

SAMPLE Question Paper 7

(Questions-Answers)*

BIOLOGY

*A Highly Simulated Practice Question Paper for
CBSE Class XII Examination*

Time : 3 hrs

Max. Marks : 70

General Instructions

1. All questions are compulsory.
2. The question paper has four sections: Section A, Section B, Section C and Section D. There are 33 questions in the question paper.
3. Section-A has 14 questions of 1 mark each and 2 case-based questions. Section-B has 9 questions of 2 marks each. Section-C has 5 questions of 3 marks each and Section-D has 3 questions of 5 marks each.
4. There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
5. Wherever necessary, neat and properly labelled diagrams should be drawn.

SECTION A

(7 Mark)

1. Name one endangered plant species of India?
2. What do you mean by palindromic sequence?
3. Mention the DNA sequence coding for serine and the anticodon of tRNA for the same amino acid.
4. Name any one symbiont, which serve as biofertiliser. Mention its specific role.
5. Mention the useful as well as the harmful drug obtained from the latex of poppy plant.
6. Define test cross.
7. Name the parts of the flower which the tassels of corn cob represent.
8. Write the name of two hallucinogenic drugs and also mention the source from which they are obtained.
9. Where is acrosome present in humans? Write its function.

* * You are advised to attempt this sample paper without referring the explanations given here. However, cross check your explanations with the explanations given at the end of paper after you complete the paper.

10. Mention any two events that are inhibited by the intake of oral contraceptives pills to prevent pregnancy in humans.

Direction (Q. Nos. 11-14)

In each of the following questions, a statement of Assertion (A) is given followed by corresponding statement of Reason (R). Of the statements, mark the correct answer as

- (a) If both A and R are true and R is the correct explanation of A
 (b) If both A and R are true, but R is not the correct explanation of A
 (c) If A is true, but R is false
 (d) If both A and R are false
11. **Assertion** (A) The predominant site for control of gene expression in prokaryotes is transcription initiation.
Reason (R) The activity of RNA polymerase is regulated by accessory proteins, which affect recognition of start sites.
12. **Assertion** (A) The female external genitalia include mons pubis, labia majora and labia minora.
Reason (R) The glandular tissue of each breast contains single mammary lobe.
13. **Assertion** (A) Phenylpyruvic acid is excreted through urine in case of phenylketonuria.
Reason (R) The affected individual lacks enzyme phenylalanine hydroxylase.
14. **Assertion** (A) Proto-oncogenes are cellular genes required for normal growth.
Reason (R) Overexpression of these genes destroy malignant cells.

Or

Assertion (A) USA patent of brazzein is an example of biopiracy.

Reason (R) Brazzein, a protein obtained from West African plant, *Pentadiplandra brazzeana* and the gene encoding it has been patented by USA.

15. **Direction** Read the following and answer any four questions from 15(i) to 15(v) given below
 Interferons (IFNs) are proteins produced by a variety of cells in the inflammatory response to infections. Their production is triggered by the immune system in response to pathogens or cytokines. Once triggered they induce numerous molecular changes that affect cellular responses including cell growth and inflammations. IFNs can play both pathological and beneficial roles in the nervous system. There are two major classes of IFNs, i.e. type I (IFN- α subtypes, IFN- β , etc) and type II (IFN- γ). Types I and II IFNs use distinct but similar receptor systems.

- (i) The interferons can be used as
 (a) antibacterial drugs
 (b) antiviral drugs
 (c) antibiotic drugs
 (d) immunosuppressive
- (ii) Interferon is a type of protein which can be used to counter
 (a) homeostatic disorder
 (b) hepatitis caused by virus
 (c) common cold caused by virus
 (d) Both (b) and (c)
- (iii) A person has developed interferons in his body. He seems to carry an infection of
 (a) typhoid (b) filariasis
 (c) malaria (d) measles
- (iv) Antibodies are
 (a) proteins produced in response to pathogens in our body
 (b) secreted by the action of both T-lymphocytes and B-lymphocytes
 (c) molecules that specifically interacts with an antigen
 (d) All of the above
- (v) **Assertion** (A) Interferons are a type of glycoproteins produced by body cells infected by virus.

Reason (R) Interferons interfere with viral replication at the site of injury.

- (a) If both A and R are true and R is the correct explanation of A
 (b) If both A and R are true, but R is not the correct explanation of A
 (c) If A is true, but R is false
 (d) If both A and R are false

16. **Direction** Read the following and answer any **four** questions from 16(i) to 16(v) given below

Growth of a population with time shows specific and predictable pattern. Today, ecologists are concerned about unbridled human population growth and problems created by it in our country. This therefore makes us to be curious if different animal populations in nature behave the same way or show some restraint on growth. This growth patterns can be illustrated by two types of growth models that is exponential growth model and logistic growth model.

(i) In the exponential growth equation, if $b-d$ is represented by ' r ' then ' r ' may be called as

- intrinsic rate of natural increase
- extrinsic rate of natural increase
- morphological rate of natural increase
- phenotypical rate of natural increase

(ii) Exponential growth occurs when

- there is only sexual reproduction
- there is only asexual reproduction
- there is a fixed carrying capacity
- no inhibition from crowding

(iii) Carrying capacity is the capacity of

- habitat that has resources to sustain certain number of individuals
- population to reproduce and competitiveness
- population to reproduce
- individuals to fit among the natural environment

17. 'The advent of birth control pills resulted in increased risks of sexually transmitted diseases'. Assess the fact given above and present your opinion on it.

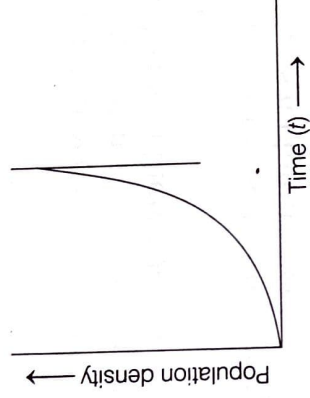
Or

In a flowering plant, a microspore, mother cell produces four male gametophytes, while a megaspore mother cell forms only one female gametophyte. Explain.

(iv) Logistic growth occurs when there is

- no resistance from increasing population
- unlimited food
- fixed carrying capacity
- All of the above

(v) Given population growth curve represents the growth curve.



Choose the correct conclusions drawn from the curve above.

- No population can grow exponentially for long.
- Exponential growth slows down as the population nears its log phase.
- Bacterial colonies have been observed to maintain exponential growth always.
- Exponential growth is a commonly observed in large slow-growing species such as humans and elephants.
 - I is true
 - I and II are true
 - II and III are true
 - IV is true

SECTION B

(2 Marks)

18. Differentiate between monohybrid cross and dihybrid cross.

Or

Differentiate between cistron and exon.

19. Highlight any two structural features which allow tRNA to adapt its role in translation.

20. Why are some untranslated sequence of bases seen in mRNA coding for a

- polypeptide? Where exactly are they present on mRNA?
21. How does a restriction enzyme function in RDT?
22. How recombinant DNA technology help in detecting the presence of mutant gene in cancer patients?
23. How does the application of cyanobacteria help to improve agricultural output?
24. Why are psychedelic drugs known as 'vision producing drugs'?
25. How do prickles help catcus to survive in desert? Give two methods.

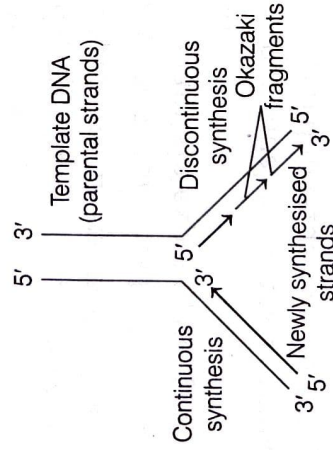
SECTION C

(3 Marks)

26. Mention the two different categories of microbes naturally occurring in sewage water. Explain their roles in cleaning sewage water.

27. How can *Agrobacterium tumefaciens* be used as a cloning vector? Explain.

28. DNA replication occurs in a small replication fork and not over its entire length as depicted in the figure given below.



- (i) Why is DNA replication continuous and discontinuous on the two strands of DNA?

(ii) Explain the importance of 'origin of replication' in a replication fork.

Or

Gregor Johann Mendel demonstrated the mechanism of transmission of characters from one generation to the other. He used pea plants for his experiments. What were the advantages of selecting pea plants for the same?

29. Insulin extracted from the pancreas of slaughtered pigs and cattle was helpful in treating diabetes, then why was there a need to develop genetically engineered insulin?

30. Give reasons for the following.

- (i) Integuments of an ovule harden and the water content is highly reduced as the seed matures.
- (ii) Apple and cashewnuts are called false fruits.
- (iii) Tubectomy is considered as a contraceptive measure.

SECTION D

(5 Marks)

31. The following is the illustration of the sequence of ovarian events (A-I) in a human female.

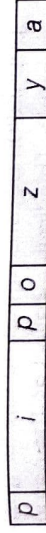


- (i) Identify the figure that illustrates ovulation and mention the stage of oogenesis it represents.
- (ii) Name the ovarian hormone and the pituitary hormone that have caused the above mentioned event.
- (iii) Explain the changes that occur in the uterus simultaneously in anticipation.
- (iv) Write the differences between C and H.
- (v) Draw a labelled sketch of the structure of a human ovum prior to fertilisation.

Or

Differentiate between microsporogenesis and megasporogenesis. Name the structures formed at the end of the two events.

32. Study the schematic representation of the genes involved in the *lac* operon given below and answer the questions that follows.



- (i) Identify and name the regulatory gene in this operon. Explain its role in switching off the operon.
- (ii) Why is *lac* operon's regulation referred to as negative regulation?
- (iii) Name the inducer molecule and the products of the genes 'z' and 'y' of the

operon. Write the function of these gene products.

Or

- (i) How is the amino acid sequence of a polypeptide chain related to the nucleotide sequence of mRNA?
- (ii) Write the characteristics of the genetic code.

33. List the different ways by which organisms cope or manage with abiotic stresses in nature. Explain any three ways.

Or

- (i) Taking an example of habitat loss and fragmentation, explain how are the two responsible for biodiversity loss.
- (ii) Explain two different ways of biodiversity conservation.

EXPLANATIONS

1. *Rauwolfia*, *Cycas* and *Santalum* are all endangered Indian plant species (Any one). (1)
2. A palindrome in DNA is a sequence of base pairs that reads the same on the two strands of DNA, when orientation of reading is kept the same. (1)
3. AGU, anticodon is UCA. (1)
4. *Rhizobium* is a symbiont bacteria that serve as biofertiliser. The bacteria fix the atmospheric nitrogen into organic form which is used by the plants as nutrients. (1)
5. Morphine is obtained from the latex of poppy plant. It is useful as a sedative and harmful when used as opioids. (1)
6. Test cross is a method devised by Mendel to determine the genotype of an organism. It is a cross conducted between unknown dominant genotype and the recessive parent. (1)
7. The parts of the flower that represent the tassels of corn cob are stamens or male reproductive parts. (1)
8. Two hallucinogenic drugs and their sources are as follows
 (a) **LSD** (Lysergic acid Diethylamide) It is obtained from *Claviceps purpurea* plant.
 (b) **Ganja** It is obtained from *Cannabis sativa* plant. ($\frac{1}{2} + \frac{1}{2}$)

9 In humans, the acrosome is present in the anterior portion of head of the human sperm. It contains enzymes which help in penetration of sperm into egg during fertilisation of the ovum. (1)

10 Oral contraceptives prevents pregnancy by inhibiting the secretion of FSH and LH from the anterior pituitary and also by inhibiting the entry of sperms in the uterus. (1)

11. (a) In prokaryotes, control of the rate of transcriptional initiation is the predominant site for control of gene expression. In a transcription unit, the activity of RNA polymerase at a given promoter is in turn regulated by interaction with accessory proteins, which affect its ability to recognise start sites. These regulatory proteins can act both positively (activators) and negatively (repressors). Thus, both A and R are correct and R is the correct explanation of A. (1)

12. (c) The female external genitalia include mons pubis, labia majora, labia minora, hymen and clitoris. The mammary glands are paired structures (breasts) that contain glandular tissue and variable amount of fat.

The glandular tissue of each breast is divided into 15-20 mammary lobes containing clusters of cells called alveoli.

Thus, A is true, but R is false. (1)

13. (a) Phenylketonuria is an inherited error of metabolism caused by the deficiency of enzyme phenylalanine hydroxylase. It is an autosomal recessive trait. Due to enzyme deficiency, it leads to inability to convert phenylalanine into tyrosine thus, resulting in overproduction of phenylalanine and its conversion to phenylpyruvic acid and other derivatives. These are then excreted in urine due to poor absorption by kidneys.
Thus, both A and R are correct and R is the correct explanation of A. (1)
14. (c) Proto-oncogenes are cellular genes required for normal growth. If they are muted or overexpressed, they may become oncogenes that contribute to the malignant transformation of the cell.
Thus, A is true, but R is false. (1)
Or
(a) Brazzein is produced by *Pentadiplandra brazzeana* and is approximately 2000 times as sweet as sugar. It is used as a low calorie sweetener. Local people have been using the super sweet berries from their plants for centuries but protein brazzein and the gene coding it is patented in USA.
It is proposed to transfer the brazzein gene into maize and express it in maize kernels from where it can be easily extracted. This is an example of biopiracy.
Thus, both A and R are correct and R is the correct explanation of A. (1)
15. (i) (b) Interferons can be used as antiviral drugs. (1)
(ii) (d) Interferon (a kind of protein) is a polypeptide produced by a T-cell infected with a virus that diffuses to surrounding cells and stimulates them to manufacture biochemicals that hinder viral replication. Thus, interferons can be used to encounter diseases caused by virus, i.e. hepatitis and common cold. (1)
(iii) (d) Interferons are produced by viral infected cells to act a defence in measles as measles is caused by virus. (1)
(iv) (d) Antibodies are proteins produced in our body in response to antigens (pathogens). Antibody molecule specifically interacts with an antigen to produce an immune response.
These are secreted by the action of both B and T-cells. (1)
- (v) (a) Interferon is a glycoprotein, production of which is induced within viral infected cells
Interferon in an antiviral state within adjacent cells by interfering with viral replication.
Thus, both A and R are true and R is the correct explanation of A. (1)
16. (i) (a) 'r' is the intrinsic rate of natural increase and is very important parameter chosen for assessing in parts of any biotic or abiotic factor on population growth. (1)
(d) Exponential growth model occurs when the resources available is unlimited in the habitat.
As resources are unlimited then there is no inhibition from crowding. (1)
(iii) (a) A given habitat has limited resources to support a certain number of individuals of a population beyond which no further growth is possible. This limit is called as the nature's carrying capacity (K) for that species. (1)
(c) Logistic growth models have fixed carrying capacity due to limited number of resources. (1)
(v) (a) Exponential growth curve predicts that no population can grow exponentially for long it decline rapidly after reaching the maximum carrying capacity. (1)
17. The advent of birth control pills encouraged people to have unprotected sexual intercourse and other means of contraception particularly condoms are not used. Thus, STDs are being more readily transmitted during sexual activities. (2)
Or
In flowering plants, microspore mother cells are found embedded in the sporophytic tissue of anther. These cells undergo meiosis and give rise to four microspores that remain together in a microspore tetrad. After attaining maturity, these microspores separate from each other and each microspore develops into a male gametophyte or pollen grain containing either two or three cells. On the other hand, megaspore mother cell develops in the ovary of a flower and divides by meiotic division to produce four megaspores. From these, three degenerate, while the one undergoes further development and mitotic divisions to produce female gametophyte.
Thus, in a flowering plant, a microspore mother cell produces four male gametophytes, while megaspore mother cell produces one female gametophyte. (2)
18. The differences between the monohybrid cross and the dihybrid cross are as follows
- | Monohybrid Cross | Dihybrid Cross |
|---|---|
| It is a cross between two individuals considering a single contrasting trait at a time. | It is a cross between two individuals considering two contrasting traits at a time. |

Monohybrid Cross	Dihybrid Cross
It helps to study the inheritance of a pair of allele.	It helps to study the inheritance of two pairs of alleles.
The phenotypic ratio in F_2 -generation is 3 : 1.	The phenotypic ratio in F_2 -generation is 9 : 3 : 3 : 1.
The genotypic ratio in F_2 -generation is 1 : 2 : 1.	The genotypic ratio in F_2 -generation is 1 : 2 : 1 : 2 : 4 : 2 : 1 : 2 : 1.

Or (2)

Differences between cistron and exon are as follows

Cistron	Exon
It is segments of DNA that codes for polypeptide chain, one tRNA, rRNA molecule.	It is regions of a gene that codes for different proteins.
It was discovered by Seymour Benzer.	It was discovered by Richard Robert.
It is an alternative term for gene and thus, appear on chromosomes.	It appears in mature or processed RNA.

(2)

19. The two structural features of tRNA which enable it to adapt to its role in translation are

- (i) It is a single-stranded polymer of nucleotides, with a triplet sequence called anticodon that determines the sequence of an amino acid to be formed during translation.
- (ii) It can form the shape of a clover where one end has an anticodon sequence and other end has a CCA point of attachment for an amino acid. (1+1)

20. The untranslated regions are required for efficient translation process. They are present before the initiation codon at the 5' end and after the stop/termination codon at the 3' end. (1+1)

21. A restriction endonuclease function by inspecting the sequence of DNA.

Each restriction endonuclease recognises a specific palindromic nucleotide sequence in the DNA. The enzyme binds to the DNA at its specific restriction site and cuts the DNA strands at the sugar-phosphate backbone. It cuts the strands of DNA a little away from the centre of the palindrome between the same two bases, in the two opposite strands. (2)

22. A single-stranded DNA or RNA tagged with a radioactive molecule (probe) is allowed to hybridise with its complementary DNA in a clone of cells followed by detection using autoradiography. The clone having mutated gene will not appear on the photographic film, because the probe will not have complementary base with the mutated gene, thus it is helpful in detecting the presence of mutated gene in cancer patients. (2)

23. Cyanobacteria are autotrophic microbes found in aquatic and terrestrial environments. Most of these fix atmospheric nitrogen, e.g. *Anabaena*, *Nostoc*, *Oscillatoria*, etc.

In paddy field, cyanobacteria serve as important biofertiliser. They also add organic matter to the soil, thus increasing the fertility. Hence, application of cyanobacteria helps in improving agricultural output. (2)

24. Psychedelic drugs or Hallucinogens can change one's behaviour, thoughts, feeling and perceptions without any actual sensory stimulus.

These usually produce a dream-like state with disorientation and loss of contact with reality without any true stimulus. These are also called 'vision producing drugs' as they produce false imaginations by affecting the cerebrum and sense organs. (2)

25. The two methods by which prickles help cactus to survive in desert are

- (i) By reducing and altering outer surface, they reduce evaporation and transpiration of water.
- (ii) By providing defence against grazing animals. (2)

26. Microbes like aerobic and anaerobic bacteria or fungi are found in sewage water.

After the primary treatment of water, aerobic bacteria are added in aeration tanks. Growth of these bacteria helps to reduce the BOD of water as they consume organic matter. Anaerobic bacteria are added in anaerobic sludge digesters, where they digest the sludge and form biogas. (3)

27. *A. tumefaciens* contains Ti-plasmid which induces tumour formation in infected plants and such tumours are called crown galls. The Ti-plasmid has been modified into cloning vectors and it helps in transferring desirable genes into various plants. *A. tumefaciens* is also called natural genetic engineer of plants, since these bacteria have natural ability to transfer T-DNA of their plasmid into the infected plant genome. (3)

T-DNA converts normal cells into tumour cells and directs them to produce the chemicals required by the pathogen.

If any desired gene is linked with Ti-plasmid, the desired chemical will be produced. (3)

- 28.** (i) Polymerisation by DNA dependent DNA polymerase occurs only in 5' → 3' direction on the 3' → 5' strand. This is because it adds bases at the 3'-end only.

Since, the two strands of DNA run in antiparallel directions, the two templates provide different ends for replication. Thus, replication on two templates proceeds in opposite directions.

One strand with 3' → 5' direction forms its complementary strand continuously because the 3'-end of the latter is always open for elongation. On the 3' → 5' template, the replication is discontinuous because only a short segment of DNA strand can be built in 5' → 3' direction due to exposure of a small stretch of template at one time.

- (ii) 'Origin of replication' is the sequence of DNA at which replication is initiated. Any piece of DNA when linked to this sequence can be made to replicate within the host cells. This sequence is responsible for controlling the copy number of the linked DNA. (2)

Or

The advantages of selecting pea plant by Mendel were as follows

- Pure varieties of pea plant were available.
- Pea plants showed a number of easily detectable contrasting characters.
- The flower structure of pea is such that it allows controlled breeding. Though, the plant shows self-pollination, it can also be cross breed manually.
- Pea flower normally remains closed and undergoes self-pollination.
- It is an annual plant with short lifespan and gives result within three months.
- A large number of seeds are produced per plant. (3)

- 29.** Genetically engineered insulin was mainly developed due to the following reasons

- Insulin being a hormone, is produced in a very little amount in the body. Hence, a large number of animals need to be sacrificed for obtaining small quantities of insulin for the management of diabetes. This makes the cost of insulin very high.

- Slaughtering of animals is not ethical.
- There is a chance of triggering of the immune response in humans against the administered insulin which is being derived from animals. (1)

- There is a possibility of slaughtered animals being infested with some infectious microorganisms which may contaminate the insulin.

- The insulin obtained from the slaughtered cattle and pigs was slightly different from human insulin.
- It may bring about some undesirable side effects such as allergy. (3)

- 30.** (i) During unfavourable conditions, seeds become dormant.

The loss of water reduces the metabolic activity of seeds and hardens the integuments. (1)

- The fruit which does not develop from ovary, but develops from any floral part is called false fruit. In apple and cashewnuts, thalamus contributes in the formation of fruit. So, they are called false fruits. (1)

- In tubectomy, a small part of Fallopian tube or oviduct is tied up to block the transport of sperm, so as to prevent fertilisation. So, it is considered as a contraceptive method. (1)

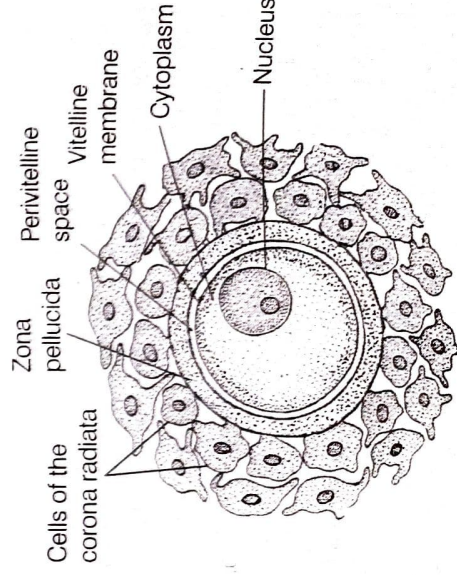
- 31.** (i) Figure F illustrates ovulation. It represents the ovulatory stage of oogenesis. (1)

- Progesterone is the ovarian hormone released during ovulation. Follicle Stimulating Hormone (FSH) and Luteinizing Hormone (LH) are the pituitary hormones released during ovulation. (1)
- In anticipation of receiving the fertilised egg, the endometrium of the uterus gets thickened and also the blood supply to the endometrium increases. (1)

- The figure C stage represents the secondary follicle and the H stage represents the degenerating corpus luteum.

Secondary follicle	Corpus luteum
It is surrounded by layers of granulosa cells.	Layers of granulosa cells absent.
Theca layer is present.	Theca layer is absent.

- Structure of a human ovum (1)



Or

Differences between microsporogenesis and megasporogenesis are as follows

Microsporogenesis	Megasporogenesis
It is the formation of microspores or pollen grains from diploid microspore mother cell.	It is the formation of haploid megaspores from diploid megaspore mother cell.
It occurs inside microsporangium or pollen sac of an anther.	It occurs inside the megasporangium or an ovule.
There are numerous functional microspore mother cells.	There is generally a single functional megaspore mother cell.
All the products of microsporogenesis are functional.	Only one megaspore is functional, while the others get degenerated.
The products of microsporogenesis give rise to the male gametophyte.	The functional product of megasporogenesis gives rise to the female gametophyte or the embryo sac.

(4)

The structures formed at the end of microsporogenesis and megasporogenesis are microspores (pollen grains) and megaspores (embryo sac), respectively.

($\frac{1}{2} + \frac{1}{2}$)

32. (i) **i gene** (regulatory gene) It codes for the repressor protein of the operon, which is synthesised constitutively.

The repressor has the affinity for the operator gene. It binds to the operator and prevents the RNA polymerase from transcribing the structural genes. (2)

(ii) When repressor binds to the operator the operon is switched off and transcription is stopped. So, its called negative regulation. (1)

(iii) Lactose is an inducer molecule. 'z' gene codes for β -galactosidase which is responsible for the hydrolysis of lactose into galactose and glucose. 'y' gene codes for permease. It increases the permeability of the cell to lactose. (2)

Or

(i) The relationship between the sequence of amino acids in a polypeptide and nucleotide sequence of DNA or mRNA is called genetic code. (1)

(ii) Characteristics of the genetic code are as follows

(a) **Triplet Code** Three adjacent nitrogen bases constitute a codon which specifies the placement of one amino acid in a polypeptide. (1)

- (b) **Start Signal** Polypeptide synthesis is signalled by two initiation codons, commonly by AUG or methionine codon and rarely by GCT or valine codon. They have dual functions.
- (c) **Stop Signal** Polypeptide chain termination is signalled by three termination codons, i.e. UAA, UAG and UGA. They do not code for any amino acid and are hence, called non-sense codons.
- (d) **Universal Code** The genetic code is applicable universally, i.e. a codon specifies the same amino acid from a virus to a tree or human being.
- (e) **Unambiguous Codons** One codon specifies only one amino acid and not any other.
- (f) **Commaless** The genetic code is continuous and does not possess any punctuation marks, like commas, after the triplets. If a nucleotide is deleted or added, the whole genetic code will be read differently.
- (g) **Non-Overlapping Code** A nitrogen base is specified by only one codon.

- (h) **Degeneracy of Code** Since, there are 64 triplet codons and only 20 amino acids, the incorporation of some amino acids must be influenced by more than one codon. Some amino acids are specified by two (e.g. phenylalanine, i.e. UUU, UUC) to six codons (e.g. arginine, i.e. CGU, CGC, CGA, CCG, AGA, AGG) and such codons are called degenerate or redundant codons. ($\frac{1}{2} \times 8$)

33. Organisms cope up with abiotic stress by following mechanisms

- (i) **Regulator Mechanism** Some organisms maintain homeostasis by physiological and behavioural means. They are called regulators. For example, (1)
 - (a) In summers, when outside temperature is more, we sweat profusely that results in evaporative cooling to bring down the body temperature. (1/2)
 - (b) In winters, when temperature is low, we shiver (a kind of exercise) that produces heat and raise the body temperature. (1/2)

(ii) **Conformer Mechanism** Organisms that cannot maintain a constant internal environment and their body temperature changes with the ambient temperature are called conformers.

For example, small animals have larger surface area relative to their volume. They lose body heat very fast in low temperature. So, they expend energy to generate body heat through metabolism for adjusting. (2)

(iii) **Migrating** The temporary movement of organisms from the stressful habitat to a more hospitable area and return when favourable conditions reappear is called migration. The long distance migration is very common in birds. (1)

Or

(i) When large-sized habitats are broken or fragmented due to human settlements, building of roads, digging of canals, etc., animals requiring large territories and some animals with migratory habitats are badly affected.

It also decreases the genetic exchange between populations leading to a declination of species. It can be seen in the Amazon rainforest (called the 'lungs of the planet') which is being cut and cleared for cultivation of soybean or for conversion into grasslands for raising beef cattle. (2½)

(ii) There are two basic approaches for conservation of biodiversity

- (a) *In situ* conservation (on-site conservation)
- (b) *Ex situ* conservation (off-site conservation)

- **In Situ Conservation** It is the conservation and protection of biodiversity in its natural habitat. It helps in recovering population in the surroundings where they have developed their distinctive features. e.g. National parks, biosphere reserves, wildlife sanctuaries.

- **Ex Situ Conservation** It is the conservation of selected rare plants and animals in places outside their natural habitat. It helps in recovering population or preventing their extinction under conditions that closely resemble their natural habitats.

e.g. Botanical gardens, zoological parks, wildlife safari parks, gene banks, etc. (2½)