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(20516)

Roll No. 1593502692

B.Sc.(Biotech.)-I Year

NS-3459

B. Sc. (Biotechnology) Examination, May 2016

Genetics

(B-105)

(New)

Time : Three Hours]

[Maximum Marks : 50

**Note :** Attempt any *Five* questions. All questions carry equal marks.

1. What do you understand by sex determination ? Describe all theories of sex determination in detail, giving examples of each. 10

2. What is the significance of crossing over (which leads to genetic recombination) to the process of evolution? Describe the cytological observations that suggest that crossing over has taken place. 5+5

3. What are the three modes of recombination in bacteria? Describe each and distinguish among the three modes of recombination, giving one point for each. 1+6+3

(2)

4. Write short notes on the following:

- (a) Barr body 2½
- (b) Polytene chromosomes 2½
- (c) Lampbrush chromosomes 2½
- (d) Pseudoalleles. 2½

5. Describe numerical aberrations of chromosomes with examples studied by you. 10

6. What do you understand by mutations? Differentiate between spontaneous and induced mutations. Describe the role of induced mutations for economic benefit of man. 2+4+4

7. (a) What do you understand by "gene"? Give its classical and modern concept. 5

(b) Describe intra genic crossing over on rII locus in T<sub>4</sub> phage. 5

8. Explain the following:

- (a) Multiple alleles 5
- (b) Epistasis. 5

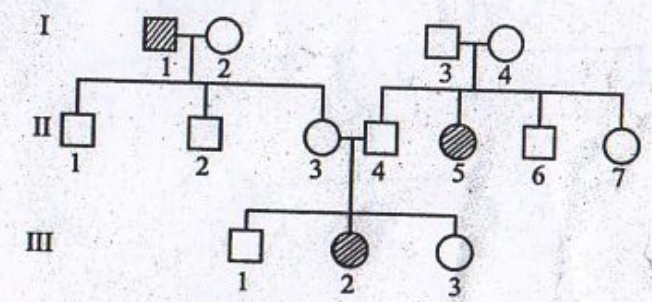
NS-3459

(3)

9. Write short notes on the following:

- (a) Chromosome banding 2½
- (b) Karyotyping 2½
- (c) Euchromatin and heterochromatin 2½
- (d) Interference of genes. 2½

10. Define pedigree? The following pedigree shows the inheritance of myopia in humans. By analyzing the given pedigree, predict whether the disorder is inherited as a dominant or recessive trait. Based on your prediction, indicate the most probable genotype of each individual. 1+2+7



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Roll No. ....

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**Genetics**

**(B-105)**

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*Time : Three Hours ]*

*[ Maximum Marks : 50*

**Note : All** questions carry equal marks. Attempt

any **five** questions.

1. Why Mendel selected pea plant for his study?  
Discuss the law of segregation in detail.

4+6

2. What are multiple alleles? Discuss the inheritance of blood groups in human beings. 10

3. Write detailed notes on the following:

5+5=10

(a) Transformation

(b) Transduction

P.T.O.

4. What do you mean by extra-chromosomal inheritance? Discuss the same giving suitable examples. 10

5. Discuss in detail the Hardy-Weinberg law describing all the assumptions considered there in. 10

6. Write short notes on the following :  
2½ each

(a) Penetrance and expressivity

(b) Lethal factor

(c) Turner's syndrome

(d) Polytene chromosome.

7. Differentiate between the followings:  
2 each

(i) Dominance and epistasis

(ii) Karyotype and idiogram

(iii) Complete and incomplete linkage

(iv) Test cross and back cross

(v) Heterochromatin and euchromatin

8. What do you mean by sex determination and sex differentiation? Discuss the chromosome theory of sex determination in plants. 10

9. Write detail note on the following: 5+5=10  
(i) Lampbrush chromosome  
(ii) Evolution of wheat or cotton

10. What are induced mutations? Discuss the role of induced mutations in crop improvement. 10

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Roll No. R1409 3518 2018

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**NS-3459**

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**Genetics**

**(B-105)**

**(New)**

*Time : Three Hours]*

*[Maximum Marks : 50*

**Note :** Answer any *Five* questions. All questions carry equal marks.

- ✓ 1. Describe Mendel's laws of inheritance with the help of suitable examples. 10
2. Write an essay on ABO blood group inheritance in man. 10
- ✓ 3. Discuss the various syndromes known to be due to numerical changes in chromosomes in human beings. 10

Codominance - Short horn cattle

(2)

~~4~~ Write an essay on mutation. 10

~~5~~ What is sex determination? With suitable examples explain chromosome theory of sex determination. 5+5

6. (a) Describe coupling and repulsion hypothesis. 5  
(b) Give the differences between complementary genes and supplementary genes. 5

~~7~~ Write short notes on the following :  $2\frac{1}{2} \times 4$   
(a) Incomplete dominance  
(b) Factor hypothesis  
(c) Epistasis  
(d) Codominance.

~~8~~ (a) What is Lyon's hypothesis? 5  
(b) What is Karyotype? 5

9. What are chromosomes? Describe nucleosome model of chromosomes. 10

10. What is Karyotype? How the study of karyotype helps in identification of various chromosomal anomalies in man? 10