

Sure Shot

CBSE Class 12th
Biology Solved
Guess Paper 2016
(Set – II)



Solved Guess Paper – 2016

Subject – Biology

Class – XII

Set – II

Time allowed: 3 hours

Maximum Marks: 70

General Instructions:

1. There are total 26 questions and five sections in the question paper. All questions are compulsory.
2. Section A contains questions number 1 to 5; very short answer type questions of 1 mark each.
3. Section B contains questions number 6 to 10, short-answer type I questions of 2 marks each.
4. Section C contains questions number 11 to 22, short answer type II questions of 3 marks each.
5. Section D contains question number 23, value based question of 4 marks.
6. Section E contains questions number 24 to 26, long-answer type questions of 5 marks each.
7. There is no overall choice in the question paper; however, an internal choice is provided in one question of 2 marks, one question of 3 marks and all the three questions of 5 marks. In these questions, an examinee is to attempt any of the two given alternatives.

SECTION-A

Question 1. How are flavr savr tomatoes different from normal tomatoes?

Answer.

Flavr Savr is a genetically modified tomato which was the first commercially grown genetically engineered food to be granted a license for human consumption.

Question 2. Name the type of chemical bond formed between two nucleotide units of a DNA molecule?

Answer.

Phosphodiester Bond

Question 3. Why do we call restriction enzymes as molecular scissors?

Answer.

A restriction enzyme is an enzyme that cleaves double stranded DNA, which is why it is called as the molecular scissors in genetic engineering.

Question 4. How a Water Hyacinth plant becomes so very harmful to the pond ecosystem?

Answer.

Water Hyacinths spread all over the pond and clog the entire pond. This decreases dissolved oxygen concentration in water and blocks photosynthetic activity of other water plants.

Question 5. Write the source of Taq polymerase enzyme.

Answer.

Taq DNA Polymerase was originally isolated from thermophilic hot spring bacterium called *Thermus aquaticus* (T. aquaticus).

SECTION-B

Question 6. Name the pioneer and climax communities of a Hydarch succession.

Answer.

The Phytoplankton stage constitutes the pioneer community and the Forest Stage is the climax community.

Question 7. Into which structure does the head of spermatozoa remain embedded after formation? Name the hormone secreted by this structure.

Answer.

Head of the spermatozoa remains embedded in Sertoli cells which releases Anti-Mullerian hormone (AMH).

Question 8. How Darwin's finches explain adaptive radiation?

Answer.

Darwin observed that 14 species of Galapagos finches evolved from a common ancestor. The different shapes of their bills, suited to different diets and habitats, showed the process of adaptive radiation.

Question 9. Why colostrum is so important to an infant?

Answer.

Colostrum is the first milk the mother's breasts produce after she has given birth. It contains proteins, carbohydrates, fats, vitamins, minerals, and proteins (antibodies) that fight disease-causing agents such as bacteria and viruses.

Question 10. What are RFLP and VNTRs? Which technique are they used into?

Answer.

RFLP is a technique used by molecular biologists to follow a particular sequence of DNA as it is passed on to other cells. It is the use of Restriction enzymes to cut the DNA strand into different lengths. VNTRs, Variable Number Tandem Repeats is an area in a genome where a short nucleotide sequence is organized in a repeated manner. They are used in DNA profiling or DNA fingerprinting.

OR

What is PCR method? Explain its significance.

Answer.

PCR or Polymerase Chain Reaction is a DNA amplification technique. To permit, such selective amplification, some prior DNA sequence information from the target DNA sequence is required. This information is used to design two oligonucleotide primers which are specific for the target sequence. After the primers are added to denatured template DNA, they bind specifically to complementary DNA sequences at the target site. In the presence of a heat stable DNA polymerase and DNA precursors, they initiate the synthesis of new DNA strands which are complementary to the individual DNA strands of the target DNA segment, and which will overlap each other.

SECTION-C

Question 11. Organisms are being used as bio fertilizers and bioweapons. Comment and give examples from each group.

Answer.

We live in an age where living organisms are being deployed for the welfare of mankind and simultaneously for the destruction of humans. Urbanization has brought along need for advancement but at the same time the wish for power, colonialism and imperialism. Bio-fertilizers are microbes which bring about nutrient enrichment in soil by enhancing the availability of minerals to crops. Cynaobacteria, Mycorrhiza, Azotobacter and Psuedomonas are some examples of biofertilizers. Microorganisms that are being used as a method to kill or incapacitate humans are called bioweapons. Bacillus anthracis, Brucella, Vibrio cholera are some microbes that are being used as weapons of mass destruction.

Question 12. (a) Which hormones are responsible for parturition?

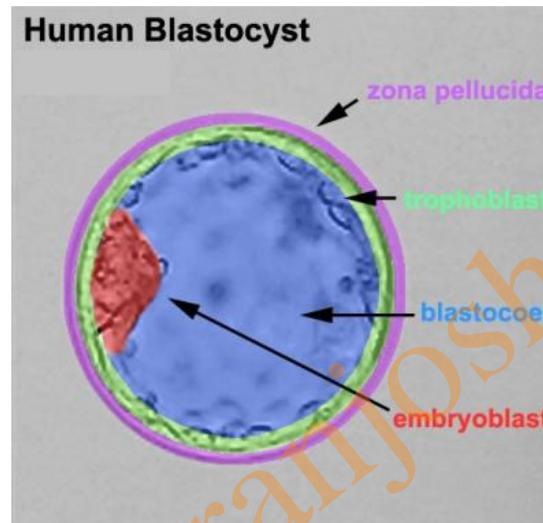
(b) Draw labelled diagram of a blastocyst.

(c) Mention the site of fertilization; describe how zygote develops and when it attaches to uterus?

Answer.

(a) Oxytocin, endorphins and adrenaline are the main types of hormones that play a key role in labor, birth and parturition.

(b) **Diagram of a blastocyst:**



(c) The site of fertilization is the fallopian tube of the female parent. A zygote develops when a male sperm enters the female egg and both the nuclei fuse together. The mitotic division starts as the zygote moves through the isthmus of the oviduct called cleavage towards the uterus and forms 2, 4, 8, 16 daughter cells called blastomeres. The embryo with 8 to 16 blastomeres is called a morula. The morula continues to divide and transforms into blastocyst as it moves further into the uterus and gets implanted.

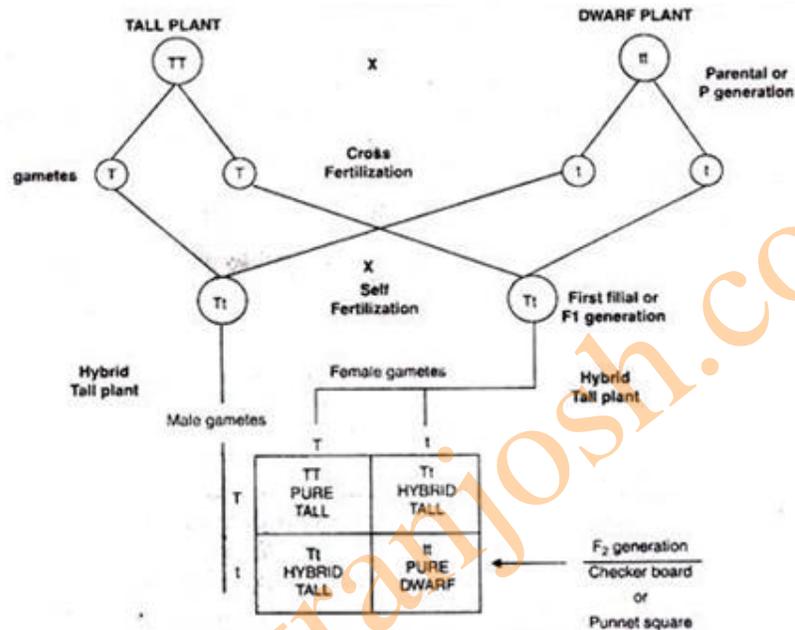
Question 13. (a) What is a test cross? How is it useful to the geneticist?

(b) Write the genotype and phenotype of progenies formed by a cross between a pure tall plants and a hybrid tall plant.

Answer.

(a) A test cross is mating between an unknown genotype with known homozygous recessive, to know whether the unknown member is homozygous or heterozygous. To identify whether an organism exhibiting a dominant trait is homozygous or heterozygous for a specific allele, a scientist can perform a test cross.

(b)



OR

Describe male heterogamety and female homogamety through two suitable examples.

Answer.

There are two types of sex determining mechanisms, i.e., XO type and XY type. But in both cases males produce two different types of gametes,

(a) Either with or without X-chromosome or

(b) Some gametes with X-chromosome and some with Y-chromosome. Such type of sex determination mechanism is designated to be the example of male heterogamety. Eg: cockroaches and grasshoppers

In heterogamy, the total number of chromosome is same in both males and females. But two different types of gametes terms of the sex chromosomes are produced by females. For example birds and dioeciously plants.

Answer is not clear.

Question 14. Which features of tumor causing bacteria *Agrobacterium* makes it suitable as a good cloning vector?

Answer.

Agrobacterium tumefaciens is a Gram-negative bacteria that caused tumors in some plants by horizontal gene transfer of its Ti plasmid. *Agrobacterium* is well known for its ability to transfer DNA between itself and plants, large sized plasmid, has origin of replication, selectable marker, has genes for phytohormones, and restriction endonuclease cleaving sites (MCS). These reasons make it an important tool for genetic engineering.

Question 15. Describe the process of biogas production.

Answer.

In the conventional process of biogas production, the bioorganic material is processed before being fed into the biogas plant. The plant consists of a mixer, two digesters and a gas storage. The digesters are also called fermentation tanks and are the vital components of the plant since they provide the anaerobic conditions in which the bacteria generate biogas. The substrates have to be continuously heated and stirred in order to ensure their homogeneity and the consistent discharge of gas. The gas holder is normally an airproof steel container that, by floating like a ball on the fermentation mix, cuts off air to the digesters and collects the gas generated.

Question 16. Write the source and effect of following:

- (a) Smack
- (b) Cocaine
- (c) LSD

Answer.

(a) Smack: Source- Opium synthesized from morphine extracted from poppy plant.
Effects- Hallucinogenic, feeling of euphoria, dry mouth, clouded mental functioning.

(b) Cocaine: Source- Leaves of Coca plant.
Effects- Hallucinogenic, extreme ecstasy, fast heart rate, sweating, and large pupils.

(c) **LSD:** Source-Ergot fungus.

Effects- Distorts perception of reality by interfering with the brain's ability to selectively store immediate experiences, Hallucinogenic.

OR

(a) **What are autoimmune diseases? Name any two.**

(b) **What is basis for vaccination in human beings? Write the full form of DPT vaccine.**

Answer.

(a) An autoimmune disease develops when your immune system, which defends your body against disease, decides your healthy cells are foreign. As a result, your immune system attacks healthy cells. Depending on the type, an autoimmune disease can affect one or many different types of body tissues.

Examples - Vitiligo and Multiple sclerosis.

(b) The basis of Vaccination is to introduce a mild version of a disease into the body, which stimulates the creation of antibodies and a memory of the pathogen, which results in immunity to the disease. DPT is Diphtheria, Pertussis and Tetanus.

Question 17. What is RNA silencing? Give the example of *Meloidogyne incognita* for the same.

Answer.

The cleaving of siRNAs from dsRNA, siRNAs can associate with RISC, leading to the degradation of the target mRNA. RNA interference (RNAi) or RNA silencing is a biological process in which RNA molecules inhibit gene expression, typically by causing the destruction of specific mRNA molecules.

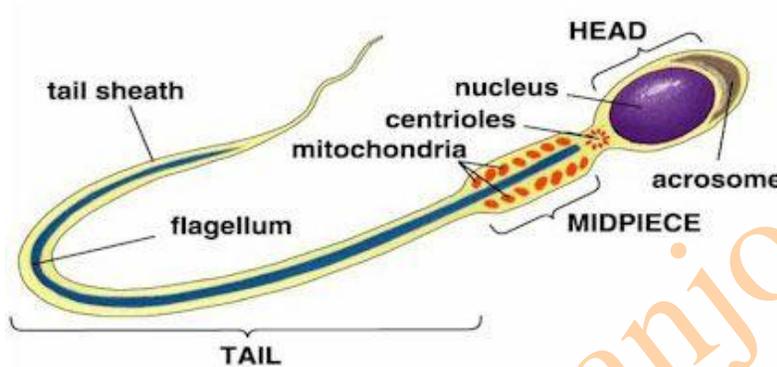
RNA interference's can be used for the root-knot nematode *Meloidogyne incognita*. This method can knock-down the two genes expressed in the subventral esophageal glands of the nematode and potentially involved in parasitism.

Question 18. (a) Draw well labeled diagram of a human sperm.

(b) What will happen if the acrosome of a sperm is removed?

Answer.

(a) Human Sperm:



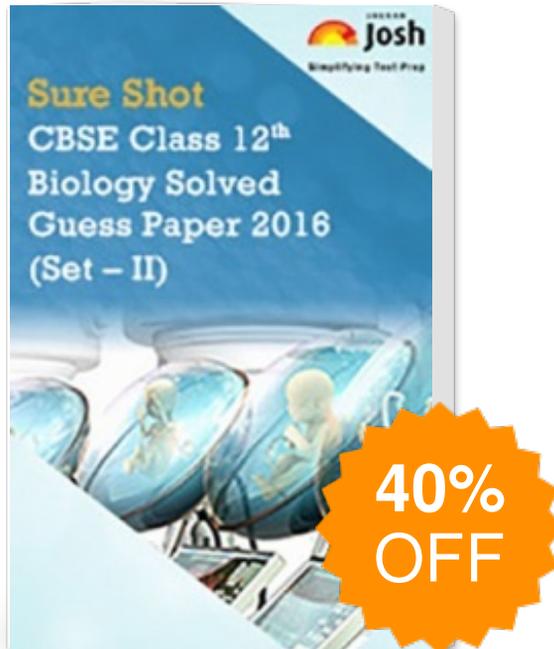
(b) Acrosome contains digestive enzymes that degrade the outer layer of the ovum during fertilization. If it was not present, the ovum would never be penetrated and no fertilization would occur.

Question 19. Explain the three types of natural selection along with their prescribed graphs.

Answer.

Stabilizing selection: A type of selection that eradicates individuals from both ends of a phenotypic distribution, thus maintaining the same distribution mean. Happens when natural selection favors the intermediate states of continuous variation.

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Author : Jagran Josh Expert

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