

# QB365 Question Bank Software Study Materials

## Zoology - Principles of Inheritance and Variation Important 2 Marks Questions With Answers (Book Back and Creative)

12th Standard

Biology

Total Marks : 40

### 2 Marks

20 x 2 = 40

1) What is haplodiploidy?

**Answer :** Haplodiploidy is a sex determination system in which males develop from unfertilized eggs are haploid, and female develops from fertilized egg and is diploid.

It is sometimes called arrhenotoky.

e.g., Honeybees, ants, and wasps.

2) Distinguish between heterogametic and homogametic sex determination systems

**Answer :**

Heterogametic sex determination	Homogametic sex determination
Produces identical gametes (produces one type of gamete)	Produces two different gametes
Two sex chromosomes of the organism are same (XX) (Females)	Two sex chromosomes of the organism are different (XY) (Males)

3) What is Lyonisation?

**Answer :** The inactivation of an X chromosome one of the two X chromosomes in every cell in some female mammal is randomly inactivated early in embryonic development and named after geneticist Mary Lyon.

The inactive X chromosome is silenced by it being packaged in such a way that it has a transcriptionally inactive structure called heterochromatin found in nucleoplasm of nucleus.

4) What is criss-cross inheritance?

**Answer :** It is the transmission of a gene from mother to son or father to daughter.

These patterns of inheritance are called criss-cross inheritance (or) skip generation inheritance in which a character is inherited to the second generation through the carrier of first-generation.

E.g., Wing color in the magpie moth (*Abraxus*) feather pattern in chickens

5) What are holandric genes?

**Answer :** The genes present in the differential region of Y chromosome are called Y-linked or holandric genes. The Y-linked genes have no corresponding allele on X chromosome. The Y-linked genes inherit along with Y chromosome and they are phenotypically expressed only in the male sex.

6) Mention the symptoms of Phenylketonuria

**Answer : Symptoms:**

1. Severe mental retardation (Phenylpyruvic acid which damages the brain).
2. Light pigmentation (reduction of color) of skin and hair.

7) Mention the symptoms of Down's syndrome.

**Answer : Symptoms:**

1. Severe mental retardation
2. Defective development of the CNS.
3. Increased separation between the eyes.
4. Flattened nose, ears are malformed

5. Mouth is constantly open and the tongue protrudes.

8) What are Gynandromorphy?

**Answer :** Individuals have parts of their body expressing male characters and other parts of the body expressing female characters. The organism is made up of tissues of male and female genotypes and represents a mosaic pattern.

9) Define multiple allelism.

**Answer :** When three or more alleles of a gene that control a particular trait occupy the same locus on the homologous chromosome of an organism, they are called multiple alleles and their inheritance is called multiple allelism.

10) State the allelic forms of I gene and mention its chromosomal location.

**Answer :** The I gene exists in three forms:  $I^A$ ,  $I^B$  and  $I^O$ . The alleles are located on chromosome 9.

11) State Wiener Hypothesis on Rb-factor.

**Answer :** Wiener proposed the existence of eight alleles ( $R^1$ ,  $R^2$ ,  $R^0$ ,  $R^Z$ ,  $r$ ,  $r^1$ ,  $r^{11}$ ,  $r^Y$ ) at a single Rh locus. All genotypes carrying a dominant 'R allele' ( $R^1$ ,  $R^2$ ,  $R^0$ ,  $R^Z$ ) will produce 'Rh-positive' phenotype and double recessive genotypes ( $rr$ ,  $rr^1$ ,  $rr^{11}$ ,  $rr^Y$ ) will give rise to Rh-negative phenotype.

12) Based on Lyon's hypothesis, mention the number of Barr bodies in XXY males, XO females.

**Answer :** XXY males - One Barr body.  
XO females - No Barr body.

13) Complete the equation.

(a) Phenylalanine  $\xrightarrow{A}$  Tyrosine

(b) DOPA  $\xrightarrow{B}$  Melanin

**Answer :** (a) A = Phenylalanine hydroxylase

(b) B = Tyrosinase

14) Explain the term multiple alleles with example.

**Answer :** (i) When more than two alternative forms (alleles) of a gene occupying in the same locus of the homologous chromosome in a population, these are known as multiple alleles.

(ii) ABO blood grouping is a good example for multiple allelism. In this case, more than two i.e, three alleles are present governing the same character.

(iii) Multiple alleles can be found only when population studies are made.

15) What is known as sex determination?

**Answer :** (i) Sex determination is the method by which the distinction between male and female is established in a species at the time of fertilization.

(ii) Sex chromosomes determine the sex of the individual in dioecious or unisexual organisms

16) How many autosomes are found in a single mature human sperm?

**Answer :** 22 chromosomes

17) What is called Karyotyping?

**Answer :** Karyotyping is a technique through which a complete set of chromosome is separated from a cell and the chromosomes are arranged in pairs.

18) Give an example of each of the following cases, where

(a) The sperm is responsible and

(b) The ovum is responsible for sex determination.

**Answer :** (a) In human and drosophila, sperm is responsible.

(b) In certain birds, ovum is responsible.

19) Which of the following disease can be avoided in the progeny analyzing the pedigree of the parents?

**Answer :** Turner's syndrome, colour blindness, tuberculosis Colour blindness.

20) Write the cause of Down's Syndrome.

**Answer :** Down in syndrome is an Autosomal aneuploidy.

Trisomic condition of chromosome 21 results in Down's syndrome