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**12- BIO – BOTANY**  
**SOLUTION AND REFERENCE FOR DOUBTFUL 1 MARK QUESTION**

**CHAPTER 2 CLASSICAL GENETICS**

**3. How many different kinds of gametes will be produced by a plant having the genotype AABbCC?**

- a) Three
- b) Four
- c) Nine
- d) Two

**Solution: d) two**

**Reference: AIPMT 2006**

The plant having genotype AABbCC is heterozygous for only one-character B. Number of "gametes =  $2^n$ ", where n is the heterozygosity." Since  $n = 1$  so 2 gametes will be formed. Those are ABC and AbC. So the two types of gametes will be ABC and AbC.

**13. The epistatic effect, in which the dihybrid cross 9:3:3:1 between AaBb x Aabb is modified as**

- a) Dominance of one allele on another allele of both loci
- b) Interaction between two alleles of different loci
- c) Dominance of one allele to another alleles of same loci
- d) interaction between two alleles of some loci

**Solution: c) Dominance of one allele to another alleles of same loci**

**Reference: AIIMS 1977**

**16. Which of the following explains how progeny can possess the combinations of traits that none of the parent possessed?**

- a) Law of segregation
- b) Chromosome theory
- c) Law of independent assortment
- d) Polygenic inheritance

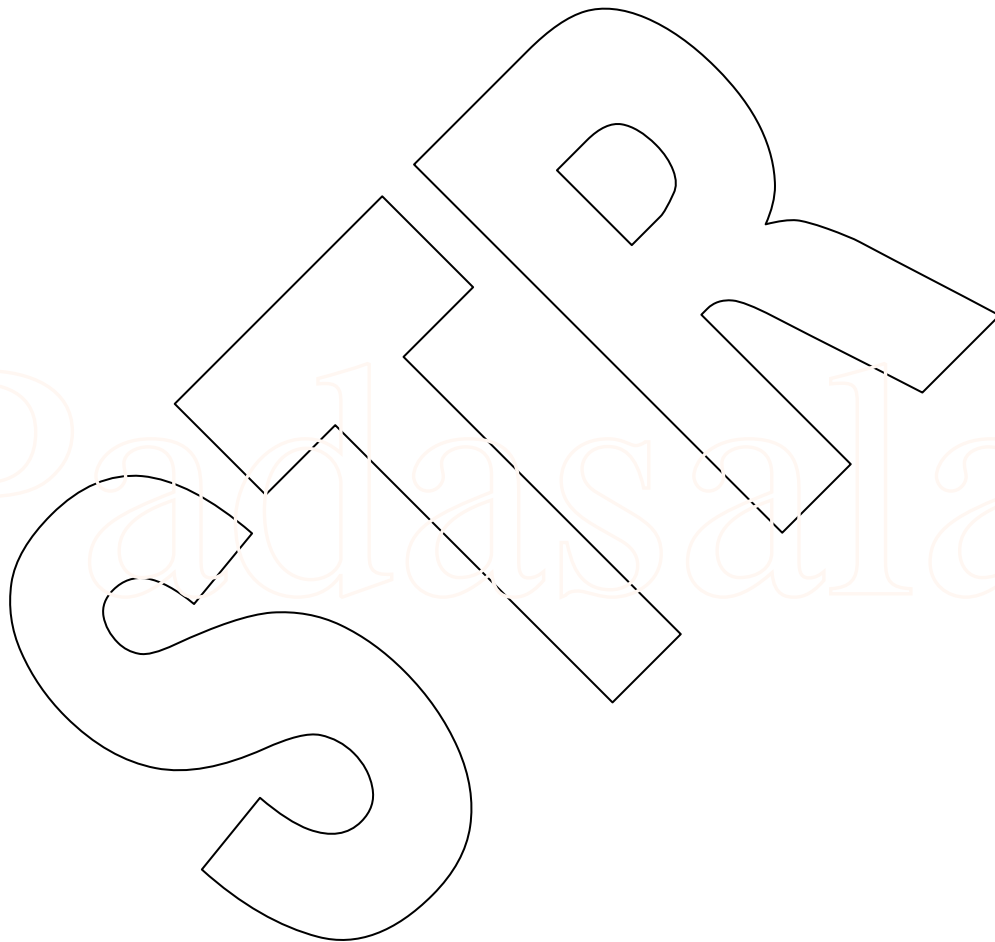
**Solution: b) Chromosome theory**

**Reference: AIIMS 1994**

A polygene is defined as a gene where a dominant allele controls only a unit or partial quantitative expression of a trait. In polygenic inheritance, a cross between two pure breeding parents does not produce dominant trait of one parent but instead an intermediate trait is exhibited. The Law of segregation is the first law of Mendelism. According to it, the two factors of a character which remain together in an individual do not get mixed up but keep their identity distinct, separate at the time

of gametogenesis or sporogenesis, get randomly distributed to different gametes and then get paired again in different offspring as per the principle of probability.

Chromosomal theory of inheritance believes that chromosomes are vehicles of hereditary information, possess Mendelian factors or genes, segregate and assort independently during transmission from one generation to the next. Chromosome theory was proposed by Sutton and Boveri independently in 1902. Law of independent assortment is second law of Mendelism. According to it, the two factors of each character assort or separate independently of the factors of other characters at the time of gamete formation and get randomly rearranged in the offspring.



## CHAPTER 3 CHROMOSOMAL BASIS OF INHERITANCE

### 1. An allohexaploidy contains

- a) Six different genomes
- b) Six copies of three different genomes
- c) Two copies of three different genomes
- d) Six copies of one genome

**Solution: c) Two copies of three different genomes**

The three genomes (A, B and D) of common bread wheat with each of the seven sets of chromosomes from each ancestor. The ancestors were each diploid (two sets of chromosomes) and came together in nature to produce hexaploid wheat.

### 2. The A and B genes are 10 cM apart on a chromosome. If an AB/ab heterozygote is testcrossed to ab/ab, how many of each progeny class would you expect out of 100 total progeny?

- a) 25 AB, 25 ab, 25 Ab, 25 aB
- b) 10 AB, 10 ab
- c) 45 AB, 45 ab
- d) 45 AB, 45 ab, 5 Ab, 5 aB**

**Solution: d) 45 AB, 45 ab, 5 Ab, 5 aB**

-10% recombination frequency

-Means 10% recombinant progeny, 90% parental progeny

- Testcross is Ab/aB X abab

- Results

" Ab = 45% (half of 90% parentals)

" aB = 45% (half of 90% parentals)

" AB = 5% (half of 10% recombinants)

" ab = 5% (half of 10% recombinants)

### 9. If haploid number in a cell is 18. The double monosomic and trisomic number will be

- a) 35 and 37
- b) 34 and 35
- c) 37 and 35
- d) 17 and 19**

**Solution: 34 and 37**

Haploid number = 18

Diploid number = 36

Monosomic  $2N-1 = 36 - 1 = 35$

Double monosomic  $2N-1-1 = 36 - 1 - 1 = 34$

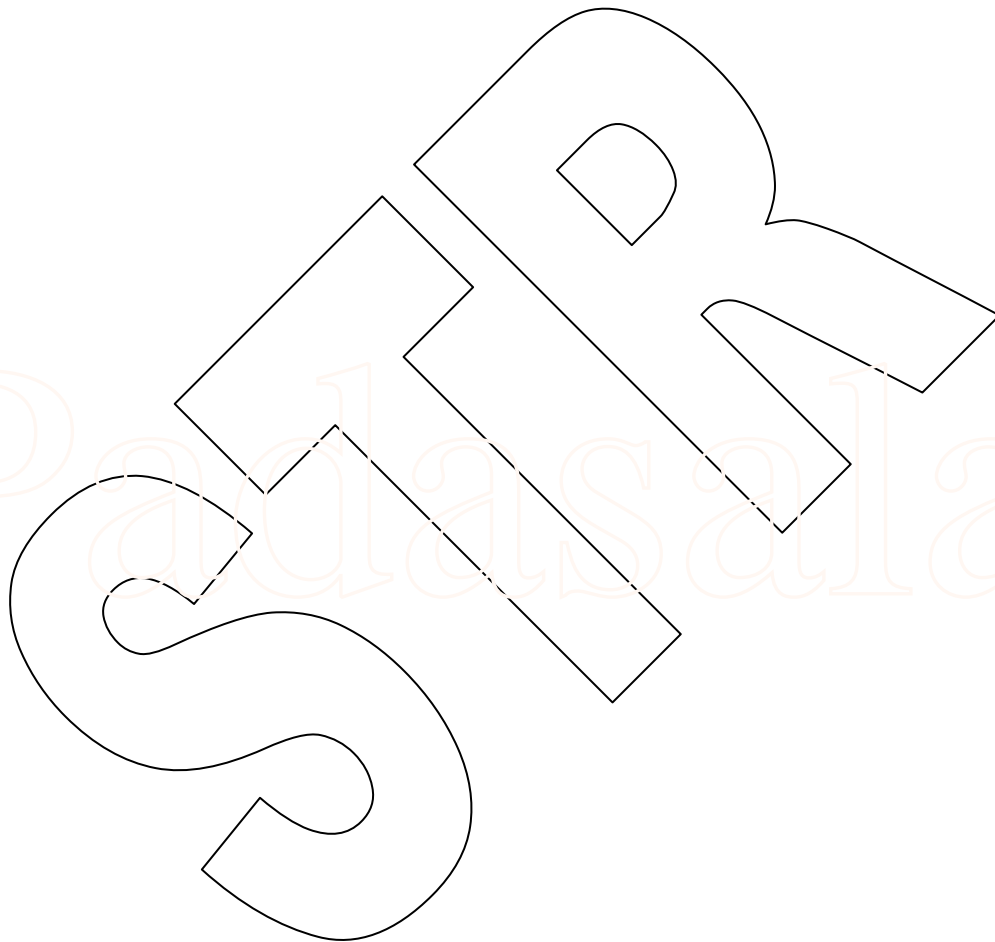
Trisomic  $2N+1 = 36 + 1 = 37$

**12. How many map units separate two alleles A and B if the recombination frequency is 0.09?**

- a) 900 cM
- b) 90 cM
- c) 9 cM**
- d) 0.9 cM

**Solution : c) 9 cM**

**Reference Model Question in Biology** , By Peter Raven and George Johnson and Kenneth Mason and Jonathan



## CHAPTER 6 PRINCIPLES OF ECOLOGY

### 4. Read the given statements and select the correct option.

- i) Hydrophytes possess aerenchyma to support themselves in water.
  - ii) Seeds of *Viscum* are positively photoblastic as they germinate only in presence of light.
  - iii) Hygroscopic water is the only soil water available to roots of plant growing in soil as it is present inside the micropores.
  - iv) High temperature reduces use of water and solute absorption by roots.
- a) i, ii, and iii only
  - b) ii, iii and iv
  - c) ii and iii only
  - d) i and ii only

**Solution: d) i and ii only**

i) True

ii) True

iii) false (Reason - Capillary water is the only water available to plant roots as it is present inside the micropores.)

iv) false (Reason - Low temperature reduces use of water and solute absorption by roots.)

### 6. Read the given statements and select the correct option.

- i) Loamy soil is best suited for plant growth as it contains a mixture of silt, sand and clay.
  - ii) The process of humification is slow in case of organic remains containing a large amount of lignin and cellulose.
  - iii) Capillary water is the only water available to plant roots as it is present inside the micropores.
  - iv) Leaves of shade plant have more total chlorophyll per reaction centre, low ratio of chl *a* and chl *b* are usually thinner leaves.
- a) i, ii and iii only
  - b) ii, iii and iv only
  - c) i, ii and iv only
  - d) ii and iii only

**Solution: a) i, ii and iii only**

i) True

ii) True

iii) True

iv) False (Reason - Shade plant leaves have more total chlorophyll per reaction centre, low ratio of chl *a* to chl *b* and are usually thinner than sun plant leaves.)

**11. The plant of this group are adapted to live partly in water and partly above substratum and free from water**

- a) Xerophytes
- b) Mesophytes
- c) Hydrophytes
- d) Halophytes

**Solution: d) Halophytes**

**Reference: Odisha JEE 2008**

**16. Mycorrhiza promotes plant growth by**

- a) Serving as a plant growth regulators
- b) Absorbing inorganic ions from soil
- c) Helping the plant in utilizing atmospheric nitrogen
- d) Protecting the plant from infection

**Solution: b) Absorbing inorganic ions from soil**

**Reference : UP CPMT 2004**

**17. Which of the following plant has a non-succulent xerophytic and thick leathery leaves with waxy coating**

- a) *Bryophyllum*
- b) *Ruscus*
- c) *Nerium*
- d) ***Calotropis***

**Solution: d) *Calotropis***

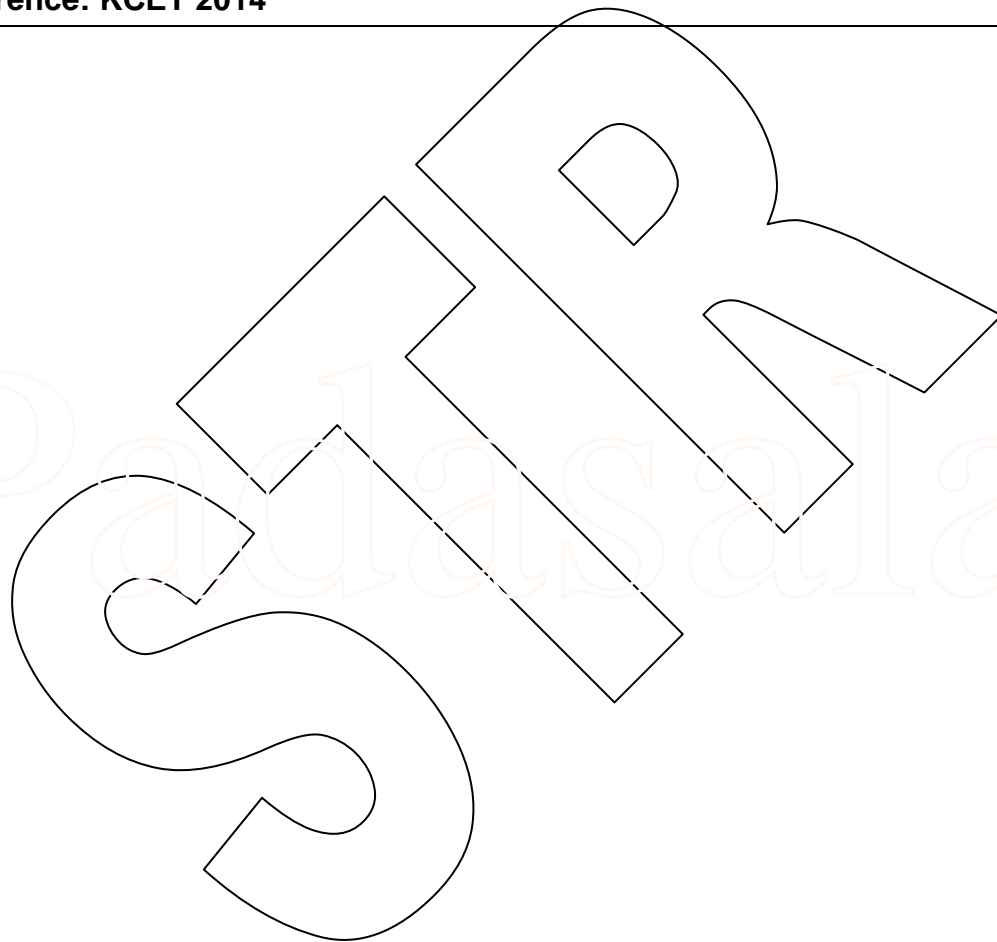
**Reference: EAMCET 1998**

## CHAPTER 8 ENVIRONMENTAL ISSUES

**6. One of the chief reasons among the following for the depletion in the number of species making endangered is**

- a) over hunting and poaching
- b) greenhouse effect
- c) competition and predation
- d) habitat destruction**

<b>Solution: d) habitat destruction</b>
<b>Reference: KCET 2014</b>







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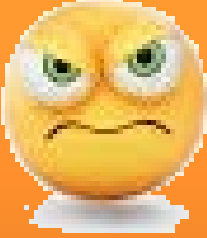


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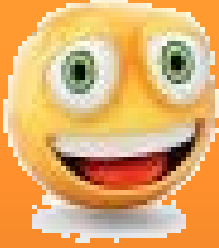


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