

HOTS CLASS XII
HIGHER ORDER THINKING SKILLS QUESTIONS

CLASS 12

CHAPTER 1

REPRODUCTION IN ORGANISMS

1. Is marchantia monoecious or dioecious? what are the sex organs borne in this plant?
2. Amoeba is immortal. Explain
3. Which is the most critical event in sexual reproduction?
4. How does new organism develop in rotifers, turkey, honey bee and lizards?
5. What are meiosis? By which type of division the gametes are produced in diploid organisms?

CHAPTER 2

SEXUAL REPRODUCTION IN FLOWERING PLANTS

1. Name the type of pollination that ensures genetic variation?
2. The plant yucca and moth cannot complete their life cycle without each other. Why?
3. Cleistogamy can favour only autogamy. Justify
4. Can an unfertilized, apomictic embryo sac give rise to a diploid embryo? If yes how?
5. Name the plants in which chasmogamous and cleistogamous both types of flowers are formed?

CHAPTER 3

HUMAN REPRODUCTION

1. Placenta is called an endocrine gland. Why? Give reasons to support your answer?
2. Enlist the chromosome no. in ovum, first polar body and second polar body of human body.
3. Why does corpus luteum secrete large amount of progesterone during luteal /secretory phase of menstrual cycle?
4. Name two hormones that can only be found in the blood of pregnant women. Mention the source that secretes each of them.
5. What name is given to the cells of inner cell mass, that have the potential to give rise to all tissues and organs in a human being?

CHAPTER 4

REPRODUCTIVE HEALTH

1. How can pregnancy due to unprotected sex be prevented?
2. Why is the term test tube baby a misnomer?
3. Classify the following contraceptive measures into different methods of birth control {1} Saheli {2} Tubectomy {3} Vasectomy {4} Condoms {5} Diaphragms {6} Cervical caps
4. When and why is MTP necessary?
5. An ideal contraceptive must be user friendly and effective. Why? State two reasons?

CHAPTER 5

PRINCIPLES OF INHERITANCE AND VARIATION

1. Which cross is the example of deviation from first rule of inheritance proposed by Mendel? Explain with example.
2. Observation from which cross shows deviation from third law of inheritance proposed by Mendel? Explain with an example.

3. What can be possible blood groups in children of the couple who are heterozygous A and heterozygous B for blood group?
4. Why males in humans and females in fowl (hen) said to be heterogametic?
5. What can be the disorders caused by the following type of aneuploidy –
 - a. 47 chromosomes with an extra copy of 21st chromosome
 - b. 47 chromosomes with an extra copy of X chromosome
 - c. 45 chromosomes with only one X chromosome

CHAPTER 6

MOLECULAR BASIS OF INHERITANCE

1. Draw a polynucleotide chain of the genetic material presents in your body cells.
2. Name the bonds formed between N Base and Deoxy sugar, N base and N base , sugar and two adjacent phosphates.
3. Why is discontinuous strand of DNA, synthesized in this manner while replication?
4. Why t-RNA is called as an adapter molecule?
5. Explain inducible type of, transcriptional level, regulation of gene in brief with diagrams.
6. The sequence of Amino acids in protein can be predicted by finding the sequence of N bases in DNA in prokaryotes, but not in eukaryotes. Why?

CHAPTER 7

EVOLUTION

1. What is Speciation? How does Natural Selection contribute to Evolution?
2. If the frequency of alleles changes in a population, how this are interpreted? Answer in the light of Hardy Weinberg Principle.
3. What does different beak structure suggest in case of Darwin's Finches?
4. Observe the diagram given below (Figure No.7.6 Pg. 133 Class XII Biology Text Book)
 - a. What does the above diagram represent?
 - b. Name the geographical region where these organisms are found?
 - c. What are the phenomena of evolution of diverse species from one point of origin, in a region called?
5. It is said that birds have evolved from ancient extinct Reptiles. When did it live (Name the period of Geological Time Scale)?
6. From the studies of chemical evolution of life on earth, it can be said that 'animal cell' came first to the earth than 'plant cell'. How can you justify the statement?

CHAPTER 8

HUMAN HEALTH AND DISEASES

1. Drugs are "boon and curse" justify the statement. 3
2. There are some chemicals that cause cancer name the term use for them. Name three things which cause cancer. Name the technique used for treating cancer.

CHAPTER 9

STRATEGIES FOR ENHANCEMENT IN FOOD PRODUCTION

1. Latest Health research, has shown ill effects of mobile on insects. What are they? How it would affect the plant? 3
2. A farmer of Rajasthan consults you for buying a cow he should buy cow of which breed and why? 3

CHAPTER10

MICROBES IN HUMAN WELFARE

1. What is downstream process? Draw the labeled diagram of stir-tank bioreactor.
2. What is bio-fertilizer? Explain the role of bacteria and Blue green Algae in production of bio-fertilizer.
3. What are broad spectrum antibiotics? Name the bacteria which produce it.

CHAPTER 11

BIOTECHNOLOGY : PRINCIPLES AND PROCESSES

1. Expand pUC and where it is used?
2. What is the role of X-Gal in insertional inactivation?
3. Name the dye which is used for the detection of the fragments of DNA in gel-electrophoresis?
4. Why the restriction enzyme never cut its own DNA in *E. coli* but it cuts the DNA of alien when it is attack?
5. Why we use fragments with sticky end but not with blunt end in RDT?

CHAPTER12

BIOTECHNOLOGY AND ITS APPLICATION

1. For what purpose newly synthesized polypeptide A and polypeptide B are chemically treated?
2. Name the artificial insulin. Which company synthesized it?
3. Name the first transgenic cow.
4. How the early detection of infectious diseases possible by molecular diagnosis?
5. Give two reasons why Indian government has set up organization to monitor GM research and introduction of GMO for public services.

CHAPETR 13

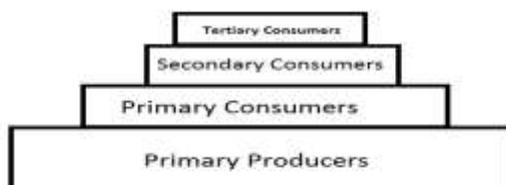
ORGANISMS AND POPULATIONS

1. Give an example of physiological adaptation in plants. 1
2. Why very small animals are rarely found in polar regions? 1
3. If a population growing exponentially doubles in size in three years. What is the intrinsic rate of increase (r) of the population ? 2

CHAPTER 14

ECOSYSTEM

1. Why are earthworms called the friends of farmers? Enlist the main steps of decomposition and the role of earth worms in it.
2. The detritus food chain and grazing food chain are interlinked at some levels in the terrestrial ecosystem. How can you explain it.?
3. Study the following pyramids



- (a) What does it depict?
- (b) Give reason for the type you identified above.

CHAPTER 15

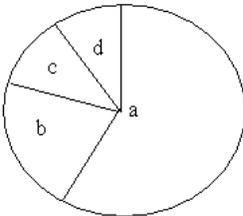
BIODIVERSITY AND CONSERVATION

1. How many species are there on the earth? Why do you say about global diversity? (2)
2. Where are the sacred grooves called last refuges for large number of rare as well as the threatened species? (2)
3. How does a national park differ from a zoological park in regard to conservation approach? (3)
4. How is on-site conservation different from off-site conservation. Support your answer by examples? (3)
5. According to Tilman, greater the diversity greater is the primary productivity. Can you think of a very low diversity man-made ecosystem that has high productivity? (2)
6. Is it true that there is more solar energy available in the tropics? Explain? (3)
7. Why is it said that ecosystems with diversity can withstand environmental changes better than others? (3)
8. The species diversity of plants(22%) is much less than that of animals(72%). What could be the possible reason for this? (3)

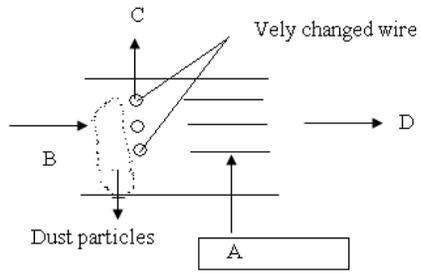
CHAPTER 16

ENVIRONMENTAL ISSUES

1. Motor vehicles with catalytic converter should use unleaded petrol. Why? (1)
2. Why should we be thankful to micro-organism present in domestic sewage? (1)
3. Mention the green house gases & their proportion in the pie diagram given below. (2)



4. A farmer saw water in a pond turned green & with dead fishes. (2)
 - a) What is the reason for the death of fishes?
 - b) Name the phenomenon that leads to the death of fishes.
5. Identify the wrong pair/s and correct it. (2)
 - a) Chernobyl incident-Radio active waste
 - b) Snow blindness cataract- High dose of CFC
 - c) Chipko movement- Save trees
 - d) Polyblend-Solves air pollution.
6. Many coastal areas may get submerged due to the environmental changes taking place at the present rate. Give the cause, and state two measures to check it. (3)
7. What measures would you take to reduce environmental pollution? (5)
8. Observe the following figure carefully and answer the questions that follow. (5)



- a) Label the parts A, B, C & D
- b) What are the steps involved in the removal of particulate matter?
- c) How is it different from scrubber?

ANSWERS

CHAPTER 1

REPRODUCTION IN ORGANISMS

1. Marchantia is dioecious. The male sex organs are borne on antheridiophores and female sexorgans areborne on archegoniophores.
2. Amoeba is considered immortal because it does not undergo natural death. As soon as it matures, it undergoes division and forms daughter cells and remains immortal
3. Fertilization of gametes is the critical event in sexual reproduction
4. The female gamete undergoes development without process of fertilization and form new organisms
5. Meiosites are diploid gamete mother cells. Gametes are formed by meiosis in diploid organisms.

CHAPTER 2

SEXUAL REPRODUCTION IN FLOWERING PLANTS

1. Xenogamy.
2. The moth deposits its eggs in the locule of ovary and flower, in turn gets pollinated by the moth. The larvae of the moth come out of eggs as the seeds start developing.
3. In cliesgamy, flowers never open at all. Hence foreign pollen will not land on stigma of such flowers. So cliestogamy will only favour self pollination or autogamy.
4. Yes if embryo develops from the cells of nucellus or integuments, it will be diploid.
5. Oxalis and commilina.

CHAPTER 3

HUMAN REPRODUCTION

1. Placenta produces various hormones. It is called an endocrine gland. As an endocrine gland placenta produces various hormones—estrogen, progesterone, hPL- human placental lactogen, HCGX—human chorionic gonadotropin.
2. sperm-----23
 - i. 1-polar body-----23
 - ii. 2-polar body-----23
3. Progesterone hormone is essential for maintenance of endometrium of uterus, so that foetus may get implanted here.
4. Human chorionic gonadotropin. Human placental lactogen. The source that secretes them is placenta
5. Stem cells.

CHAPTER 4

REPRODUCTIVE HEALTH

1. Progesteron-estrogen combination and IUD administered within 72 hrs of intercourse.
2. Because the test tube baby is not developed in the test tube completely, only the fertilization part is carried out in vitro and the zygote is then transferred in to uterus where further development takes place.
3. {1} Oral pills
{2} Surgical methods
{3} Surgical methods
{4} Barrier methods
{5} Barrier methods
{6} Barrier methods

- MTP is carried out to get rid of unwanted pregnancies. It is also essential when the foetus is suffering from an incurable disease or when continuation of pregnancy could be harmful or even fatal to the mother and or foetus.
- {1} It should not interfere with the sexual drive/desire or desire or sexual act of user
 - {2} It should have no side effects
 - {3} It should be easily available.

CHAPTER 5

PRINCIPLES OF INHERITANCE AND VARIATION

- Incomplete dominance, In Snapdragon plant, Punnett square showing cross, phenotype and genotype
- Linkage, cross between Drosophila, % of parental and recombination in F₂ generation.
- All possible Blood groups – A, B, AB, O
 Father A $I^A o$ x Mother $I^B o$
 Children- $I^A o$ (blood group A) , $I^B o$ (blood group B) , $I^A I^B$ (blood group AB) , oo (blood group O)
- Human Males produce two types of gametes 50 % sperms with X chromosomes, 50 % sperms with Y chromosomes
 Female fowl produces two types of eggs 50 % with Z and 50 % with W chromosomes
- a. Down's Syndrome b. Klinefelter's Syndrome c. Turner's syndrome

CHAPTER 6

MOLECULAR BASIS OF INHERITANCE

- Fig.6.1 Pg 96 NCERT
- N base and deoxy sugar – N- glycosidic bond
 N base and N base – Hydrogen bond
 Sugar and phosphates – Phospho di-ester bond
- As DNA Polymerase can synthesize / extend the primer only in one direction i.e. $5' \rightarrow 3'$. On $3' \rightarrow 5'$ strand it can move only when the parent template strand is opened up by helicase.
- On one end it can join with Amino Acid and on the other side it join with codon on m RNA with anticodon.
- Lac operon. Lactose is an inducer of *Lac* Operon , Switch on and Switch off conditions with diagrams with repressor and with inducer.
- Eukaryotic genes, when transcribed form heterogenous RNA. Contains both coding and non coding sequences Exons and introns , needs to be processed by splicing, where as prokaryotic genes do not have such arrangement.

CHAPTER 7

EVOLUTION

- Origin of new species. Genetically better suited / adapted organisms increase in number stabilizing the trait or if the other trait is favoured its number increases showing the directional shift or two different traits are favoured number of their organisms increase leaving more number of progeny. over a period of time accumulation of such traits lead to evolution.
- Evolution is taking place, if frequency allele (of A individuals) increases that is more individuals with mean character value, if the change is showing more individuals with value other than the

mean value directional change (Allele frequency AA), if the change is showing more individuals with value other than the mean value ie peripheral character value (Allele frequency AA and aa) .

3. Different varieties of Finches have evolved from the same original stock and adapted according to different food habits in the new habitat eg. Seed eating , fruit eating, insect eating etc. It shows Adaptive Radiation that is originating from the same stock and radiating to different geographical regions and adapting accordingly.
4. a Marsupial Radiation
 - b. Australia continent
 - c. Adaptive Radiation
5. Jurassic period of Mesozoic era Reptiles is when Dinosaurs evolved into birds.
6. Light harvesting pigment evolved later in early evolution during Abiogenesis. Thus organic molecules dissolved in the 'broth' in oceans was the 'food' for early 'cell like' structures that is heterotrophic mode thus 'animal cell' came first, later Light harvesting pigment / molecules evolved leading to 'photosynthesis /chemosynthesis thus autotrophism.

CHAPTER 8

HUMAN HEALTH AND DISEASES

1. Drugs are boon as they are used as anesthesia during operations .They are curse when they are misused and drug abuse is there .
2. Carcinogens. Nicotine, alcohol, pan masala. Chemotherapy,surgery.

CHAPTER 9

STRATEGIES FOR ENHANCEMENT IN FOOD PRODUCTION

1. Insects get confused due to mobile signals and are unable to reach up to plants for pollination it affects the flower production. Decreases the insect population
2. Malvi. Because it can tolerate high temperature and can survive even if gets less water

CHAPTER 10

MICROBES IN HUMAN WELFARE

1. Purification of desired product from the mixture of bacteria sludge and end product in bioreactor Refer pg. 203 NCERT XII BIOLOGY
2. Biologically derived fertilizer is known as biofertilizer. *Azobacter, Rizobium , Nostoc, anabina*
3. Broad spectrum antibiotics are applicable and effective on various bacterial or lonr range bacterial species. Streptomyces

CHAPTER 11

BIOTECHNOLOGY :PRINCIPLES AND PROCESSES

1. p- Plasmid, U- University of and C- California. Used as vector in RDT.
2. X-gal helps in the detection of recombinant from the non-recombinant without plating them out.
3. Ethidium bromide
4. Because restricted sites are methylated which block the restriction enzyme to bind the host DNA.
5. Because they bind easily to other segments with complimentary sequences but in case of blunt ends we can't bind them.

CHAPTER 12

BIOTECHNOLOGY AND ITS APPLICATION

1. To join them together by disulphide bond and make an activate insulin of human nature.
2. Humulin and synthesized by Eli Lilly company.
3. Rosie cow

4. By the use of techniques like PCR.
5. a. validity of GM research
 - b. safety of introducing GMO for public services

CHAPTER 13

ORGANISMS AND POPULATIONS

1. CAM, stomata remains close during day and open during night
2. They have smaller surface to volume ratio which helps them to minimize loss of heat keeping rate of metabolism high.
3. $N_t = N_0 e^{rt}$
 $\frac{N_t}{N_0} = 2$
 $t = 3$
 $e^{3r} = 2$
 $3r = \log 2$
 $r = \frac{\log 2}{3}$

CHAPTER 14

ECOSYSTEM

1. Earthworms are detritivores cause fragmentation, leaching, catabolism, humification, and mineralization.
2. DFC and GFC are interlinked as large part of energy flow occurs via DFC then the GFC. Some organisms of DFC are prey to GFC animals
3. (a) It depicts pyramid of number.
 (b) Base of pyramid is broad and narrows at the top. Food relationship at secondary and tertiary consumers is represented at various levels in term of numbers it is upright pyramid in number

CHAPTER 15

BIODIVERSITY AND CONSERVATION

1. 2 millions species, diversity at the species level that is found in the biosphere.
2. Khasi, Garo, Jaintia Hills of Nagaland and Meghalaya that harbor the sacred species of plants that are threatened to human beings.
3. In national park in-situ conservation programmes are carried out while in the zoological parks ex-situ conservation programmes are carried out.
4. In on-site conservation protection in their natural habitat while in off-site conservation species are shifted from their natural habitats to a protected environment.
5. Apple garden, only one species of plant but the primary productivity is very high.
6. Yes, it is true because it lies on tropic of cancer that receives direct heat of sun.
7. More the number of species greater the resilience and resistance of the food chain and food web. So it will be stable ecosystem.
8. Because of ubiquitous nature of insects, bacteria and other animals like mammals, birds, fishes that are adapted over a large area including land, water

CHAPTER 16

ENVIRONMENTAL ISSUES

1. Lead inactivates catalyst.
2. Microorganism present in domestic sewage breaks down organic substances present in the sewage.

3. a = CO₂ = 60%
b = methane = 20%
c = CFC'S = 14%
d-N₂O = 06%
4. a. Algal bloom resulting in depletion of oxygen
b. Eutrophication.
5. b-snow blindness cataract-High dose of UV-B
D-Polyblend-solve plastic pollution.
6. Global warming due to the increase in conc. of greenhouse gases
 - i. It can be checked by. (Any 2)
 - ii. Growing more trees (afforestation)
 - iii. Reduce the use of fossil Fuel
 - iv. Prevent deforestation
7. i. Use of catalytic convertor
ii. Afforestation
iii. Nonuse of plastic
8. a. collection plate; b- Dirty air; c-discharge corona; d-Clean air
 - i) The electrode wires are maintained in several thousand volts, which produces corona that releases electron.
 - ii) Those electrons attach a dust giving negative charge.
 - b. The collecting plates attract the charged dust particles
 - c. The electrostatic precipitator removes the particulate matter where as the scrubber removes the gases like SO₂.

VBQ CLASS XII

VALUE BASED QUESTION CLASS XII

CHAPTER 1 REPRODUCTION IN ORGANISMS

Q1 The most vital event in the sexual reproduction is fusion of gametes. Honey bees produce their young ones by sexual reproduction. In spite of it in the bee colony, we find both haploid and diploid individuals, considering the above views answer the following questions

A) Name the haploid and diploid organisms. (2)

B) Analyze the reasons behind their formations. (3)

Q2 Reproduction is a Biological process that evaluates the continuity of species generation after generation. Each species have evolved its own mode of producing organisms. The farmers cultivate plants to get different products for their use.

A) Name two types of reproductions found in organisms. (2)

B) Out of two which is better mode of reproduction, Why? (3)

Q3 some trees in your area flower during same month year after year, some other flower throughout the year, whereas some other plants show seasonal flowering. Plants are mostly of 3 types—annual, biennial, perennial type. Some plant show unusual flowering.

Answer the following with respect to the statement

(A) What are 3 clear cut phases in the life of annual and biennial type of plants? (1)

(B) Why is it difficult to define these phases in perennial species of plants? (2)

(C) Name one plant that flower only once in its life time. (2)

CHAPTER 2 SEXUAL REPRODUCTION IN FLOWERING PLANTS

Q1 Some exotic species in plants have invaded India as a contaminant with imported wheat. Some of them have become ubiquitous in occurrence. The pollen grains cause harm to us.

(A) Name the grains whose pollens grains cause allergy and bronchial disorder in some persons. (2)

(B) Can pollens be useful to us? How? (3)

Q2 Now a days the human population is rapidly increasing to meet the nutritional demand of people, farmers are cultivating hybrid variety of food and vegetable crops extensively. Explain

(A) One problem of hybrids. (2)

(B) What is importance of apomixes in seed industry? (3)

Q 3 Artificial hybridization is popular among plant breeders. They produce commercially better varieties of desirable traits. Referring to this programe explain.

(A) What is meant by artificial hybridization?

(2)

(B) How can it be achieved?

CHAPTER 3 HUMAN REPRODUCTION

Q1 There is fashion now a days in the world that nursing mothers do not breast feed their young ones to maintain the shape of their breasts. The breast feeding is recommended by doctors to bring up healthy babies

(A) In the above situation define colostrum. (2)

(B) Why is colostrum necessary to new born babies during initial months of growth? (3)

Q2 In our society women are often blamed for giving birth to daughter.

(A) This is correct or not correct

(B) Give reasons to prove your answer.

Q3 In some cases we find that testes do not descend in the scrotum. Is it a healthy sign? Answer the following

(A) Say 'yes' or 'no' (1)

(B) Prove your answer with correct reasons (2)

(C) What is the function of scrotums? (1)

CHAPTER 4 REPRODUCTIVE HEALTH

Q1 There are large number of couples in India that are unable to produce children. But we blame the female for it. This problem may be in males now a days such couple can be assisted to have children by some ARTs.

(A) In this situation suggests possible le measures to have children. (2)

(B) Explain any 3 of them in detail. (3)

Q2 The human population growth is increasing day by day at an alarming rate and it can lead to scarcity of food , shelter , clothing in future. The govt . has asked people to take measures to check the growth rate. The wide variety of contraceptive is used by the people.

(A) What are the various categories of contraceptives? Explain in brief. (2)

(B) Can there be terminal method to prevent more pregnancy? Discuss (3)

CHAPTER:5 PRINCIPLES OF INHERITANCE AND VARIATION

Q1. Ravi was rushed to a nearby hospital after an accident which caused a lot of blood loss. The hospital failed to supply O negative blood for transfusion. Rahman who was attending a patient learned about the situation and agreed to donate blood being of the same blood group. Ravi's mother initially refused but was later convinced by her daughter.

a) What values do you find in Ravi's sister and Rahman?

b) Why can't O positive blood be transfused into Ravi's body?

c) What is the genetic basis of blood group inheritance?

Q2. Sonam is a bright, fair girl. Her parents are dark complexioned. Her friends in college regularly passed remarks asking her how she was so fair or what treatment she had undergone to become fair. Sonam got irritated at their repeated embarrassing questions. Her friend Srijita came to her support and invited the friends to the Biology lab where she explained the inheritance of body colour. The friends realised their mistake and stopped teasing Sonam.

Q3. The Biology teacher asked the students to verify the experiment on Transformation principle in bacteria to establish DNA as genetic material. The class was divided into two groups. The teacher asked them to submit the reports. Group 2 did not use mouse and did not repeat Griffith's experiment. The teacher praised them.

a) What values did Group 2 exhibit? 1

b) Which experiment did they perform? Explain in brief. 2

CHAPTER 6 MOLECULAR BASIS OF INHERITANCE

Q.1. Ramesh , while coming back home, saw a person on motorbike who was using mobile phone while driving and he met with an accident. Motorcyclist was badly hurt and was profusely bleeding. As a good citizen ,Ramesh took him to the hospital immediately where doctors after examining advised immediate Blood transfusion to save his life. Ramesh offered doctors his bleed but they refused as his blood group was not compatible with that of the victim. Now gives answers of following questions.

- (i) What are blood groups?
- (ii) Why have different people different blood groups?
- (iii) what value is displayed by Ranjit?

Q.2. DNA fingerprinting is a technique to identify differences in certain particular regions in DNA sequence of Human. Two bleed sample that is A and B were picked up from the crime scene and then these were handed over fingerprinting. Now explain.

- (i) How the technique of genetic fingerprinting is carried out?
- (ii) How this will be confirmed whether these samples belonged to the same individual or two different individuals?
- (iii) Give another use of DNA fingerprinting.

CHAPTER 7 EVOLUTION

Q1. A 'human skull' was found during excavation in an area. In the same area the remaining skeleton was found by Ramesh (a higher secondary student studying biology as a subject). Ramesh aligned the fossil remains and found it somewhat unusual for a human skeleton. He noted down the data as follows –

Long narrow face, heavy canines, wisdom tooth, 5 - 6 ft. in length, fully erect posture, some artifacts buried along with.

He quickly recognized it as semi human skeleton and reported to the archeology department With reference to the above statement answer the following –

- a. What could possibly be the taxonomic / paleontological status of the fossil?
- b. What values are depicted by Ramesh?
- c. What could be the cranial capacity of the fossil?
- d. What approximately be the time span when they would have lived. How do archeologists find the age of this fossil?

Q2. One day Naresh went to 'chaupaal' with his father. He observed the proceedings there. He heard people saying that to control mosquitoes, they are going to spray DDT. Being a student of science of Higher secondary class he interrupted the proceedings with permission of elders and explained how the use of DDT can be harmful and ineffective in long run.

Answer the following according to the details given above –

- a. Why did he interrupted the proceeding of the 'chaupaal' ?
- b. What values are exhibited by Naresh in the above scenario?
- c. Why can the use of DDT be harmful and ineffective in long run?
- d. What alternative measures do you suggest to control mosquitoes?

Q3. According to the stories heard in childhood from her granny, Prince, now a student of class XII, had always believed that all life on earth is a 'Special Creation'. When he studied about the

chemical evolution of life his long held ideas got challenged and then he realized and his beliefs changed.

- a. What is meant by 'Special Creation' regarding life and its origin?
- b. What values are exhibited by Prince?(after knowing the theory of chemical evolution of life)
- c. Who proposed the theory of chemical evolution of life and who proved it experimentally?
- d. Name the mixture of gases used and the source of energy in the experiment conducted.

Chapter 8: HUMAN HEALTH AND DISEASES

Q1. Praveen is drug addict He wants to come out of this habit. How would you help him answer the following questions: -

1+1+1=3

Which helping body would you recommend?

How would you take care that he should not revert to old habit?

How can we use his experiences?

Q2. There are some diseases that are infectious which are transmitted by air. Several microorganisms enter in our system answer –

1+1+1=3

What suggestions would you give to the people so that they do not catch infection?

How can you control them?

Name the pathogen responsible for it.

Chapter9 :STRATEGIES FOR ENHANCEMENT IN FOOD PRODUCTION

Q1. A farmer is having a cow:-

Name a technique by which he can fertilize it.

What problem he would have faced if he had not opted for it

Name a cow produced by GM Technique.

1+1+1= 3

Q2. A farmer is having a diseased animal

a. how can he detect?

b. What should he do?

c. Name some common animal diseases.

d. What precautions you would take while preparing shelter. 1+1+1+2 =5

Q3. Latest research, health shown ill effects of mobile on insects. What are they? How it would affect the plant?

CHAPTER 10 :MICROBES IN HUMAN WELFARE

Q1. One day Ram visited nearby dairy industry where he observed that technician are preparing the paneer/ cheese by using a inoculums of certain bacteria. Next day he suggests his mother to prepare the paneer by using bacterial inoculums similar to dairy paneer.

I. Mention the name of bacteria used in dairy to prepare the paneer.

II. Explain the advantages of dairy paneer over domestically prepare paneer

Q2. One day at early morning Dinesh went at long walk on beach area of Mumbai where he observed that many aquatic animals have died on the bank and an oil loaded ship was in accidental situation at the mid of ocean. Microbiologists were at rescue operation. They were spraying the culture of some bacteria on water surface.

1. How did the aquatic animal die due to oil spill.
2. Name the bacteria which was used in spray.

CHAPTER 11 BIOTECHNOLOGY: PRINCIPLES AND PROCESS

1. Suresh was a vegetable grower. He used to grow tomatoes and got very good yields since the vegetable market was far from his village and he had no transport facility, most of his harvest was rotten due to delay. He consulted his friend in Agriculture University who suggested him to grow transgenic tomatoes with delayed ripening genes. Read above passage and answer the question that follows: -

- a) What are the transgenic organisms?
- b) How are the transgenic tomatoes produced?
- c) What value was displayed by Suresh's friend?

CHAPTER 12 BIOTECHNOLOGY AND ITS APPLICATIONS

2. Anil's grandfather read about golden rice in a newspaper. Being a farmer he asked Anil to get more information from his teacher about this rice. Read above passage and answer the question that follows: -

- a) What is golden rice?
- b) Why is it beneficial for rice-eating poor people?
- c) What value is displayed by Anil's grandfather?

CHAPTER 15 BIODIVERSITY AND CONSERVATION

1. When we pass by a small pond or lake or even a canal it is a site of beautiful mauve coloured flowers of water hyacinth, the plant which completely covers the water surface. It is for these beautiful flowers that this plant was introduced into India but now we talk about the harm it has caused to our ecosystem and waterways.

- a) Write the scientific name of this plant? (1)
- b) How has it become a menace to be denoted as "Terror of Bengal"? (2)

2. The resource consumption pattern of people in economically developed and the developing countries differ radically.

- a) Who, b/w the two people of developed countries or of developing countries use more resources. Justify your answer? (2)
- b) What are the consequences of consumption of more natural resources on the environment. Explain? (3)

3. Isha says "Let no species encroach over the rights and privileges of other species. One can enjoy nature by giving up greed. But human activities have accelerated the rate of extinction of species in recent times.

- a) Name any four such mass activities. (2)
- b) Describe how each of these activities leads to loss of biodiversity? (3)

4. Due to habitat loss, fragmentation, pollution, deforestation, the species are declining and some are on the road to extinction. A particular species of wild cat is endangered. It must be protected from extinction.

a) In the above mentioned view which one is a desirable approach "in-situ or ex-situ to save the species?(2)

b) Justify your and explain the differences b/w the two approaches?(3)

CHAPTER 16 ENVIRONMENTAL ISSUES

Q1. Sampat and Ganpat are farmers and established a factory >after a few months electrostatic precipitator became out of order. Ganpat wanted to replace it but Sampat expressed the view that they have no effect of it on the productivity as well as income:therefore they should not waste money to replace it.

Answer the following –

a. Out of these partners whom do you support and why?

b. Suggest any 2 ways to stop such negligence.

c. What values are exhibited by Sampat?

Q2. A team of research workers observed that the population of fish eating birds is declining every year after the establishment of a pesticide factory nearby five years ago.

Answer the following-

a. What may be the possible reason in your opinion? Explain?

b. Can you suggest alternative to pesticide so that factory may be stopped?

Q3. A few months ago the people of Pratapgarh started disposing their wastes in the pond of the village which was earlier a source of drinking water. This resulted in deterioration of quality of water and fish mortality.

Answer the following-

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

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

c. What values are exhibited by the people ?

Q4. In the remote village, the whole family comprising four members died while sleeping in the closed room in cold winter. A Pot containing burning coal was also found in the room. The police investigated the matter & came to the conclusion that death occurred due to suffocation?

a. How did suffocation result in the death of whole family?

b. Emission of which gas resulted suffocation?

c. What values did this incident show?

Q5. The Government of one of the reputed states was planning to construct National Highway to decongest the city. But one hurdle came in the planning was that large number of trees have to be cut to make the project successful. However environmentalist came forward and helped the Government.

. Should the Government abandon the idea of construction of National Highway?

a. If no, then what steps Government have to be taken care of ?

b. What values are associated with this project?

ANSWER TO VALUE BASED QUESTIONS

CHAPTER 1

Ans 1(A) Queen and workers are diploid but male(drones) are haploid.

ANS1(B) Drones develop parthenogenetically. Since female gametes form new individuals without fertilization in honey bees therefore they are haploid and grow into males.

Ans2(A) Asexual and sexual reproduction.

Ans2(B) sexual is better method of reproduction because it ensures recombination and variations among the progeny essential for survival.

Ans 3 (A)

(1) Juvenile phase/ vegetative phase

(2) Reproductive phase

(3) Senescent phase

Ans 3(B) Since the entire life cycle of perennial plants has to be completed in one growing season , their senescent phase is very short, it is directly related to their reproductive phase.

Ans 3 (C) bamboo species

CHAPTER 2

Ans 1 (A) Carrot grass—Parthenium

Ans 1(B) Pollen tablet and syrups are consumed by athletes and race horses.

Ans2(A) Hybrids change the basic nature of the organisms hence may cause gene pollution and affect biodiversity.

Ans2 (B) Formation of seed without fertilization is apomixes. It maintains the hybrid vigour in crop plants. Therefore they can be stored and preserved for longer time. Apomictic seeds are cheaper than hybrid seed.

Ans 3(A) The different species / genera are crossed artificially for combination of desired traits to get commercially superior varieties of organisms is called artificial hybridization.

Ans3 (B) Anthers are removed from the bisexual flower before dehiscence(emasculation) and bagging is done to prevent contamination from unwanted pollen. ON attaining maturity mature pollens from desirable plant are dusted on stigma of bagged flowers and rebagged for fruit development to have desired quality of fruits and seed.

CHAPTER: 5 PRINCIPLES OF INHERITANCE AND VARIATION

Ans. 1.a.Humanity is above all religion. Ravi's sister shows understanding of science. Rahman believes in helping a person in need without thinking about which religion or caste he belongs to.

b) O+ blood group contains antigen for Rh factor. Rh negative blood lacks the antigen. So if the two

bloods mix it shall cause clotting resulting in death of the patient.

c)Human blood groups are A, B, AB and O. The four phenotypes are expressed by paired combination of three alleles (IA, IB and i). IA and IB are dominant alleles for blood groups A and B respectively. O blood group is due to lack of any dominant gene. Its genotype is ii. Alleles IAIB expresses both dominant traits and the blood group is AB.

Ans2-a) Humanity and responsibility towards a friend. She also used her knowledge to educate her friends.

Ans-b) Polygenic inheritance or quantitative inheritance

Ans-c) Height, weight, skin colour, hair colour, size of some organs, face form, intelligence etc of human beings are examples of quantitative inheritance.

Ans-d) Since each dominant allele synthesises equivalent amount of melanin pigment (to give skin colour), the skin colour is directly proportionately to the number of dominant alleles inherited. If the sum of recessive alleles inherited by the offspring be more than or equal to that of the parents, the child is expected to be fairer than the parents. E.g. if the parents are heterozygous for all alleles (3 dominant and 3 recessive) then they are intermediate in colour. If the child inherits 4 recessive alleles from the parents, the expression shall be fairer than the parents.

Ans3-a) Scientific attitude, awareness and love for animals and respect towards government policies.

Ans-b) The students repeated the experiment performed by Oswald Avery, Colin MacLeod and Maclyn McCarty (1933-44), who worked to determine the biochemical nature of 'transforming principle' in Griffith's experiment. They purified biochemicals (proteins, DNA, RNA, etc.) from the heat-killed S cells to see which ones could transform live R cells into S cells. They discovered that DNA alone from S bacteria caused R bacteria to become transformed. They also discovered that protein-digesting enzymes (proteases) and RNA-digesting enzymes (RNases) did not affect transformation, so the transforming substance was not a protein or RNA. Digestion with DNase did inhibit transformation, suggesting that the DNA caused the transformation.

CHAPTER 6 MOLECULAR BASIS OF INHERITANCE

Ans.1. (i) In human beings, blood is classified into four groups A, B, AB and O on the basis of proteins present on the surface of RBCs.

Ans.(ii). Different people have different blood groups due to difference in genotypes of different people. Blood groups are controlled by two codominant alleles and one recessive allele in human being.

Ans.(iii). Ramesh wanted to help others, without delay, in case of emergency.

Ans.2. In DNA fingerprinting, DNA is separated from the given sample or the blood spot etc. it is cut into fragments by restriction endonucleases. Fragments are separated by electrophoresis. Through Southern blotting, DNA fragments are transferred to a nylon membrane.

Radioactive DNA probes are attached to the particular parts of DNA fragments.

They are exposed on the film which have light and dark bands.

Ans.ii. Different colour schemes have been used to trace the origin of each band in the gel. Two alleles of a chromosome also contain different copy numbers of VNTR. Banding pattern of DNA from A and B matches.

Ans.iii. to the study of evolution, disputes of paternity, to study of relationship between two closely related species.

CHAPTER 7 EVOLUTION

Ans.1. a. *H. neanderthalensis*

b. awareness , scientific attitude, analytical ability

c. 1400 cc

d. 100000 to 40000 years back in central asia, C¹⁴ Dating

Ans. 2a. He got worried to know that something harmful from environmental view point may happen.

b. Scientific attitude, awareness and care for the environment, alert ness, analytical ability, dedication, responsibility

c. biomagnification, genetic resistance in mosquitoes

d. gambusia fish in ponds, no stagnant water , neem leaves fuigation

Ans.3a. created by God

b. Scientific attitude, awareness and care for the environment, alert ness, analytical ability, dedication, responsibility

c. Operin and Haldane and Urey Miller

d. NH₃,CH₄, H₂, H₂O

Chapter 8: HUMAN HEALTH AND DISEASES

Answer:-1

a. We would recommend him to NGO RUN rehabilitation center/ counselor.

b. We should train him that if he meets his old friends and they force him to take drug. He should remember his firm determination he made not take drug and should remember the pain he had undergone while he was leaving it and the new respect he had gained.

c. We can use his experience in curing other drug patients.

Answer:-2

a. They should not use his personal belongings. They should avoid shake hand. Whenever he sneezes he should be asked to put handcar chief. One should avoid any contact with him.

b. We can control it by taking medicines, going to consulting doctor and taking rest.

c. *Rhino Virus* is responsible for it.

Chapter9 : STRATEGIES FOR ENHANCEMENT IN FOOD PRODUCTION

Answer:-1

a. Artificial fertilization.

b. He would have to transport the cow to distant area.

c. Rosie.

Answer:-2

a. Animal becomes lazy, stops eating food, watering from mouth takes place.

b. He should go to veterinary doctor.

c. Foot infection, mouth infection, fever and worms

d. Shelter should be airy, well drainage system should be there, it should be free from insects and pests.

Answer3 :- Insects get confused due to mobile signals and are unable to reach up to plants for pollination it affects the flower production. Decreases the insect population

Chapter 10 :MICROBES IN HUMAN WELFARE

Ans1. Lactobacillus lacticus/ thermo bacillus Dairy cheese having more protein contents and less water

Ans2. 1. Surface oil increase the BOD or decrease the DO *Pseudomonasputida*

CHAPTER 11

- a) Yellow colored rice containing B-carotene (precursor of Vitamin A)
- b) Helps in the reduction of cases of night blindness due to the deficiency of vit.A in poor people.
- c) Displayed the value of learning new techniques of agriculture.

CHAPTER 12

- a) Those organisms which contains functional foreign gene.
- b) Produce by the introduction of foreign gene in tomato plant which delay ripening by RDT.
- c) He is concerned about his friend benefits and making his friend aware of the new techniques for delaying the rotting of tomato.

CHAPTER 15

1. a) *Eichornia crassipes*.

b) Due to its high rate of vegetative propagation it spreads very fast and covers whole water body.

2.a) Develop countries consume more natural resources as well as biodiversity utilisation because they have the ability by the technology advancement and their knowledge to utilize the maximum resources and biodiversity for their own development and making the living standard high.e.g.coal ,fossil fuel and fauna and flora, minerals etc.

b) Problem of pollution ,it may be of several types-air,water,land,noise,nuclear,global warming,and problem of unemployment.

3a).Four activities are-habitat loss and fragmentation,over exploitation,co-extinction,alien species invasion.

b) Refer to the NCERT textbook.

4. a) In-situ conservation is the best approach.

b) In-situ is its own natural site conservation while ex-situ is out of its natural site.

CHAPTER16 ENVIRONMENTAL ISSUES

Ans1. -a)I will support Ganpat because his approach is ecofriendly.

b)By imposing fine and punishment.

c)Decision making & concern about environment.

Ans2 -a)Pesticide entering in the food chain and resulting in biomagnifications.

b. Bio controlling agent to remove pest.

Ans3-a)Eutrophication.

b)Any 2 means of spreading awareness of disposal of waste and keeping the pond clean.

c) Service to society and concern about environment.

Ans.4. a. Due to burning of coal in the closed room, a silent killer gas (odourless, tasteless & colourless) was produced. It combined with haemoglobin due to its strong affinity for the same and does not allow the oxygen to bond with haemoglobin, resulting death due to suffocation.

b. Carbon-monoxide

c. Unawareness

Ans.5.a.No.

b. Government has to proceed with this project subject to the condition that 10 times trees should be planted on the cost of cut trees.

c. Problem solving, concern about the environment and maintenance of biodiversity of nature.