolution shows how new species diverged from a single ancestral form.
- Convergent evolution shows development of similar functional structures in unrelated groups of organisms.
- Hardy Weinberg principle states that allele frequencies in a population are stable and are constant from generation to generation. $(p+q)^2=p^2+q^2+2pq=1$.

Chapter 7 Human Health and Diseases

- Diseases can be infectious or non-infectious.
- Diseases caused by bacteria:typhoid fever-causal organismsalmonella typhi,pneumonia- causal organism streptococcus pneumonia
- Diseases caused by virus-common cold,causal organism -rhinovirus.
- Diseases caused by protozoa – malaria caused byPlasmodium vivax,Amoebiasis caused by antamoebahistolytica.
- Life cycle of plasmodium consists of sporozoites, multiplication of parasites, attack on RBC's, release of toxic substance called hemozoin.
- Plasmodium requires 2 host to complete the life cycle human host and female anopheles mosquito.
- Diseases caused by worms -ascariasis by Ascaris, elephantiasis by Whucheriabancrofti.
- Diseases caused by Fungi- ringworm byMicrosporum, Trichophyton,Epidermophyton.
- Immunity is the ability to fight against diseases.It is of 2 types: innate immunity and acquired immunity.
- Humoral immune system: it involves production of antibodies.
- Cell mediated immune system does not involve antibodies but involves activation of phagocytes, Cytotoxic t lymphocytes and release of cytokines.
- Types of acquired immunity: active immunity and passive immunity.
- Vaccination is introduction of antigenic proteins of pathogens into the host body to induce the host immune system to produce antibodies against antigens.
- Allergies are the hyper response of immune system to certain antigens.
- Human body consist of lymphoid organs- tissues cells, antibodies as immune system.
- Primary lymphoid organs are bone marrow and thymus.
- Secondary lymphoid organs are spleen and lymph nodes.
- AIDS (acquired immunodeficiency syndrome) caused by human immunodeficiency virus HIV.
- Tumours are of 2 types benign tumour and malignant tumour.

Chapter 8 Microbes in Human Welfare

- **Microbes in household products**- Lactobacillus is found in curd.The process of formation of alcohol from sugar is known as fermentation.
- **Microbes in industrial products**-Beverages and antibiotics are common products obtained from microbes.Saccharomycescerevisiae commonly known as Brewers' Yeast.Antibiotics are produced using microbes.Aspergillus Niger is used to produce citric acid.

- **Microbes in sewage treatment**: Primary treatment of sewage involves removal of small and large particles by filtration and sedimentation.The leftover effluent is taken for secondary treatment.It reduces the biological oxygen demand (BOD). Microbes in gobar gas or biogas fermentation are methanogens or methanogenic bacteria.
- **Microbes as biocontrol agents** are used to control plant diseases and pests.Bacillus thuringienesis(Bt) is a bacterium used as biocontrol agent against insects and pests.Microbes are used as biofertilizers to enrich the nutrient quality of soil . Rizobium bacteria found in leguminous plants helps in absorption of nitrogen by plants.Baculoviruses are used to attack insects and arthropods.

Chapter 9 : Biotechnology Principles and Processes

- Principles of biotechnology includes genetic engineering and maintenance of sterile environment in the process.
- Tools for recombinant DNA technology are 1) enzymes:Restriction enzymes,Ligases 2) Vectors:Plasmids and bacteriophages 3) Host organisms include bacteria, fungi and animal cells.
- Process of recombinant DNA technology includes
  1. isolation of genetic material
  2. restriction digestion of isolate DNA and joining via ligases.
  3. amplification of gene of interest using PCR by Taq polymerase
  4. insertion of recombinant DNA into host cell or Organism
  5. expression of desired protein.
- Bioreactors are used to produce large quantity quantities of recombinant proteins. Bioreactors are of twotypes :
  1. Stirring type bioreactor.
  2. Spargertype bioreactor.
- The processes and methods involved in the separation and purification of desired product is called Down streaming process.

Chapter 10 : Biotechnology and its applications

- In agriculture, food is enriched with nutritional value example golden rice.
- Pest resistant plants example BT cotton
- Increased yield of plant by RNA interference technology.
- In medicines: gene therapy and enzyme replacement therapy is used to treat adenosine deaminase deficiency (ADA).
- Molecular diagnosis such as ELISA, PCR to detect HIV in AIDS patients.
- Transgenic animals are the animals with manipulated DNA.
- Genetic Engineering Approval Committee (GEAC) a committee set by Indian government regarding genetically modified organisms and GM research.
- Bio viruses is use of bio resources by commercial and MNC's without proper authorization and permission from the concerned people and countries.

Chapter 11 : Organisms and Population

- Ecology is the branch of science which deals with the relationship between Organism and environment.
- Population attributesincludes birth rate, death rate, age distribution, sex ratio.

- Ecological Pyramids: Shape of pyramid reflects the status of population . It can be expanding stable and declining.
- Population growth forms are of 2 types:Sigmoid or s shaped and J shaped growth form population.
- Intraspecific interactions are between the same species whereas interspecific interactions between different species.
- **Predation** is an interspecific interaction where predator consumes the prey.**Competition** occurs between closely related species for food and shelter .**Parasitism** is an interaction where one species is dependent on the other for food.
- **Commensalism**where one species benefit the other species and the other one is neither harmed nor benefited. **Mutualism** is the interaction where both the species will benefit each other example mycorrhiza,lichens.
- **Ammensalism** is a relationship in which one species is harmed while other interacting species is neither harmed nor benefited.

Chapter 12 Ecosystem

- Ecosystem is the functional unit of nature in which living organisms interact with each other as well as with their environment.
- Biosphere is a global ecosystem consisting of all the local ecosystems on the earth.
- Types of ecosystem: Aquatic ecosystem- pond, lake, river etc.
- Terrestrial ecosystem: Forest, grassland, desert etc.
- Ecological pyramids- an ecological pyramid is a representation in a graphical manner of the relationship between different organisms in an ecosystem.
- Types of ecological pyramids:Pyramids of number, Pyramids of biomass,Pyramids of energy.
- 10% law of energy states that during transfer of food energy from one trophic level to another only 10% is stored at the higher trophic level and remaining 90% is lost in respiration in the form of heat.
- Primary productivity is the amount of biomass produced per unit area in a given time period by plants.
- Gross primary productivity of an ecosystem is the rate of production of organic matter during photosynthesis.
- Net primary productivity is gross primary productivity minus respiration loss.
  NPP= GPP- Respiration.
- secondary productivity is defined as rate of formation of new organic matter of consumers.
- Decomposition involves fragmentation, leaching, catabolism,humification and mineralization.

Chapter 13 Biodiversity and its Conservation

- Biodiversity can be defined as the vast diversity of species and varieties of all the life forms existing on earth.
- Levels of biodiversity : 1. Genetic diversity number 2. Species diversity 3.Community and ecosystem diversity.
- Community and ecosystem diversity has it 3 types: a) alpha diversity 2) beta diversity 3) gamma diversity.
- India as a mega diversity region:It has 10 biogeographical regions, It has 89 national parks, 492 wildlife sanctuaries, 14 biosphere reserves, 27 tiger reserves.
- Threat to biodiversity: a) Habitat loss and fragmentation b) over exploitation c)alien species invasions 4) Co extinctions
- Importance of biodiversity: for food, fibres, sports and recreation, cultural value.

- Ecosystem services are source of fats and oils, source of drug and medicine, scientific value ethical requirements.
- Conservation of biodiversity: For narrow utilitarian- for food, firewood, fibres, construction material.
- Broadly utilitarian for Amazon forest produce 20% of oxygen, for pollinators.
- Ethical conservation: 2 type of conservation strategies- a) in situ conservation- in order to protect the threatened species in their own habitat such as national parks wildlife sanctuaries, biosphere reserves, sacred groves, wetlands.
- Ex situ conservation: means of conservation away from their natural habitats or off site collection such as Botanical Gardens, seed banks, field bank, cryopreservation, zoological gardens, aquarium.
- Hotspots of biodiversity are the regions of rich biodiversity.34 terrestrial hot spots have been identified throughout the world. Three of these hot spots- western ghats and Sri Lanka, Indo Burma and Himalayas.

Chapter 1:Sexual Reproduction in Flowering Plants

(one mark questions)

1.The process of pollen transfer from the anther to the stigma is called:

a) Germination b) Pollination c) Fertilization d) Reproduction

2. The structure that helps in the protection of the ovules in a flower is:

a) Sepal b) Petal c) Ovary d) Style

3.Which part of the flower produces ovules?

a) Anther b) Ovary c) Style d) Stigma

4. In the embryo of a typical dicot and a Grass true homologous structures are:

a) Coleorhiza and coleoptile b) Coleoptile and scutellum

c) cotyledon and scutellum d) hypocotyl and radicle.

Fill in the blanks

5.The transfer of pollen grains from the anther to the stigma is called _____.

6 The structure that protects the ovule and later develops into the fruit is the _____.

7. The male gametes in angiosperms are produced by the _____.

8. The process of fusion of male and female gametes is known as _____.

9. _____ is the most common type of pollination in angiosperms.

True / False

10. In double fertilization, one sperm nucleus fuses with the egg cell, and the other sperm nucleus fuses with the polar nuclei.

11. The fertilization in plants occurs when the pollen grain reaches the ovary.

(2 mark questions)

1. What is double fertilization ?

2. Define apomixis ?

3. Write the role of tapetum ?

4. Why is an apple called false fruit ?

(five mark question)

1.Explain the 7- celled 8 - nucleate structure of female gametophyte.

2. Draw the diagram of the ovule.

3. Explain the development of megasporogenesis.

4. Explain the process of microsporogenesis.

Answer Key: 1.b 2.c 3.b 4. C 5.pollination 6.ovary 7.generative cell 8. fertilisation 9. Entomophilly

10. true 11. false

Chapter 2- (Human Reproduction)

(one mark questions)

1.The male reproductive organ that produces sperm is:
a) Ovary b) Uterus c) Testis d) Vas deferens
2.In human females, ovulation occurs around:
a) 14th day of menstrual cycle b) 7th day of menstrual cycle
c) 21st day of menstrual cycle d) 28th day of menstrual cycle
3.The fertilization of an ovum takes place in:
a) Uterus b) Ovary c) Fallopian tube d) Vagina
4. The vas deference receives duct from the seminal vesicle and open into urethra as:

a) Epididymis b) ejaculatory duct c)Efferent ductule d) ureter

Fill in the blanks

5.The process of release of a mature egg from the ovary is called _____.
6. The fertilized egg is called a _____.
7. The placenta is connected to the embryo by the _____.
8.The hormone responsible for milk ejection during lactation is _____.
9. Spermatogenesis occurs in the _____.

True/ false

10. Ovulation occurs around the 14th day of the menstrual cycle in humans.
11. The sperm fertilizes the egg in the fallopian tube.
12.The male reproductive system in humans includes the uterus and the vagina.
13.The placenta is responsible for providing nutrients and oxygen to the embryo.

(Two mark questions)

1.Write two major functions of testis ?
2.Define spermiogenesis and spermiation ?
3.What are leydig cells and write their function ?
4.Name the functions of 1) corpus luteum 2) endometrium 3) acrosome

(five mark questions)

1.What is spermatogenesis? Describe the process of spermatogenesis.
2.Explain the process of oogenesis.
3.Draw the diagram of male reproductive system. Draw the diagram of the female reproductive system.
4.Explain human female menstrual cycle.
5.Describe the physical and chemical events of fertilization.
Answer Key: 1.c 2. b 3. c 4. b 5. ovulation 6. zygote 7. Umbilical cord 8.prolactin 9. Seminiferous tubules 10. true 11. true 12. false 13. true

Chapter 3- (Reproductive Health)

1.Contraceptive methods are used to:
a) Prevent fertilization b) Increase fertility
c) Decrease the number of offspring d) Prevent infections
2.Which of the following is a natural contraceptive method?
a) Condoms b) Intrauterine devices (IUDs) c) Periodic abstinence d) Contraceptive pills
3.The permanent method of contraception in females is:
a) Vasectomy b) Tubectomy c) Intrauterine device d) Condom

4.Which of the following is a barrier contraceptive method?
a) Vasectomy b) IUD c) Condom d) Oral pills
5.The IUD method of contraception prevents:
a) Sperm movement b) Ovulation c) Uterine implantation d) Hormone production

6. Condoms are one of the most popular contraceptive because of the following reason:

a) these are effective barriers for insemination b) they do not interfere with coitall act

c) they help in reducing the risk of STDs d) all of the above.

(Fill in the blanks)
7. A method to prevent fertilization by using physical barriers is called the _____.
8. The technique of transfer of an ovum fertilized outside the body into the uterus is called _____.
9. _____ is the surgical method of contraception in males.
10. The most effective method to prevent sexually transmitted diseases is the use of _____.

(True/False)
11. In vitro fertilization (IVF) is a form of assisted reproductive technology.

(Two mark questions)
1). Expand ZIFT and IVF ?
2) Is the use of contraceptives justified ? give a reason.
3) What is population explosion ?
4) What is amniocentesis? Discuss Its Misuse ?
5) What is MTP ?
6) What is the role of CuT ?
7) What are oral pills ?
8) Is sex education is necessary in society if so why ?
9) What measures should be taken to prevent STDS ?

Answer Key: 1. a 2. c 3. b 4. C 5.c 6. d 7. Surgical methods 8.IVF 9. vasectomy 10. condom 11.true

Chapter 4- (Principles of Inheritance and variation)

1.The law of segregation was proposed by:
a) Mendel b) Darwin c) Watson and Crick d) Lamarck
2.The phenomenon where one gene affects the expression of another gene is called:
a) Epistasis b) Codominance c) Incomplete dominance d) Pleiotropy
3.The ratio of phenotypes in a dihybrid cross of two heterozygous individuals is:
a) 3:1 b) 9:3:3:1 c) 1:1 d) 1:2:1
4. In a dihybrid cross if you get 9:3:3:1 it denotes that:
a) the alleles of two geans are interacting with each other b) it is a multigenic inheritance
c) it is a case of multiple Allelism d) the alleles of two geans are segregating independently.

(Fill in the blanks)
5.The phenotypic ratio of a dihybrid cross in Mendelâs experiment is _____.
6. Haemophilia is an example of a _____ linked disorder.
7. In a monohybrid cross, the genotypic ratio in F2 generation is _____.
8. _____ coined the term gene.

(True/ false)

9.In incomplete dominance, the heterozygous phenotype is an intermediate of the two homozygous phenotypes.
10..A gene mutation can result in a change in the genetic code.
11. Crossing over occurs during the prophase of meiosis I.
12.Each parent contributes one allele for a given trait in offspring.

(Two mark questions)

1) What is incomplete dominance? give one example
2) Define and design a test cross
3) Mention any two autosomal genetic disorders with symptoms.
4) Difference between monohybrid and dihybrid cross ?
5) Why is Mendel considered as the father of genetics ?
6) A haemophilic carrier female marries a normal man with the help of punnett square show the type of progeny formed ?
7) What will be the blood group of following genotypes ?1) $I^A I^B$ b) I^A i c) I^B i. D) i i

(five mark questions)

Q1. Explain the law of independent assortment.
Q2.Explain the law of dominance using monohybrid cross
Q3.Mention any two autosomal genetic disorders with their symptoms.
Q4.Explain the following terms with the example. Co- dominance, incomplete dominance.
Q5.Briefly mention the contribution of T.H. Morgan in genetics
Answer Key: 1. a 2.a 3.b 4.d 5. 9:3:3:1 6. sex 7. 1:2:1 8. Wilhelm johannsen 9. true 10. true 11.true 12. true

Chapter 5- Molecular Basis of Inheritance

1.The basic unit of heredity is:
a) Chromosome b) Gene c) DNA d) Allele
2.The structure of DNA was first described by:
a) Mendel b) Watson and Crick c) Darwin d) Lamarck
3.The enzyme responsible for unwinding the DNA double helix is:
a) DNA polymerase b) Helicase c) Ligase d) Primase
4.Which of the following is a nitrogenous base found in RNA but not in DNA?
a) Thymine b) Adenine c) Uracil d) Cytosine
5. In a DNA stand the nucleotide are linked together by:
a) glycosidic bond b) phosphodisaster bond c) peptide bond d) hydrogen bond
6. Control of gene expression takes place at the level of:
a) DNA replication b) transcription c) translation d) one of the above

Fill in the blanks

7.DNA is composed of repeating units called _____.
8. The sugar found in RNA is _____.
9. The process of synthesis of RNA from DNA is called _____.
10. _____ is the enzyme responsible for joining Okazaki fragments.
11. The structure of the DNA double helix was proposed by _____.

True/ false

12. The genetic material in prokaryotes is found in the cytoplasm.

13.DNA replication occurs in the cytoplasm of eukaryotic cells.
14.A gene is a segment of DNA that codes for a protein.
15.RNA is synthesized during transcription using DNA as a template.
16.The process of translation occurs in the nucleus of the cell.

(five mark questions)
Q1.Explain replication with the help of a diagram.
Q2.What is transcription? Explain the process with the help of a diagram in prokaryotes.
Q3.Explain the process of translation in eukaryotes.
Q4. Explain the semiconservative mode of replication.
Q5.Explain the model of lac operon.
Q6.Explain Griffith experiment.

Answer Key: 1. b 2.b 3.b 4.c 5.b 6. B 7.genes 8.ribose 9. transcription 10.DNA ligase 11. Watson and crick 12. true 13. false 14. true 15. true 16.false

Chapter 6- (Evolution)

(one mark questions)
1.The concept of "survival of the fittest" was introduced by:
a) Darwin b) Lamarck c) Mendel d) Huxley
2.The process by which new species are formed is called:
a) Speciation b) Hybridization c) Natural selection d) Genetic drift
3.Which of the following is an example of divergent evolution?
a) Evolution of wings in birds and bats b) Evolution of similar structures in different organisms
c) Evolution of similar organs in similar environments d) All of the above
4.Which of the following provides evidence for evolution?
a) Fossils b) Comparative anatomy c) Molecular biology d) All of the above
5.The first step in the process of speciation is:
a) Isolation b) Mutation c) Natural selection d) Gene flow
6. The bones of four limbs of whale, bat, cheetah and man are similar in structure because
a) one organism has given rise to another b) they share a common ancestor
c) they perform the same function d) they have biochemical similarities.
7. Which of the following is an example for link species?
a) lobe fish b) dodo bird c) sea weed d) Tyrannosaurs rex

Fill in the blanks
8.The concept of natural selection was proposed by _____.
9. The preserved remains of ancient organisms are called _____.
10. Industrial melanism is an example of _____.
11. The first form of life is believed to have originated in _____ conditions.
12. _____ are the homologous organs found in vertebrates.

(True/ false)
13. Evolution is the process by which organisms adapt to their environment through natural selection.
14. Darwin proposed the theory of punctuated equilibrium.
15.Mutations are the primary source of genetic variation.
16. Artificial selection refers to the natural process of survival of the fittest.

(Two mark questions)
1) What is the difference between a connective link and a missing link ?

2) List three main points of Darwin theory.
3) What are analogous and homologous organs?
4) What are vestigial organs and give examples
5). What is founder's effect?

(three mark questions)

1. Write differences between apes and man.
2. What is adaptive radiation? Give one example.
3. Birds have evolved from reptiles. Give a reason.
4. Write about the evolution of a man.

Answer Key: 1.a 2. a 3. b 4. d 5.a 6. b 7. a 8. darwin 9. fossils 10. Natural selection 11.aquatic 12.wings of birds and bats 13. T 14. F 15. T 16. F

Chapter 7- Human Health and Diseases

(One mark questions)

1. Which of the following is an example of passive immunity?
a) Vaccination b) Maternal antibodies passed to a baby
c) Recovery from an infection d) Immune response to a pathogen
2.Which of the following is a non-infectious disease?
a) Tuberculosis b) Cancer c) Malaria d) Influenza
3. Antibodies present in colostrum which protect the newborn from certain diseases is of

a) IgG Type b) I gA type c) Ig D type d) IgE type

4. Which of the following is not a lymphoid tissue tissue:

a) spleen b) tonsils c)appendix d) Thymus

(Fill in the blanks)

5. The pathogen responsible for malaria is _____forming tissues.
6. The immunity developed after vaccination is called _____ immunity.
7. HIV infects _____ cells in the human body.

(True/ false)

8..Malaria is caused by a bacterium transmitted by mosquito bites.
9.Diabetes is caused by an inability of the body to produce or respond to insulin.
10.Tuberculosis is caused by the bacterium Mycobacterium tuberculosis.

(Two mark questions)

1.Write differences between innate and Acquired immunity ?
2) Write differences between active and passive immunity ?
3) What is metastasis ?
4) Draw a labelled diagram of an antibody molecule ?
5) Name the pathogens that cause Amoebiasis , Typhoid in humans. Give symptoms and mode of transmission ?
6) Mention the effects of nicotine on the human body.

(Three mark questions)

Q1. Write name of the causative agent, symptoms and preventive measures of pneumonia.
Q2. Write name of the causative agent, symptoms and preventive measures of typhoid.
Q3. Write name of the causative agent, symptoms and preventive measures of malaria.
Q4. Write name of the causative agent, symptoms and preventive measures of ascariasis.
Q5. Write name of the causative agent, symptoms and preventive measures of Amoebic dysentery.
Q6. Write name of the causative agent, symptoms and mode of transmission of elephantiasis.
Q7. Draw structure of an antibody molecule.
Q8. What are stimulants? Give examples and their effects.
Q9. What are hallucinogens? Name two hallucinogens and their source.

Q10. What are narcotics? Give examples and their harmful effects.
Q11. Write a note on opioids.
Q12. Write a note on cannabinoids.
Q13. Write harmful effects of alcohol abuse.
Answer Key: 1. b 2.b 3. B 4.c 5.plasmodium 6. active 7. T 8. T 9. T 10.T

Chapter 8- Microbes in human welfare

(One mark questions)

1. Which organisms serve as a Bio fertilizer
a) Azolla b)E.coli c)Spirogyra d) Cassia
2. The vitamin whose content increases falling the conversion of milk into curd by lactic acid bacteria is
a) Vitamin c b) Vitamin d c) Vitamin b12 d) Vitamin E
3. Methanogenic bacteria are not found in
a) Rumen of cattle b) Gobar gas plant
c) Bottom of water log paddy field d) Activated sludge
4. Which one of the following is not a nitrogen fixing organism
a) Anabaena b) Nostoc c) Azotobacter d) Pseudomonas
5. Big holes in Swiss cheese are made by a
a) A machine b) A bacterium that produces methane Gas
c) Bacterium producing a large number of carbon dioxide
d) A fungus that release a lot of gases during the metabolic activities
6. What would happen if oxygen availability to activated sludge flocs is reduced
a) it will slow down the rate of degradation of organic matter
b) the centre of flocs will become anoxic which would cause the death of bacteria and eventually brakeage of the flocs
c) flocs would increasing in size as anaerobic bacteria would grow around flocs
d) protozoa would grow in large number.
7. Which one of the following alcoholic drinks is produced without distillation
a) wine b) whisky c) rum d) brandy
8. Rising of dough is due to
a) multiplication of yeast b) production of carbon dioxide
c) emulsification d) hydrolysis of wheat flour starch into sugar

(Fill in the blanks)

9.Cuddling of milk is done by_____
10. Symbiotic association of fungal hyphae and roots of higher plants are called_____
11. _____ is commonly called bakers yeast.
12. Biogas is produced during an aerobic fermentation of _____material.
13. Presence of more organic waste in waste water increases_____,but decreases_____

(True/false)

14. Beer, wine and whisky are known alcoholic beverages.
15. Organic farming involvest the replacement of chemical fertilizers and pesticide by biofertilizer and the biopesticides.
16.. Biogas plant provides energy source as well as manure.
17.. Methanogens do not produce oxygen.
18.. Bioactive molecule cyclosporin A is a waste product and it is produced by monascus purpureus

(two mark questions)

1.What are methanogens? Give one example ?
2.Explain term LAB ?
3.Explain the role of 1) Cyclosporin A. 2) Statin
4.Write differences between Primary Treatment and Secondary Treatment of sewage ?
5.Give an example to prove that microbes produce gasses during fermentation ?
6.How do biofertilizers enrich soil ?

7.Name any two species of fungus which are used in the production of antibiotics
Answer Key: 1. A 2.c 3. D 4. C 5.b 6. a 7. b 8.b 9. Lactic acid bacteria 10. mycorrhiza 11. Saccharomyces cervisiae 12. organic 13. BOD, DO 14. T 15. T 16. T 17.T 18.F

Chapter 9- Biotechnology: Principles and Processes

(One mark questions)

1.An enzyme catalyzing the removal of nucleotide from the end of DNA is
a) Endonuclease b) Exonuclease c) DNA ligase d)Hind-II
2. The role of DNA ligase in the construction of a recombinant DNA molecule is
a) Formation of phosphor diaster bond between two DNA fragments
b) Formation of hydrogen bond between sticky ends of DNA fragments
c) Ligation of all purine and pyrimidine bases
d)None of the above
3. Genetic material of virus is
a) RNA only b) DNA only
c) Both RNA and DNA d) Either DNA or RNA
4. Golden rice is a promising transgenic crop. when released for cultivation, it will help in
a) Allivation of vitamin A deficiency b) Pest resistance
c) Herbicidal tolerance d) Producing a petrol like fuel from rice
5. Polymerase chain reaction is most useful in
a) DNA synthesis b) DNA amplification c) Protein synthesis d) Amino acid synthesis
6.GEAC stands for
a) Genome engineering action committee b) Ground environment action committee
c) Genetic engineering approval committee d) Genetic and environment approval committee
7. Significance of heat shock method in bacteria transformation is to facilitate

a) binding of DNA to the cell wall b) optic of DNA through membrane transport protein

c) uptake of DNA through transient pores in the bacterial cell wall d) expression of antibiotic-resistant gene

(Fill in the blanks)

8_____are groups of letters that forms the same word when red from both forward and backward.
9. Recombinant DNA technology is also popularly called as genetic_____.
10. In method called_____recombinant DNA is directly injected into the nucleus of an animal cell.
11. Plasmids and phages are the_____which are used for cloning purpose in prokaryotes.

(True/false)

12.Exo nuclease remove nucleotide at specific position within DNA.
13. Plasmids are the most widely used cloning vector in the technique of gene manipulation in bacteria.
14. Bacteriophages are insects that infect animal cells by injecting their DNA into the cells.
15. E coli is a gram negative Bacterium is easy to handle and grow.
16. In bioreactor stirrer helps in mixing and optimum availability of nutrients to culture cells.

(Two mark questions)

1) What are molecular scissors? Give an example ?
2) What is the down -streaming process?
3) Give the Advantages of stirred tank Bioreactor ?
4) Name any 4 recombinant proteins. Write their therapeutic use ?
5) What is PCR ? What are its uses ?
6) Suggest a method to remove oil hydrocarbons from the seeds on the rDNAtechnology ?
7) Do Eukaryotic cells have restriction enzymes? explain.
8) Write a short note on the gene gun method ?

9) Draw a laballed diagram of pBR322 ?
10)) What is the origin of Replication?
11) How do restriction endonucleases function ?
Answer Key: 1. B 2. a 3. a 4. a 5. b 6.c 7.c 8. Palindromic sequences 9.engineering 10. microinjection 11.vectors 12. F 13. T 14. F 15. T 16.T

Chapter 10- Biotechnology and its Applications

(One mark questions)
1.GEAC stands for
a) Genome engineering action committee b) Ground environment action committee
c) Genetic engineering approval committee d) Genetic and environment approval committee
2. Silencing of mRNA has been used in producing transgenic plant resistant to
a) White rust b) Bacterial blight c) Boll worms d) Nematodes
3. The Bt gene is isolated from the organism called
a) Brassica naplu b) Rhizobium c) Azolla d) Bacillus thuringiensis
4. Which of the following is useful in solving cases of parental dispute
a) Hybridoma technology b) Western blotting c) ELISA d) DNA fingerprinting .
5. The trigger for activation of toxin of bacillus thuringiensis is
a) acidic ph of stomach b) high temperature c) alkaline pH of gut d) mechanical action in the insect gut.
6.C-peptide of human insulin is
a) a part of mature insulin molecule b) responsible of formation of disulphide bridge
c) removed during maturation of pro insulin to insulin d) responsible for its biological activity.

(True / False)
7. Cry proteins are a group of useful proteins.
8. In GMO a completely new trait is introduced.
9.Insulin consist of three short polypeptide chains chain A chain B and chain C
10. More than 95% of transgenic animals are mice.

(Fill in the blanks:)
11.In GM plants genetic modification enhance_____ value of food.
12. A nematode _____ can infect the root of a tobacco plant and cause a great reduction in yields.
13. In insulin chain A and chain B are linked together by _____ bridges.
14. Basmati rice is distinct for its unique aroma and _____

(Two mark questions)
1.What are cry proteins ? Name the organism that produces it ?
2.Write a note on biopiracy.
3.What are transgenic bacteria? Give one example ?
4.Write a note on golden rice ?
5.Why does the Bt toxin gene not kill the Bacillus bacteria In which it is found ?
6.Write the advantages of GMOs ?
7.Write a note on Bt cotton ?

(Three mark questions)
Q1. Give brief applications of biotechnology.
Q2.. Compare and contrast the advantages and disadvantages of production of genetically modified crops.
Q3. What are transgenic bacteria? Illustrate using any one example.

Q4. What are cry proteins? Name an organism that produces it. How has man exploited this protein to his benefit?
Q5. What is gene therapy? Illustrate using the example of adenosine deaminase (ADA) deficiency.
Q6. Write a note on golden rice.
Q7. Write a note on Bt Cotton.
Q8. What is RNA interference (RNAi)? Explain with examples.
Q9. How is transgenic tobacco plant protected against *Meloidogyne incognita*?
Q10. Give a brief account of genetically engineered insulin.
Q11. Give a schematic representation of the transformation of a proinsulin into insulin.
Q12. What are the advantages of transgenic animals?
Q13. What do you mean by GM organisms? Write three advantages of GMO.
Answer Key: 1. c 2.d 3.d 4. d. 5. c 6. C 7. T 8. T 9. F 10. T 11. nutritive 12. Meloidogyne incognita 13. disulphide 14. Flavour

Chapter 11- Organisms and Populations

(One mark questions)
1.Select the statement which best explain parasitism
a) One organism is benefited b) Both the organism are benefited
c) One organism is benefited other is not affected d) One organism is benefited other is affected
2.. Lichens are the association of
a) Bacteria and Fung b)Algae and Bacterium c) Fungus and Algae d) Fungus and Virus
3. World Population Day is on
a) 5thJune b) 11th July c) 4th October d) 21st March
4. Natality is balanced by Mortality there will be
a) Decrease in population growth b) Zero population growth
c) Increase in population growth d) Overpopulation
5.Cascuta is an example of
a) Mutualism b) Commensalism
c) Parasitism d) Competition
6. According to Allen's rule the mammals from colder climate have
a) shorter ear and longer limbs b) longer ear and shorter limbs
c) longer years and longer limbs d) shorter ear and shorter limbs

(Fill in the blanks)
7.The natural home of an organism is called_____
8.The protective similarity of one species of animal to another in appearance is known as_____
9.Rapid increase in human population is called_____
10.. Clown fish shows_____with sea anemones.
11..Brood parasitism occurs in_____
12.. Plants are called as_____ because the fixed carbon dioxide

(True / False)
13. The number of organisms in population are added by natality and emigration.
14. The best way to regulate population of a country is to decrease birth rate.
15. The basic unit of study in ecology is population.
16.Interspecific interaction in which smaller species is benefited and largest species is harm is called predation

(Two mark questions)
1) Difference between food chain and food web ?
2) Define decomposition and describe the process.

3) Define the ten percent law of energy ?

(Three mark questions)

1. describe the logistic population growth curve.
2. Define the following terms and give one example for each:- (a) Parasitism (b) Camouflage (c) Interspecific competition
3. Explain commensalism with one example.
Answer Key: 1. d 2. C 3. B 4. B 5. c 6. b 7. habitat 8. mimicry 9. Population explosion 10. symbiosis 11. birds 12. autotrophs 13. F 14. T 15. F 16. F

Chapter 12: Ecosystem

(One mark questions)

1.Which one of the following has a largest population in a food chain
a) Producers b) Primary consumers c) Secondary consumers d) Decomposers
2.Secondary most important trophic level in a lake is
a) Phytoplanktons b) Zooplanktons c) Benthos d) Fishes
3.Secondary producers are
a) Herbivores b) Producers c) Carnivores d) None of the above
4.What is percentage of Photosynthetic Active Radiation(PAR)in incident solar radiation
a) 100% b) 50% c)1-5% d) 2-10%
5.Pyramid of biomass in a pond ecosystem is
a) Inverted b) Always upright c) Sometimes upright d) Upright and sometimes inverted
6. Which of the following is not a producer?
a) spirogyra b) agaricus c) volvox d) nostoc
7. The process of mineralisation by microorganisms help in the release of
a) Inorganic nutrient from humus b) both organic and inorganic nutrient from detritus
c) organic nutrient from humus d) inorganic nutrient from detritus formation of humus

(Fill in the blanks)

8.In an ecosystem dominated by trees the pyramid of numbers is of _____type.
9.In aquatic ecosystems the limiting factor for productivity is _____.
10. Common detritivores in our ecosystem are_____

(Five mark questions)

COMPREHENSION

1.Read the passage and answer the following questions
A stable self sporting ecological unit, resulting from an interaction between biotic community, living organisms, and its biotic environment is called an ecosystem. An ecosystem comprises two main components, biotic, including plants, animals, microorganisms, abiotic, including substratum, water, minerals, pH, carbon dioxide, oxygen, and temperature. It must also receive a constant supply of light energy . It is convenient to divide it into two basic categories, namely the terrestrial and the aquatic. Forest, grassland, and desert are some examples of tal ecosystems and pond, lake, wetland, river and estuary are some examples of aquatic ecosystems. Crop fields and an aquarium may also be considered as man made ecosystems.

Questions

1. What is an ecosystem?
2. Name two major kinds of ecosystem
3. Name three abiotic components of an ecosystem
4. Give one example of a man-made ecosystem.

5. Give one example of a terrestrial ecosystem.
Answer Key: 1. d 2. B 3. A 4. b 5.a 6. B 7.d 8. upright 9. light 10. earthworms

Chapter 13- Biodiversity

(One mark questions)
1.Which of the following forest is known as the lungs of the planet Earth
a) Taiga forest b) Tundra forest
c) Amazon rainforest d) Rainforest of North East India
2.red data books are produced by
a) IUCN b) WWF c) IBWL d) None of these
3. Kaziranga National park is located in
a) Assam b) Bengal c) Kerala d) Himachal Pradesh
4.which of the following is not an ex-situ conservation
a) Cryopreservation b) Seed Bank c) Biosphere reserves d) Botanical gardens
5. Which of the following is not a cause of loss of biodiversity

a) destruction of habitat b) invasion of alien species

c) keeping animals in zoological parks d) over exploitation of natural resources.

(Fill in the blanks)
6.About _____percent of India's geographical land area is covered by forest.
7.First biosphere reserve in India was_____
8.Ranthambore National park is situated in _____

(True / False)
9. The Indian cheetah is an endangered species. (T/F)
10. National animal of India is the Lion. (T/F)
11. Project tiger was launched in 1989 in India. (T/F)

(Two mark questions)
1.What are sacred groves ?
2.Write differences in situ conservation and ex situ conservation .
3.What are hotspots? Name any two hotspots of India.

(Five mark questions)
1.Explain the importance of biodiversity.
2.Explain 3 main components of biodiversity.
3.How do we conserve biodiversity?
4.What are the 3 major threat categories of species?
5.Describe the main causes of loss of biodiversity

Answer Key: 1.c 2. A 3.a 4. C 5. c 6. 21% 7. nilgiri 8. Rajasthan 9. true 10. false 11.false

Class 10+2 Science
Subject-Biology
SAMPLE PAPER

NOTE:

1. Question paper has total four parts A,B,C and D with total of **19 questions**.
2. **Section A** has Ques No 1. having 20 questions of 1 mark each. 15 questions are **MCQ type** ,5 **fill in the blanks**
3. **Section B** has Ques no 2 to 11 -Total 10 Ques of 2 marks each Q.No 3,4,9 and11 have internal choice.
4. **Section C** has Ques No 12 to 16 -Total 5 Ques of 3 marks each Q.No 14 and 15 have internal choice.
5. **Section D** has Ques 17 to 19 -Total 3 ques of 5 marks with 100 % internal choice .

SECTION A

A) Multiple Choice Questions

i. The pollens can be store in liquid nitrogen at _____ temperature
   a) 96 degree Celsius. b) -196 degree Celsius. c) 196 degree Celsius. d) -96 degree Celsius
ii. Identify the disease which is not a sexually transmitted disease.
   a) Gonorrhoea b) Syphilis c) Amoebiasis d) Chlamydiasis
iii. Which part of sperm plays an important part in penetrating egg membrane ?
   a) Tail b) Acrosome c) Allosome d) Middle part
iv. Which of the following is an assisted reproductive technique ?
   a) IUD b) ZIFT c) GIFT d) Both b and c
v. ABO Blood groups are an example of
   a) Incomplete dominance b) Segregation c) Co-dominance d) Pleiotropy
vi. Widal test is used for the diagnosis of
   a) Malaria b) Pneumonia c) Tuberculosis d) Typhoid
vii Which part of poppy plant is used to obtain the drug smack?
   a) Flowers b) Roots c) Latex d) Leaves
viii The first genetic material discovered was
   a) DNA b) RNA c) Chromatin d) Proteins
ix Dinosaurs belongs to which geological period
   a) Permian b) Quaternary c)Cretaceous d) Carboniferous
x. Full form of GEAC
   a) General engineering approval council
   b) General engineering approval committee
   c) Genetic engineering approval council
   d) Genetic engineering approval committee

B) TRUE OR FALSE

xi. In parasitism one organism is benefited, other is harmed.
xii. Zoological Park is an example of in situ conservation
xiii Loss of biodiversity in a region may lead to extinction of species.
xiv The second Trophic level in a Lake is Zooplanktons
xv The infective stage of Plasmodium that enters the human body is trophozoite

C) FILL IN THE BLANKS

xvi Ovulation is induced by a hormone called _____

xvii _____which is obtained from Trichoderma polysporum is used as immunosuppressive agent.

xviii. _____ is used for commercial production of ethanol.

xix. The first restriction endonuclease is _____.

xx _____ is a high temperature tolerant enzyme used in PCR

SECTION B

Q 2. What is Parturition? Name the hormones involved in the induction of parturition.

Q 3. What is MTP? What is its use?

OR

Removal of gonads cannot be considered as contraceptive options.Why?

Q 4.What is the difference between codominance and incomplete dominance

OR

What is Point mutation ? Give an example.

Q 5. What is triple fusion? Where and how does it take place?

Q 6 . What are homologous organs ? Give an example .

Q 7. Write two differences between Active and Passive Immunity .

Q8. Name any two species of fungus which are used in production of antibiotics.

Q 9. Why is restriction endonuclease called a 'molecular scissors'?

OR

Why is Agrobacterium tumefaciens called natural genetic engineer?

Q 10. What are Cry proteins? Name an organism that produces it? How man has exploited this protein to his benefit.

Q 11. Differentiate between in situ and Ex- situ conservation of biodiversity.

OR

Differentiate between grazing food chain and detritus food chain.

SECTION C (3 marks each)

Q 12 Write down the name of causal agent , symptoms and mode of transmission of disease A.)Amoebiasis. B.) Pneumonia

. What is genetic code? Write its features?

Q 13.Explain the origin and evolution of man.

Q 14. What is genetic code? Write its features?

OR

Explain Meselson and Stahl experiment to prove semiconservative nature of DNA replication.

Q 15. What does PCR stand for? Give its principal. Briefly explain the steps involved in it.

OR

Explain the steps involved in the production of genetically engineered insulin?

Q 16. Explain mutualism with an example.

SECTION D (5 marks each)

Q 17. With a neat diagram, explain the 7 – celled,8-nucleate structure of female gametophyte.

OR

What is Spermatogenesis? Describe the process of spermatogenesis.

Q.18. State and explain Mendel's Law of Independent Assortment with the help of a dihybrid cross.

OR

What do you understand by Transcription. Explain the mechanism of transcription

Q19. A stable self-supporting ecological unit, resulting from an interaction between biotic community, living organisms, and its biotic environment is called an ecosystem. An ecosystem comprises two main components, biotic, including plants, animals, microorganisms, abiotic, including substratum, water, minerals, pH, carbon dioxide, oxygen, and temperature. It must also receive a constant supply of light energy . It is convenient to divide it into two basic categories, namely the terrestrial and the aquatic. Forest, grassland, and desert are some examples of terrestrial ecosystems and pond, lake, wetland, river and estuary are some examples of aquatic ecosystems. Crop fields and an aquarium may also be considered as man made ecosystems.

Questions

1. What is an ecosystem?
2. Name two major kinds of ecosystem
3. Name three abiotic components of an ecosystem
4. Give one example of a man-made ecosystem.
5. Give one example of a terrestrial ecosystem.

OR

Describe various causes of loss of biodiversity.

BIOLOGY SAMPLE PAPER (CLASS 10+2) -SESSION 2024 - 2025

Answer Key. (Section A)

i. B 2.c 3.b 4.d 5.b 6.d 7.c 8.b 9.c 10.d

11.True 12.False 13.True 14.True 15.False 16.Luteinizing hormone17.Cyclosporin A

18.Yeast 19.Hind II 20.Taq polymerase

CLASS 12TH SUBJECT-BIOLOGY. SAMPLE PAPER 2

SECTION -A

A) MULTIPLE CHOICE QUESTIONS

i) The phenomenon where the ovary develops into a fruit without fertilization is called.

a) Parthenocarpy b) apomixis c) asexual reproduction. d) sexual reproduction.

ii) Tubectomy a method of population control is performed on

a) both male and female b) male only. c) female only d) only pregnant women

iiii) z z/z w type of sex determination is seen in

a) platypus b) snails. c) snakes d) peacock

iv) Uracil is present in RNA at the place of

a) Adenine b) Guanine c) Cytosine d) Thymine

v). Analogous organ arise due to

a) divergent evolution b) artificial selection c) genetic drift d) convergent evolution

vi) the sporozoites that cause infection when a female Anopheles mosquito bite a human being are formed in:

a) liver of human b) RBCs of mosquito c) Salivary glands of mosquito. d) intestine of human

vii). The term molecular scissors generally refers to

a) DNA polymerase b) RNA polymerase c) restriction endonuclease d) DNA ligase
viii) Crystals of Bt toxin produced by some bacteria do not kill the bacteria themselves because:
a) bacteria are resistant to strain b) toxin is immature c) toxin is inactive d) bacteria are not resistant to strain
ix) Amensalism is an association between two species where:
a) one species is harmed and other is benefitted b) one species is harmed and other is unaffected
c) one species is benefitted and other unaffected d) both the species are harmed
X) which one of the following has a largest population in the food chain:
a) producers b) primary consumers c) secondary consumers d) Decomposers

WRITE TRUE OR FALSE :
xi). Oogenesis takes place in Corpus luteum.
xii) Cancer causing genes are called oncogenes.
xiii) 5th June is the world's environmental day.
xiv) Biogas plant provides energy source as well as manure.
xv) Exonuclease removes nucleotides at specific positions within DNA.

Fill in the blanks:
xvi) fertilization is _____ in humans.
xvii) _____ is the surgical method of contraception.
xviii) _____ causes amoebic dysentery.
xix) Cuddling of milk is done by _____.
xx) _____ was the first national park in India.
2. Why is Apple called a false fruit? Which part of the flower forms a fruit?
3. Write the functions of the ovary.
4. What is amniocentesis? Why is it banned in India?
OR
What are the measures that should be taken to prevent STDs?
5. What is chromosomal theory and who proposed it?
OR
Differentiate between monohybrid and dihybrid cross.
6.. What are analogous organs? Give an example.
7. What measures would you take to prevent waterborne diseases?
8. Do you think microbes can also be used as a source of energy. If yes, how?
9. Differentiate between plasmid DNA and chromosomal DNA.
OR
What is the down streaming process?
10. List any two recombinant proteins having therapeutic uses.
11. Distinguish between production and decomposition.
OR
Give the difference between in- situ and ex- situ conservation.
12. What is DNA fingerprinting? write its two applications.
OR
Why is the human genome project called a mega project?
13. What is adaptive radiation? Explain with an example.
14. List the harmful effects caused by alcohol and drug abuse
15. Draw a labelled diagram of pBR322.

OR

What is gene therapy?. illustrate using the example of adenosine deaminase deficiency

16. Write a short note on : a. Commensalism. b. Competition.

OR

What are sacred groves? Write an example.

17. Draw a labelled diagram of an anatropous ovule and explain its parts.

OR

What is the menstrual cycle.Which hormones regulate the menstrual cycle?

18 Explain replication of DNA with a diagram.

OR

Describe characteristics of chromosomal abnormalities :

1. Trisomy of 21st chromosome 2. XXO. 3. XO

19.. You may have heard of the earthworm being referred to as a farmer's friend.This is so because they help in the breakdown of complex organic matter as well as in loosening of the soil. Similarly decomposers break down complex organic matter into inorganic substances like carbon dioxide,water and nutrients and the process is called the decomposition. Dead plant remains such as leaves,bark,flowers and dead remains of animals,including the fecal matter, constitute detritus,.which is the raw material for decomposition. The important steps in the process of decomposition are fragmentation leaching, catabolism unification and mineralisation.

1.Why are earthworms called a farmer's friend?

2.What is decomposition?

3.Who does detritus form?

4.Write main steps of decomposition

Or

What is biodiversity? write the ways to conserve biodiversity.

ANSWER KEY OF one mark questions

i. a) Parthenocarpy ii. c) Only female. iii. d) Peacock iv. d) Thymine v. d) convergent evolution vi. c) Salivary gland of mosquito. vii. c) restriction endonuclease viii. c) toxin is inactive ix. b) one species is harmed, another is affected x). d) decomposers xi) false xii) true xiii) true xiv) true xv) false xvi) internal xvi) oral pills xvii) Entamoeba histolytica. xix) lactobacillus bacteria. xx) Corbett