CBSE 12th Biology 2016 Solved Paper

Outside Delhi

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TIME - 3HR. | QUESTIONS - 26

THE MARKS ARE MENTIONED ON EACH QUESTION

SECTION-A

Q. l. A male honeybee has 16 chromosomes whereas, its female has 32 chromosomes. Give one reason. *1 marks*

Ans. Honey bees have a haploid sex determination system. The females are diploid and have 32 chromosomes and males are haploid and have 16 chromosomes. The males develop by parthenogenesis.

Q. 2. Mention the role of 'genetic mother' in MOET. *1 marks*

Ans. The genetic matter is used for super ovulation in MOET.

Q. 3. What is biopiracy? *1 marks*

Ans. The tumor inducing plasmid of Agrobacterium tumefaciens Ti -plasmid has now been modified into a cloning vector which is no more pathogenic to the plants but is still able to use the mechanism to deliver genes of our interest into a variety of plants. Agrobacterium tamifaciens is a soil bacterium which causes diseases in many dicot plants. It is able to deliver a piece of DNA known as T-DNA, to transform the normal cells into tumor cells and direct these tumor cells to produce the chemicals required by the pathogen.

Q. 4. Mention two advantages for preferring CNG over diesel as an automobile fuel. *1 marks*

Ans. CNG has following advantages:

1. CNG burns most efficiently and very little is left unburnt
2. CNG is cheaper

Q. 5. Write the probable differences in eating habits of homo habilis and homo erectus. *1 marks*

Ans. Homo erectus probably ate meat. Homo habilis probably did not eat meat

SECTION-B

Q. 6. A single pea plant in your kitchen garden produces pods with viable seeds, but the individual papaya plant does not. Explain. *2 marks*

Ans. A pea plant is monoecious and even a single plant produces seeds white papaya is dioecious so an individual pant does not produce viable seeds.

Q. 7. Following are not features of genetic codes. What does each one indicate? Stop codon; Unambiguous codon; Degenerate codon; Universal codon. Stop codon: It includes UAA, UAG and UGA. These codons signal end of protain synthesis. *2 marks*

Ans. (i) Unambiguous: A codon codes for only one amino acid, so, it is unambiguous and specific.

(ii) Degenerate: Some amino acids are coded are coded by more than one codon, so the code is degenerate.

(iii) Universal: The code is nearly universal. For example, from bacteria to human UUU would code for phenylalanine (phe) some exceptions to this rule have been found in mitochondrial codons and in some protozoans.

Q. 8. Suggest four important steps to produce a disease resistant plant through conventional plant breeding technology. *2 marks*

Ans. The four important steps are:

1. Screening germplasm for resistant sources.
2. Hybridisation of selected parents.
3. Selection and evaluation of the hybrids
4. Testing and release of new variants.

Q. 9. Name a genus of baculovirus. Why are they considered good biocontrol agents? *2 marks*

Ans. Baculoviruses are pathogens that attack insects and other arthropods. The majority of baculoviruses used as biological control agents are in the genus - Nucleopoiy - hedrovirus. These viruses are excellent candidates for species-specific, narrow spectrum insecticidal applications.

Importance in organic formic: The use of the chemical fertilisers to meet the ever - increasing demand of agricultural products has contributed significantly to environmental pollution.

The over use of chemical fertilisers is problematic and there is a large pressure to switch to organic farming to use of bio - fertilisers.

Baculoviruses have been shown to have no negative impact on plants, mammals, birds, fish and even non-target insect.

This is useful in overall Integrated Pest Management (IPM).

Q.10. Explain the relationship between CFC's and Ozone in the stratosphere. *2 marks*

Ans. Effects of degradation of ozone:

(1) UV-B damages DNA and proteins of living Organisms causing mutation.

(2) It causes skin ageing, skin cell damage and skin cancer.

OR

Why are sacred groves highly protected?

Ans. The two types of desirable approaches are: Insitu conservation (On site conservation) and Ex situ conservation (off -site conservation).

(a) Insitu conservation- It is conservation and protection of biodiversity in its natural habitat.

(i) Pupulation is conserved in the surroundings where they have developed their distinctive features.

(ii) E.g., national parks, biosphere reserves, wildlife sanctuaries, etc.

(b) Ex- situ conservation- It is conservation of selected threatened plant and animal species in places outside their natural habitat.

(i) Population is conserved under simulated conditions that closely resemble their natural habitats.

(ii) E.g., botanical gardens, zoological parks, wildlife safari, gene banks, etc.

SECTION-C

Q. 11. (a) Name the organic material exine of the pollen grain is made up of. How is this material advantageous to pollen grain? *3 marks*

(b) Still it is observed that it does not form a continuous layer around the pollen grain. Give reason.

(c) How are' pollen banks' useful?

Ans. (a) The exine layer is made up sporollenin, which is one of the most resistant substances found in nature.

The intine layer is made up of cellulose and pectin materials.

(b) Sporopollenin is absent in the region of germ pore. This is because the germ pore acts as a site for exit of the pollen tube at the time of fertiuation.

(c) Pollen banks are used to store pollen grains of a large number of species for years in liquid nitrogen (-196°c). This stored pollen can be used in crop breeding programmes.

OR

(a) Mention the problems that are taken care of by Reproduction and Child Health Care programme.

Ans. The problems that are taken care of by the Reproduction and child Health care programme are:

1. Creating awareness among people about various reproduction related facts.
2. Producing facilities and support for building up a reproductively healthy society.
3. Implementation of better techniques and new strategies from time to time are also required to provide more efficient care and assistance to people.

(b) What is amniocentesis and why there is a statutory ban on it?

Ans. Amniocentesis, also known as Amniotic Fluid Test. It is test that detects chromosomal abnormaltities in the fetus and done after 16^{th} week of pregnancy. A sample of amniotic fluid is taken from the amniotic sac (amnion) surrounding the unborn baby and its DNA is examined for genetic abnormaltities. The fluid carries fetal tissue, it can assess whether the fetus has developed, or might develop a serious health condition or abnormality. The fluid that surrounds the fetus in the womb, the amniotic fluid has cells that the skin of the developing baby has shed, as well as his/her waste products. Each cell from the baby in the fluid contains their complete set of DNA (genetic information). Analyzing these cells helps the doctors assess the 'fetus' health and detect any potential problems.

If a problem is detected, it can sometimes be treated while the baby is still in the womb. The test is done early enough during the pregnancy so that if a serious abnormality is found, the parents have time to decide wether to terminate the pregnancy or see it through. Older mothers, as well as those with a medical history, or women with inherited conditions have a higher risk of giving birth to offspring with a serious health condition or abnormality.

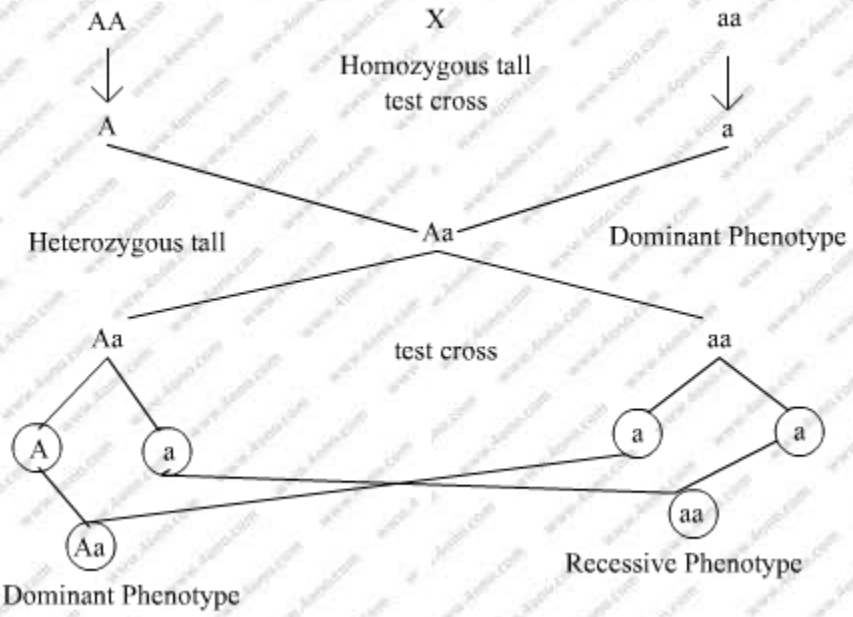
Amniocentesis can detect several conditions, such as:

1. Down's syndrome-The result of an extra chromosome (trisomy-21) which affects the person's physical features, mental development, and ability to learn.
2. Spina bifida and other neural tube defects.
3. Thalassemia- The body's ability to create red blood cells is poor.

There is a statutory ban on amniocentesis because the test can be used to determine the sex of the fetuses and heightens the fear of female foeticide.

Q.12. What is a test cross? How can it decipher the heterozygosity of a plant? *3 marks*

Ans.



Q. 13. (a) What do 'Y' and 'B' stand for in 'YAC' and 'BAC' used in Human Genome Project (HGP). Mention their role in the project. *3 marks*

(b) write the percentage of the total human genome that codes for proteins and the percentage of discovered genes whose functions are known as observed during HGP.

(c) Expand 'SNPs' identified by scientists in HGP.

Ans. (a) The BAC (bacterial artificial Chromosomes and YAC (Yeast artificial chromosomes) represent the host cells used for cloning of DNA fragments using specialized vectors.

(b) Less than 2 percent of the human genome codes for proteins. Less than 50 percent of the discovered genes have their functions known.

(c) SNP: Single nucleotide polymorphism. These are sites for single DNA base differences. SNPS hold promise for location of disease-associated sequences on chromosomes and tracing human history.