

DEHRADUN PUBLIC SCHOOL
ASSIGNMENT (2023-24)
SUBJECT-BIOLOGY (044)
CLASS -XII

Chapter 2: Sexual Reproduction in Flowering Plants

Multiple choice Questions:

Q1. Cleistogamous flowers are self-pollinated because:

- a.They are bisexual flowers which do not open at all.
- b.They are bisexual and open flowers.
- c.They are unisexual.
- d.Their stigma matures before the anthers dehiscence.

Q2. The function of tapetum is:

- a. Dehiscence
- b. Mechanical
- c. Protection
- d. Nutrition

Q3. The phenomenon wherein, the ovary develops into a fruit without fertilization is called

- a. Parthenocarpy
- b. Apomixis
- c. Bagging
- d. Emasculation

Assertion-Reason Type Questions

Q4. Assertion: In angiosperms, the first fertilization is called syngamy and involves the fusion of egg nucleus with sperm nucleus.

Reason: Second fertilization is called vegetative fertilization.

- a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- c. If Assertion is true but Reason is false.
- d. If both Assertion and Reason are false.

Q5. Assertion: All angiosperms reproduce sexually.

Reason: All angiosperms produce seeds.

- a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- c. If Assertion is true but Reason is false.
- d. If both Assertion and Reason are false.

Subjective Type Questions:

Q6. Why do the integuments of an ovule harden and the water content gets highly reduced as the seed matures?

Q7. Differentiate between endosperm and perisperm, by giving one example of each.

Q8. List the different types of pollination depending upon the source of pollen grain.

Q9. Differentiate between microsporogenesis and megasporogenesis. Which type of cell division occurs during these events? Name the structures formed at the end of these two events.

Case Based Questions:

Q10. Read the paragraph given below and answer the questions that follow:

The pollen grains or microspores are the male reproductive bodies of a flower and are contained in a pollen sac or microsporangia. Each pollen grain consists of a single microscopic cell, possessing two coats: the exine and the intine. The exine of a pollen grain is made up of chemically stable material. Because of this, pollen grains are often very well preserved for thousands of years in soil and sediments.

i. One of the most resistant biological material present on the exine of pollen grain is _____.

- a. Pectocellulose
- b. Suberin
- c. Sporopollenin
- d. Cellulose

ii. The exine possesses one or more thin places known as _____.

- a. Placenta
- b. Germ pore
- c. Hilum
- d. Endothecium

iii. What is the function of germ pore?

- a. Emergence of plumule
- b. Absorption of water for seed
- c. Initiation of pollen tube
- d. microsporogenesis

- iv. The number of germ pore in dicots and monocots respectively are _____.
- a. One and three
b. Three and two
c. Two and three
d. Three and one

Chapter 3: Human Reproduction

Multiple choice Questions:

- Q1.** Which one of the following events is correctly matched with the time period in a normal menstrual cycle?
- a. Release of egg : 5 th day
b. Endometrium regenerates: 5 – 10 days
c. Endometrium secretes nutrients for implantation: 11 – 18 days
d. Rise in progesterone level: 1 – 15 days
- Q2.** The process of release of spermatozoa from Sertoli cells into cavity of the seminiferous tubules is called _____.
- a. spermiogenesis
b. spermatogenesis
c. spermiation
d. spermatocyte
- Q3.** After birth, colostrum is released from mammary glands which are rich in _____.
- a. at and low in proteins
b. proteins and low in fat
c. proteins, antibodies and low in fat
d. proteins, fat and low in antibodies
- Q4. Assertion:** In morula stage, the cell divides without increase in size.
Reason: Zona pellucida remains till cleavage.
- a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If both Assertion and Reason are false.
- Q5. Assertion:** Gametogenesis is the process by which gametes are formed in respective gonads.
Reason: Meiosis is important step towards formation of gametes in human beings.
- a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If both Assertion and Reason are false.

Subjective Type Questions:

- Q6.** Why are the human testes located outside the abdominal cavity? Name the pouch in which they are present.
- Q7.** List the different parts of human oviduct through which the ovum travels till it meets the sperm for fertilization.
- Q8.** List the names of the hormones, endocrine glands along with functions of the hormones that are crucial in causing spermatogenesis.
- Q9.** Explain in detail the various developmental stages of the zygote until implantation with suitable diagrams.

Case Based Questions:

- Q10. Read the paragraph given below and answer the questions that follow:**

Oogenesis is the process of formation of ovum in ovaries. The production of eggs in females begins before birth i.e. during the embryonic development stage but is completed only after fertilization. It consists of three phases- multiplication, growth and maturation. Oogenesis is controlled by hormones like GnRH, LH and FSH. GnRH secreted by the hypothalamus stimulates the anterior lobe of pituitary gland to secrete LH and FSH.

- i. What is the function of hormone FSH?
- a. It inhibits the formation of estrogen.
b. It induces the release of secondary oocyte.

- c. It stimulates the growth of graafian follicles.
- d. It causes ovulation.
- ii. The cell division involved in the formation of secondary oocyte _____.
 - a. Mitosis
 - b. Meiosis I
 - c. Amitosis
 - d. Meiosis II
- iii. Antrum is present in _____.
 - a. Primary oocyte
 - b. Tertiary follicle
 - c. Corpus luteum
 - d. Graafian follicle
- iv. Name the membranous cover of the ovum at ovulation.

Chapter 4: Reproductive Health

Multiple choice questions:

- Q1.** Increased IMR and decreased MMR in a population will:
- a. Cause rapid increase in growth rate.
 - b. Result in decline in growth rate.
 - c. Not cause significant change in growth rate.
 - d. Result in an explosive population growth.
- Q2.** The method of directly injecting a sperm into ovum in assisted reproductive technology is called _____.
- a. GIFT
 - b. ZIFT
 - c. ICSI
 - d. ET
- Q3.** Emergency contraceptives are effective if used within _____.
- a. 72 hrs of coitus
 - b. 72 hrs of ovulation
 - c. 72 hrs of menstruation
 - d. 72hrs of implantation
- Q4. Assertion:** Amniocentesis is often misused.
Reason: Amniocentesis is meant for determining the genetic disorders in the foetus, but it is being used to determine the sex of the foetus so that foetus may be aborted.
- a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 - c. If Assertion is true but Reason is false.
 - d. If both Assertion and Reason are false.
- Q5. Assertion:** Test tube baby has raised several legal problems.
Reason: It involves in vitro fertilization followed by embryo transfer.
- a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 - c. If Assertion is true but Reason is false.
 - d. If both Assertion and Reason are false.

Subjective Type Questions:

- Q6.** What do you think is the significance of reproductive health in a society?
- Q7.** Mention two advantages of lactational amenorrhea as a contraceptive method.
- Q8.** List any three characteristics of an ideal contraceptive.
- Q9.** Name any two copper releasing IUDs. Explain how do they act as effective contraceptive in human females.

Case Based Question

Q10. Read the paragraph given below and answer the questions that follow:

Reproductive and Child Health Care programme is a comprehensive sector wide flagship programme, under the umbrella of the Government of India's (GoI) National Health Mission (NHM), to deliver the RCH targets for reduction of maternal and infant mortality and total fertility rates. Components of RCH Programme: Women's health, safe motherhood (including safe management of unwanted pregnancy and abortion women's development. Child health (child survival and child development). Adolescent Health (sexuality development, adolescence education and vocational component).

- i. What is the full form of RCH?
 - a. Reproductive and Child Health Care
 - b. Reproductive and Child Health programme
 - c. Reproductive and Child Health Care programme

- d. Reproductive and Child Health
- ii. Mention which of the following is not a major task under RCH programmes?
- Creating awareness about family
 - Providing facilities and support for building reproductively healthy society.
 - Female foeticide
 - MTP
- iii. According to 2001 census report, the population growth was still around _____ percent at which our population could double in _____ years.
- 1.7, 33
 - 18, 33
 - 17, 35
 - 21, 23

Chapter 5: Principles of Inheritance and Variation

Multiple Choice Questions:

- Q1.** If there is a complete linkage in F₂ generation, the result will be:
- Parental and recombinant both types appear in equal ratio.
 - Parental types are more than recombinant types.
 - All will be parental types.
 - Parental types are less than recombinant types.
- Q2.** Incomplete dominance was discovered by _____.
- Bateson
 - Johannson
 - Corrans
 - Mendel
- Q3.** In which of the following genetic disorders, the man has an extra X chromosome?
- Klinefelter's Syndrome
 - Down's Syndrome
 - Turner's Syndrome
 - Colour blindness
- Q4. Assertion:** XX-XY type of sex determination mechanism is an example of female heterogamety and is found in *Drosophila*.
- Reason:** Male heterogamety is seen in moths where males produce two different types of gametes.
- If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 - If Assertion is true but Reason is false.
 - If both Assertion and Reason are false.
- Q5. Assertion:** A genetist crossed two plants. He got 50% tall and 50% dwarf plants in the progeny.
- Reason:** One parent was heterozygous tall white the other was dwarf.
- If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 - If Assertion is true but Reason is false.
 - If both Assertion and Reason are false.

Subjective Type Questions:

- Q6.** Give an example of polygenic trait in humans.
- Q7.** A cross was carried out between two pea plants showing contrasting traits of height of the plants. The result of the cross showed 50% parental characters.
- Work out the cross with the help of a Punnett square.
 - Name the type of the cross carried out.
- Q8.** Differentiate between the following:
- Homozygous and Heterozygous
 - Monohybrid and Dihybrid
- Q9.** In humans, males are heterogametic and females are homogametic, explain. Are there any examples where males are homogametic and females are heterogametic? Also describe as to, who determine the sex of an unborn child?

Case Based Questions:

Q10. Read the paragraph given below and answer the questions that follow:

ABO blood groups in human beings are controlled by the gene I. The gene I has three alleles- I^A, I^B and i. Since there are three different alleles six different genotypes are possible. If two persons with 'AB' blood group marry and have sufficient large number of children, their children could be classified as 'A' blood group: 'AB' blood group: 'B' blood group in 1: 2: 1 ratio. Modern technique of protein electrophoresis reveals presence of both 'A' and 'B' type of proteins in 'AB' blood group individuals.

- i. How many types of phenotypes can occur in ABO blood group?
 a. Six b. Two c. Three d. Four
- ii. ABO blood grouping in human beings cites the example of _____.
 a. Multiple allelism b. Co-dominance
 c. Incomplete dominance d. Both b and c.
- iii. If a man with A blood group marries a man with AB blood group. Which type of progeny indicates that man is heterozygous?
 a. O b. B c. A d. AB
- iv. The presence of both A and B type proteins in AB blood group individuals is an example of _____.
 a. Partial dominance b. Incomplete dominance
 c. Complete dominance d. Co-dominance

Chapter 6: Molecular Basis of Inheritance

Multiple Choice Questions:

- Q1.** Replication of DNA is _____.
 a. Conservative b. Semi-conservative c. Transcriptive d. Dispersive
- Q2.** The first gene – sequenced crop is
 a. Wheat b. Tobacco c. Rice d. Cotton
- Q3.** In the lac operon, the structural genes are switched off, when the repressor binds to
 a. Promoter b. Regulator c. Inducer d. Operator
- Q4. Assertion:** For transmission of genetic information RNA is better.
Reason: RNA is more stable than DNA.
 a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 c. If Assertion is true but Reason is false.
 d. If both Assertion and Reason are false.
- Q5. Assertion:** One codon may code one or more than one amino acid.
Reason: A codon is degenerate and ambiguous.
 a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 c. If Assertion is true but Reason is false.
 d. If both Assertion and Reason are false.

Subjective Type Questions:

- Q6.** If the base adenine constitutes 31 percent of an isolated DNA fragment, then what is the expected percentage of the base cytosine in it?
- Q7.** Draw a labelled diagram of a nucleosome. Where is it found in a cell?
- Q8.** Show DNA replication with the help of a diagram only.
- Q9.** The length of DNA in an eukaryotic cell is N 2.2 m How can such a huge DNA be packaged in a nucleus of micrometer in diameter?

Case Based Questions:

Q10. Read the paragraph given below and answer the questions that follow:

The genes in a cell are expressed to perform a particular function or a set of functions. For example, if an enzyme called beta-galactosidase is synthesized by *E.coli*, it is used to catalyse the hydrolysis of a disaccharide, lactose into galactose and glucose; the bacteria used them as a source of energy. Hence, if the bacteria do not have lactose around them to be utilized for energy source, they would no longer require the synthesis of the enzyme beta-galactosidase. The development and differentiation of embryo into adult organism are also a result of the coordinated regulation of expression of several sets of genes.

- i. Which one is not a part of transcription unit in DNA?
 a. The inducer b. Promoter
 c. Terminator d. Structural gene
- ii. The correct option regarding the lac operon in *E.coli* from the following is:
 a. lac operon is switched on in the absence of lactose

- b. lac repressor binds to the lac promoter
- c. beta- galactosidase is the only enzyme produced in large quantities when lac operon is turned on
- d. lac operon messenger RNA is a polycistronic mRNA
- iii. In a cell, as per the operon concept governs the, the regulator gene governs the chemical reactions by-
 - a. inhibiting the substrate in the reaction.
 - b. mRNA transcription inhibited
 - c. enzyme-reaction inactivation
 - d. none of the above
- iv. In *E.coli* when does the lac operon gets switched on?

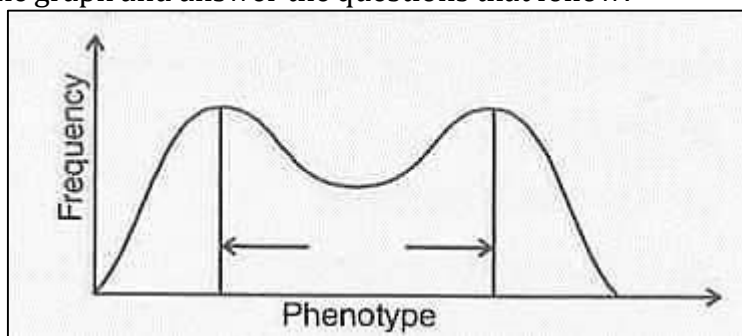
Chapter 7: Evolution

Multiple Choice questions:

- Q1.** Animal husbandry and plant breeding programmes are the examples of_____.
- a. Reserve evolution
 - b. Artificial selection
 - c. Mutation
 - d. Natural selection
- Q2.** Analogous organs arise due to_____.
- a. Divergent evolution
 - b. Random mechanism
 - c. Genetic drift
 - d. Convergent evolution
- Q3.** Viviparity is considered to be more evolved because:
- a. The young ones are left on their own.
 - b. The young ones are protected by a big shell.
 - c. The young ones are protected inside the mother`s body and are looked after when they are born leading to more chances of survival.
 - d. The embryo takes a long time to develop.
- Q4. Assertion:** There is an everlasting competition between individuals having similar requirements.
Reason: Populations tend to multiply arithmetically while food and space increase geometrically.
- a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 - c. If Assertion is true but Reason is false.
 - d. If both Assertion and Reason are false.
- Q5. Assertion:** The mechanism of origin and evolution can be suggested.
Reason: Evidences of origin and evolution of life are available.
- a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 - c. If Assertion is true but Reason is false.
 - d. If both Assertion and Reason are false.

Subjective Type Questions:

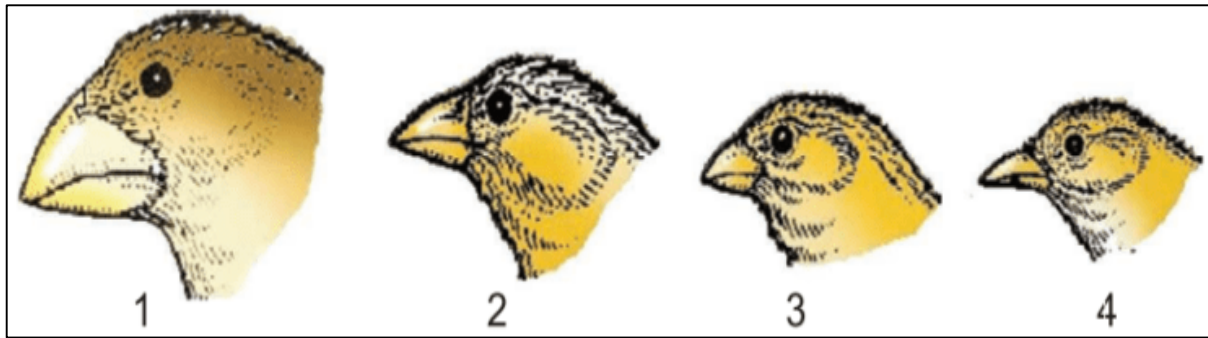
- Q6.** State the significance of study of fossils in evolution.
- Q7.** Differentiate between homology and analogy. Give one example of each.
- Q8.** Refer the graph and answer the questions that follow:



- i. The graph depicts which type of natural selection?
 - ii. Explain the other two effects/ types of natural selection
- Q9.** $p^2 + 2pq + q^2 = 1$. Explain this algebraic equation on the basis of Hardy-Weinberg`s principle.
- Q10. Case Based Question:**

Observe the figure answer the following questions:-

Darwin found the varieties of finches that in travelled to Galapagos Islands and observed variations in them.



- i. Adaptive Radiation in evolution can be best understood by studying the examples of
 - a. Dinosaurs
 - b. Australian Marsupials
 - c. Darwin's Finches
 - d. both b and c
- ii. The concept of inheritance of acquired characters is
 - a. Lamarckism
 - b. Neo-Lamarckism
 - c. Darwinism
 - d. Neo- Darwinism
- ii. What role does an individual organism play as per Darwin's theory of natural selection?
- iii. How did Darwin explain the existence of different varieties of finches on Galapagos Islands?

Chapter 8: Human Health and Diseases

Multiple Choice questions:

- Q1.** The substance produced by a cell in viral infection that can protect other cells from further infection is_____.
 - a. Serotonin
 - b. Colostrum
 - c. Interferon
 - d. Histamine
- Q2.** Which of the following is not a lymphoid tissue?
 - a. Spleen
 - b. Tonsils
 - c. Pancreas
 - d. Thymus
- Q3.** Humoral immunity is associated with_____.
 - a. T-cells
 - b. B-cells
 - c. macrophages
 - d. both a and b
- Q4. Assertion:** Some diseases that attack in childhood do not attack again.
Reason: Memory cells play an important role.
 - a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 - c. If Assertion is true but Reason is false.
 - d. If both Assertion and Reason are false.
- Q5. Assertion:** Skin forms the first line of defence.
Reason: It is a non-specific defence.
 - a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 - c. If Assertion is true but Reason is false.
 - d. If both Assertion and Reason are false.

Subjective Type Questions:

- Q6.** Explain what is meant by metastasis?
- Q7.** Retroviruses have no DNA. However, the DNA of the infected host cell does possess viral DNA. How is it possible?
- Q8.** Name the stage of the plasmodium that is transmitted to human body by the vector. Describe the life cycle of the parasite in humans.
- Q9.** What happens to an individual when a regular dose of drugs/ alcohol is abruptly discontinued? What characteristics manifest in the individual under such a condition?

Case Based Questions:

Q10. Read the paragraph given below and answer the questions that follow:

Everyday we are exposed to large number of infectious agents. However, only a few of these exposures result in diseases. Why? This is due to the fact that the body is able to defend itself from most of these foreign agents. This overall ability of body to fight against disease-causing microorganisms is termed as immunity. Immunity is of two types- Innate and acquired.

Innate Immunity is non-specific type of defence that is present since birth. This is accomplished by providing different types of barriers to the entry of the foreign agents into our body. Innate immunity consists of four types of barriers namely – physical, physiological, cellular, cytokine.

- i. A skin barrier that protects our body from entering microorganisms is _____.
 - a. Cellular
 - b. Physical
 - c. Physiological
 - d. both a and c
- ii. When the host is able to fight against disease-causing organisms, then the ability is known as
 - a. microbial growth
 - b. immunity
 - c. barriers
 - d. interferons
- iii. The two types of cells that acts as cellular barriers to provide innate immunity in humans.
 - a. Leucocytes and natural killer cells
 - b. B-lymphocytes and T- lymphocytes
 - c. B-lymphocytes and B-cells
 - d. Interferons
- iv. Write any one difference between innate and acquired immunity.

Chapter 9: Microbes in Human Welfare

Multiple Choice questions:

Q1. The primary treatment of waste water involves the removal of_____.

- a. dissolved impurities
- b. stable particles
- c. toxic substances
- d. harmful bacteria

Q2. Methanogens growing anaerobically on cellulosic material, produce_____.

- a. methane gas
- b. methane and carbon dioxide
- c. methane and hydrogen
- d. methane, carbon dioxide and oxygen

Q3. _____are organisms which enrich the nutrient quality of the soil.

- a. pesticides
- b. fungal hyphae
- c. biofertilizers
- d. both a and c

Q4. **Assertion:** Newer antibiotics are required to be produced regularly.

Reason: Pathogens often develop resistance to existing antibiotics.

- a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- c. If Assertion is true but Reason is false.
- d. If both Assertion and Reason are false.

Q5. **Assertion:** Cyclosporin A is an immunosuppressive medicine.

Reason: It stimulates the activation of T-cells and prevents rejections.

- a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- c. If Assertion is true but Reason is false.
- d. If both Assertion and Reason are false.

Short Answer Type Questions:

Q6. Explain the consequence if the oxygen availability to activated sludge flocs is reduced.

Q7. Name the microbes that help in the production of the following products commercially.

- i. Statin
- ii. Citric acid
- iii. Penicillin
- iv. Butyric acid

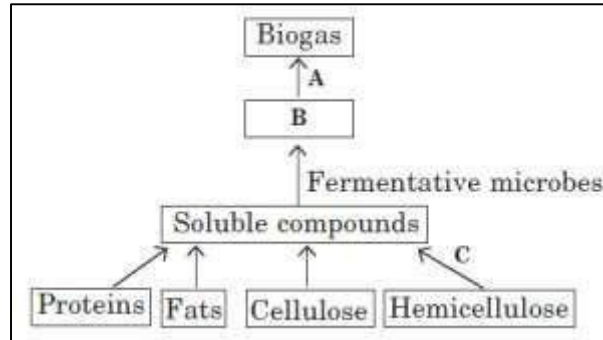
Q8. Draw a well labeled diagram of a biogas plant and explain its various components.

Q9. Write a note on fermentation of microbes and its applications.

Case Based Questions:

Q10. Read the paragraph given below and answer the questions that follow:

Villagers in a place near Chambur started planning to make power supply for agricultural purposes from cow dung. They have started a biogas plant for the purpose. Study the flow chart for biogas production given below.



- i. Biogas is composed of majorly
 - a. methane, CO₂ and O₂
 - b. CO₂, H₂S and H₂O
 - c. methane, CO₂ and H₂S
 - d. H₂S, H and O₂
- ii. In the given flow chart, 'A' denotes
 - a. aerobic bacteria
 - b. methanogenic bacteria
 - c. cellulose degrading bacteria
 - d. yeast and protozoa.
- iii. What is represented by 'B' in the flow chart?
 - a. carbohydrates
 - b. protein polymers
 - c. organic acids
 - d. fat globules
- iv. 'C' in the given flow chart causes
 - a. aerobic breakdown of complex organic compounds
 - b. anaerobic digestion of complex organic compounds
 - c. fermentation of organic compounds
 - d. fermentation of monomers.

Chapter 10: Biotechnology: Principles and Processes

Multiple Choice questions:

- Q1. The DNA polymerase enzyme used in PCR is obtained from_____.
 - a. *Thermus aquaticus*
 - b. *Escherichia coli*
 - c. *Agrobacterium tumefaciens*
 - d. *Salmonella typhimurium*.
- Q2. Which of the given statement is correct in the context of observing DNA separated by agarose gel electrophoresis?
 - a. DNA can be seen in visible light
 - b. DNA can be seen without staining in visible light
 - c. Ethidium bromide stained DNA can be seen in visible light
 - d. Ethidium bromide stained DNA can be seen under exposure to UV light
- Q3. The_____in a vector helps in identifying the transformants and eliminating the non transformants.
 - a. selectable marker
 - b. cloning vector
 - c. plasmids
 - d. Taq polymerase
- Q4. **Assertion:** Bacteriophage vectors are more advantageous than plasmid vectors.
Reason: Bacteriophage vectors can be easily detected at the time of cloning experiments.
 - a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 - c. If Assertion is true but Reason is false.

d. If both Assertion and Reason are false.

Q5. Assertion: DNA fingerprinting involves identifying differences in specific regions of DNA sequence.

Reason: DNA fingerprinting is the basis of paternity testing.

- If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- If Assertion is true but Reason is false.
- If both Assertion and Reason are false.

Subjective Type Questions:

Q6. Define vector in terms of biotechnology.

Q7. Why is plasmid an important tool in biotechnology experiments?

Q8. What is genetic engineering? List the steps involved in DNA technology.

Q9. Suggest and describe a technique to obtain multiple copies of a gene of interest in vitro.

Case Based Questions:

Q10. Read the paragraph given below and answer the questions that follow:

Restriction endonuclease was isolated for the first time by W. Arber in 1962 in bacteria. Restriction endonucleases cut the DNA duplex at specific points therefore they are also called as molecular scissors or biological scissors. Three types of restriction endonucleases are- Type I, Type II and Type III but only Type II restriction endonucleases are used in Recombinant DNA technology. Restriction endonuclease EcoR I recognizes the base sequence GAATTC in DNA duplex and cut strands between G and A.

- Only Type II restriction enzymes are used in gene manipulation because _____.
 - ATP is not required for cleaving
 - It consists of three different sub-units
 - It makes cleavage or cut in both strands of DNA molecule
 - Both a and c
- Which of the following ions are used by restriction endonucleases for restriction?
 - Mg²⁺ ions
 - Mn²⁺ ions
 - Na⁺ ions
 - K⁺ ions
- Restriction endonuclease was isolated for the first time in.
 - plant cell
 - animal cell
 - prokaryotic cell
 - germinal cell
- Restriction endonuclease are also called molecular or biological scissors due to which of the following reason:
 - they cleave base pairs of DNA only at their terminal ends
 - they cleave one or both the strands of DNA
 - they act only on single strand DNA
 - they act on double stranded DNA

Chapter 11: Biotechnology and Its Applications

Multiple Choice questions:

Q1. Bt cotton is not_____.

- A GM plant
- Insect resistant
- A bacterial gene expressing system
- Resistant to all pesticides

Q2. The enzymes used for the isolation of DNA from (i)bacterial cells and (ii)fungus cells, respectively are.

- (i)lysozyme, (ii)chitinase
- (i)cellulase, (ii)chitinase
- (i)lysozyme, (ii)cellulase
- (i)protease, (ii)cellulase

Q3. A probe which is a molecule used to locate specific sequences in a mixture of DNA and RNA molecules could be_____.

- A single stranded RNA
- A single stranded DNA
- Either RNA or DNA
- Can be ssDNA but not ssRNA

Q4. Assertion: ELISA is widely used for the detection of infectious diseases like AIDS.

Reason: ELISA is very sensitive and selective test and needs very small amount of reagents.

- If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

- b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- c. If Assertion is true but Reason is false.
- d. If both Assertion and Reason are false.

Q5. Assertion: Vaccination is also called preventive inoculation.

Reason: A vaccine prevents the formation of antibodies inside the body.

- a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- c. If Assertion is true but Reason is false.
- d. If both Assertion and Reason are false.

Subjective Type Questions:

Q6. Expand GMO. How is it different from a hybrid?

Q7. Name the first transgenic cow. Which gene was introduced in this cow?

Q8. Explain with the help of one example how genetically modified plants can:

- i. Reduce usage of chemical pesticides.
- ii. Enhance nutritional value of food crops

Q9. What is a transgenic crop? State the advantages of the technique involved in the production of transgenic crop over breeding activities.

Case Based Questions:

Q10. Read the paragraph given below and answer the questions that follow:

Plants having foreign genes in their genome through genetic engineering are called transgenic plants. Genes can be incorporated either through a vector or through direct introduction of DNA. Bt cotton is a genetically modified organism which is pest resistant. It contains genes cry I Ac and cry II Ab of *Bacillus thuringiensis*. Bt cotton can resist cotton bollworm and produce higher yields. Cry gene produces cry protein or Bt toxin. Alkaline pH of the insect gut solubilizes the protein crystal, the activated toxin creates pores to the mid guts wall of the insects which cause them to death.

i. Bt cotton crops are –

- a. Algal resistant
- b. Insect resistant
- c. Flood resistant
- d. Bacterial resistant

ii. Cotton bollworms are killed by the protein encoded by the gene_____.

- a. cry I Ac
- b. cry I Ab
- c. cry II Ab
- d. both a and c

iii. Which of the following is not an advantage of GM crop?

- a. GM plants enhance nutritional value of food.
- b. GM plants are more tolerant to abiotic stresses.
- c. GM plants have helped to reduce Post harvest losses.
- d. GM plants can cause gene transfer to non-target plant species.

iv. *Bacillus thuringiensis* is a_____.

- a. air borne bacteria
- b. soil borne bacteria
- c. soil borne fungus
- d. food borne bacteria

Chapter 12: Organisms and Populations

Multiple Choice questions:

Q1. Competition results in_____.

- a. Extinction
- b. mutation
- c. large number of niches
- d. symbiosis

Q2. Warm-blooded animals of cold climate have small extremities. This was stated by_____.

- a. Bergman
- b. Gloger
- c. Dollo
- d. Allen

Q3. In commensalism_____.

- a. both partners are harmed
- b. weaker partner is benefitted
- c. both partners are benefitted
- d. none of the partners is benefitted

Q4. Assertion: Census is held in India after every ten years.

Reason: Scientific study of population is called demography.

- a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

- b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- c. If Assertion is true but Reason is false.
- d. If both Assertion and Reason are false.

Q5. Assertion: Migration is an important factor which determines both population size and population density.

Reason: In migration, a major part of population goes from one area to another area.

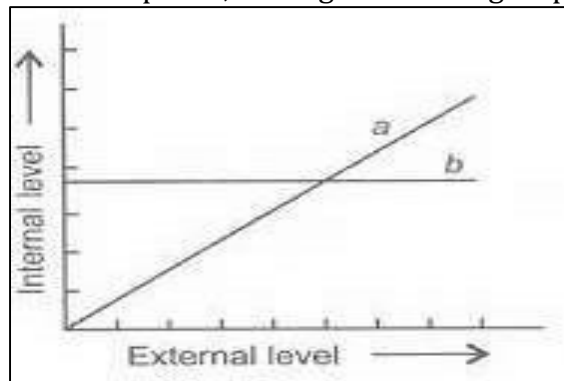
- a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- c. If Assertion is true but Reason is false.
- d. If both Assertion and Reason are false.

Subjective Type Questions:

Q6. What is an interaction between two species called?

Q7. What is high altitude sickness? Write its symptoms.

Q8. The graph given below depicts the organism response to changing external environmental conditions. According to their response, the organisms are grouped into two types.



- i. Name the group of organisms, which will show pattern A. Give an example.
- ii. Name the group of organisms, which will show pattern B. Give an example.
- iii. Define homeostasis.

Q9. Draw and explain logistic curve for a population of density (n) at time (t) whose intrinsic rate of natural increase is (r) and carrying capacity is (k).

Case Based Questions:

Q10. Read the paragraph given below and answer the questions that follow:

During teaching about various environmental factors, a teacher draw a figure that depicts like history strategies for three plant species (X,Y and Z) along three axes, strength of competition with other organisms, level of disturbance in the habitat and level of environmental stress in the habitat. Species X grows in habitat where competition among species is high but disturbance and stress are low. Species Y grows in habitat with high environmental stress but with low intraspecies competition. Species Z grows in highly disturbed habitats with low environmental stress.

- i. Which of the following is correct regarding plant type X ?
 - a. It has slow growth rate.
 - b. It lives in area with high probability of severe environmental changes.
 - c. It has good competitive ability at low population densities near the carrying capacity.
 - d. None of these.
- ii. Environmental stress occurs through_____.

a. very high temperature	b. Flood
c. nutrient efficiency	d. storm
- iii. Select the correct option regarding plant type X, Y and Z.
 - a. X type of plants is likely to be neem
 - b. Y type of plants could be desert plants
 - c. Z type of plants could be thorny plants
 - d. X type of plants could be shrub
- iv. Y type of plants grow under high stress and_____.
 - a. Produce large number of trees under short time after rains

- b. Have rapid growth
- c. Produce less number of seeds in a long time after rain
- d. Both a and b.

Chapter 13: Ecosystem

Multiple Choice questions:

- Q1.** Which one of the following has the largest population in a food chain?
- a. Producers
 - b. Primary consumers
 - c. Secondary consumers
 - d. Decomposers
- Q2.** Stability of ecosystem depends upon _____.
- a. Primary productivity
 - b. Interchange between producers and consumers
 - c. Number of producers
 - d. Number of consumers
- Q3.** Two species occupying same or overlapping area are called _____.
- a. Sympatric
 - b. Allopatric
 - c. Parapatric
 - d. Ring species
- Q4. Assertion:** The pyramid of energy is always upright.
Reason: Number of autotrophs in the pyramid of energy are maximum.
- a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 - c. If Assertion is true but Reason is false.
 - d. If both Assertion and Reason are false.
- Q5. Assertion:** Herbivores are also called as first order consumers.
Reason: These obtain their food directly from plants.
- a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 - b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 - c. If Assertion is true but Reason is false.
 - d. If both Assertion and Reason are false.

Subjective Type Questions:

- Q6.** Name any two organism which can occupy more than one trophic level in an ecosystem.
- Q7.** State difference between natural and artificial ecosystem.
- Q8.** Describe the different classes of consumers.
- Q9.** Describe a man-made ecosystem. Why are such ecosystems more efficient?

Case Based Questions:

Q10. Read the paragraph given below and answer the questions that follow:

Organism occupy a specific place in their natural surroundings or in a community according to their feeding relationship with other organisms. Based on the source of nutrition of food, organism occupy a particular place, called trophic level, in a food chain. Organisms may also occupy different trophic levels in different food chains in the same ecosystem at the same time.

- i. what technical term is given to organisms occupying the (i)second and (ii)third trophic level, respectively, in a food chain.
- ii. Choose an example each for the first and second trophic levels of a food chain, from the list of organisms given below:
 Rabbit, Wolf, Phytoplanktons, Snail, Frog, Hydrilla
- iii. Why is the number of trophic levels in a grazing food chain limited?
- iv. Why does the detritus food chain become connected to the grazing food chain at some levels?

Chapter 14: Biodiversity and Its Conservation

Objective type questions:

- Q1.** Which of the following is not done in a wildlife sanctuary?
- a. Fauna is conserved
 - b. Flora is conserved
 - c. both a and b
 - d. Insects are conserved
- Q2.** Which one of the following is not a major characteristic feature of biodiversity hotspots?
- a. Large number of species
 - b. Abundance of endemic species

- c. Large number of exotic species
 d. Destruction of habitat
- Q3.** Which of the following group of plants exhibit more species diversity?
 a. Angiosperms
 b. Algae
 c. Fungi
 d. Bryophytes

Q4. Assertion: Improvement cutting is an important practice in forest management.

Reason: It provides space for growing new healthy trees.

- a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 c. If Assertion is true but Reason is false.
 d. If both Assertion and Reason are false.

Q5. Assertion: Genetic diversity within species increases with the increase in habitat variations.

Reason: It is essential for adaptation to varied environments.

- a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
 b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
 c. If Assertion is true but Reason is false.
 d. If both Assertion and Reason are false.

Subjective Type Questions:

Q6. What accounts for greater ecological diversity of India?

Q7. What is Red Data Book?

Q8. How is species diversity differ from ecological diversity?

Q9. What is meant by alien species invasion? Name one plant and one animal alien species that area threat to our Indian native species.

Case Based Questions:

Q10. Read the paragraph given below and answer the questions that follow:

IUCN maintains a Red Data Book or Red List which is a catalogue of taxa facing risk of extinction. The IUCN Red List (2004) documents the extinction of 784 species in the last 500 years. Some examples of recent extinction include Dodo, Quagga, Thylacine and Steller's Sea cow. The last twenty years alone have witnessed the disappearance of 27 species. Red List haseight categories of species.

i. Dodo, an extinct taxon, belongs to which country?

- a. Mauritius
 b. Africa
 c. Australia
 d. Russia

ii. To which of the following categories of IUCN *Berberis nilghiriensis* belongs?

- a. Extinct
 b. extinct in wild
 c. Endangered
 d. Critically endangered

iii. Steller's Sea Cow and Passenger Pigeon became extinct due to.

- a. Alien species invasion
 b. over-exploitation
 c. Co-extinctions
 d. Intensive agriculture

iv. Bali, Javan and Caspian are_____.

- a. species of tiger
 b. species of cheetah
 c. subspecies of tiger
 d. subspecies of cheetah