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13. Write about the methods of production of trisomic and tetrasomic. What is meiotic pairing and utility in chromosome mapping?

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M.Sc.(Biotech.)-I Sem.

Roll No. ....

**NP-3331**

**M. Sc. (Biotechnology) Examination,**

**Dec. 2017**

**Cytogenetics and Molecular Genetics**

**[H-102 (M.Sc.-Biotech.)]**

*Time : Three Hours]*

*[Maximum Marks : 50*

**Note :** Attempt questions from all Sections as per instructions.

**Section-A**

**(Very Short Answer Questions)**

Answer all the *five* questions. Each question carries 2 marks. Very short answer is required not exceeding 75 words. 2×5=10

1. What is C-value paradox ?



(2)

2. What is supercoiling of DNA?
3. Write short note on Unwinding proteins.
4. Write short note on Paracentric inversion.
5. What is a translocation heterocygote?

#### Section-B

##### (Short Answer Questions)

Answer any *two* questions out of the following three questions. Each question carries 5 marks. Short answer is required not exceeding 200 words.  $5 \times 2 = 10$

6. Write a detailed account of packing of DNA as nucleosomes in eukaryotes.
7. What are the different types of RNAs and their roles?
8. Write a detailed note on synaptonemal complex.

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#### Section-C

##### (Detailed Answer Questions)

Answer any *three* questions out of the following five questions. Each question carries 10 marks. Answer is required in detail.  $10 \times 3 = 30$

9. What is the use of mutations based replacement, frame shift and suppressor mutation in deciphering of genetic code.
10. What is DNA replication? Describe in detail the two experiments demonstrating semi-conservative mode of DNA replication.
11. (a) What is the difference between the following paracentric inversion and a pericentric inversion.  
(b) Repetitive and unique sequences.
12. Write down the methods of identification and production of Monosomics. Write the meiotic behaviour of monosomics.

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Roll No. ....

M.Sc. (Bio-Tech.) -I Sem.

**NP-3331**

**M. Sc. (Bio-Technology) Examination,  
November-2019**

**CYTOGENETICS AND MOLECULAR  
GENETICS**

**[H-102]**

**[M.Sc. (Bio-Tech.)]**

*Time : Three Hours]*

*[Maximum Marks : 50*

**Note :** Attempt questions from all Sections as per instructions.

**Section-A**

**(Very Short Answer Questions)**

**Note :** Answer all the *five* questions. Each question carries 2 marks. Short answer should not exceed 75 words. 5×2=10

1. Describe Super-coiling of DNA.
2. Give difference between mitosis and meiosis.
3. What is ZDNA, explain with help of labelled diagram.

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(2)

4. Briefly describe codons of chain initiation and chain termination.
5. Describe overlapping genes.

**Section-B**

**(Short Answer Questions)**

**Note :** Answer any *two* questions out of the following three questions. Each question carries 5 marks. Answer should not exceed 200 words.

$2 \times 5 = 10$

6. Define monosomics and nullisomics and write about their method of production.
7. Describe pseudogenes and cryptic genes.
8. What is synaptonemal complex describe its significance in meiosis ?

**Section-C**

**(Detailed Answer Questions)**

**Note :** Attempt any *three* questions out of the following five questions. Each question carries 10 marks. Answer is required in detail.

$3 \times 10 = 30$

9. Describe experiments which demonstrate the semiconservative mode of DNA replication.

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(3)

10. Describe nucleosome structure and role of histones in nucleosome.
11. Describe different steps in DNA replication in prokaryotes.
12. What are unique and repetitive sequences of DNA. Also explain the possible functions of repetitive sequences.
13. With the help of suitable diagrams describe reduction division.

**NP-3331**



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13. How will you distinguish cytologically:

- (a) Between a paracentric inversion and a pericentric inversion
- (b) Between a translocation homozygote and a translocation heterozygote?

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Roll No. 16938331

M. Sc. (Biotech.)-I Sem.

NP-3331

M. Sc. (Biotechnology) Examination, Dec. 2016

CYTOGENETICS & MOLECULAR GENETICS

[H-102(M. Sc. Biotech.)]

Time : Three Hours]

[Maximum Marks : 50

Note : Attempt questions from all Sections as per instructions.

#### Section-A

#### (Very Short Answer Questions)

Answer all the five questions. Each question carries 2 marks. Very short answer is required not exceeding 75 words.  $2 \times 5 = 10$

Comment upon colinearity between gene and protein.



(2)

2. Write a short note on satellite DNA.

3. Write short note on unwinding proteins.

4. Write a short note on RL model of DNA by Sasisekharan.

5. Comment upon 'inversion act as cross-over suppressor'.

#### Section-B

##### (Short Answer Questions)

Answer any *two* questions out of the following three questions. Each question carries 5 marks. Short answer is required not exceeding 200 words.  $5 \times 2 = 10$

6. Write a detailed note on double reduction.

7. Write a detailed note on synaptonemal complex.

8. Comment upon C-value paradox.

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(3)

#### Section-C

##### (Detailed Answer Questions)

Answer any *three* questions out of the following five questions. Each question carries 10 marks. Answer is required in detail.  $10 \times 3 = 30$

9. What is reduction division? With the help of suitable diagrams, discuss the substages of a prophase-I.

10. What do you understand by reciprocal translocation? Discuss the orientation and breeding behaviour of a translocation heterozygote.

11. Describe in detail the two experiments demonstrating that DNA is the genetic material.

12. What is DNA replication? Describe in detail the two experiments demonstrating semi-conservative mode of DNA replication.

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M.Sc. Biotech.-I Sem.

**NP-3331**

**M.Sc. Biotech. Examination, Dec. - 2020**

**Cytogenetics and Molecular Genetics**

**(H-102)**

**(New)**

**[M.Sc. (Bio-Tech.)]**

*Time : Three Hours ] [Maximum Marks : 50*

**Note :** Attempt **all** the sections as per instructions.

**Section-A**

**Note :** Attempt all **five** questions. Each question carries 2 marks. The answer should not exceed 75 words.

1. Explain how there is non-overlapping in  
✓ Genetic code. 2
2. Discuss anaphasic chromosomal  
✓ movement. 2

**P.T.O.**

3. Differentiate between Pseudogenes and Pseudoalleles. 2
4. What do you understand by C-value paradox? 2
5. Differentiate between kinetochore and Centromere. 2

### **Section-B**

**Note :** Attempt any **two** questions out of **three** questions. Each question carries 5 marks. Answer should not exceed 200 words.

6. Describe structure and function of synaptonemal complex. 5
7. Discuss the role of proteins involved in prokaryotic DNA replication. 5
8. Differentiate between :  
(a) RNA and DNA 2½  
(b) Frame shift and silent mutation 2½



### Section-C

**Note :** Attempt any **three** questions out of the following **five** questions. Each question carries 10 marks. The answer in required in detail.

9. Discuss the role of different histones in organization of nucleosome. Also give an account on phasing of nucleosomes. 10
10. Give a detail account on meiotic pairing and crossing overing in Pericentric inversion heterozygote. 10
11. Illustrate multiple translocation by taking suitable example. 10
12. Differentiate between Nullisomics and Nulliplex. Discuss the method of production and breeding behaviour in Nullisomics. 10

13. Give a detail account on:

- (a) Addition lines 5
- (b) Experimental evidence for DNA as  
genetic material. 5



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M.Sc.(Bio.-Tech.)-I Sem.

**NP-3331(CV-III)**

**M.Sc. (Bio-Tech.)**

**Examination, Dec.-2021**

**Cytogenetics and Molecular Genetics**

**(H-102)**

**[ M.Sc. (Bio-Tech.) ]**

*Time : 1½ Hours ]*

*[Maximum Marks : 50*

**Note :** Attempt questions from **all** Sections  
as per instructions.

**Section-A**

**(Very Short Answer Questions)**

**Note :** Attempt any **two** questions. Each  
question carries 5 marks. Answer is  
required not exceeding 75 words.

2×5=10

1. Write short note on Anaphasic movement.

**P.T.O.**



- ✓ 2. What is position effect?
- ✓ 3. Write short notes on the following
  - (i) Pseudodominance
  - (ii) Pseudocrying
4. Differentiate between the following
  - (i) Nulliplex & Nullisomics
  - (ii) Simplex & Duplex
5. Comment upon repetitive DNA.

### Section-B

#### (Short Answer Questions)

**Note :** Attempt any **one** of the following questions out of the following 3 questions. Each question carries 10 marks. Answer is required not exceeding 200 words.  $1 \times 10 = 10$

6. Give a brief account on double Reduction.
- ✓ 7. What is Nucleosome? How it was discovered?



8. Describe briefly the experimental evidence which led to the DNA as hereditary material.

### Section-C

#### (Detailed Answer Questions)

**Note :** Attempt any **two** questions out of following 5 questions. Each question carries 15 marks. Answer in required in detail.  $2 \times 15 = 30$

9. Give a detailed account on DEFICIENCY with reference Meiotic pairing & phenotypic effect.
- ✓ 10. Discuss and draw figure to illustrate the behaviour of Paracentric inversion in the meiotic cycle. Give its role in evolution.
- ✓ 11. What is translocation? Discuss in detail occurrence & origin of multiple translocation by taking the example of *Oenothera lamarckiana*.



12. What is Genetic code? Give experiments which helped in deciphering genetic code.
13. Discuss different steps of DNA replication in prokaryotes giving role of various enzymes/proteins.