



Name :

Roll No. :

Invigilator's Signature :

CS / M.SC (GE) / SEM-1 / MSGEN-103 / 2010-11

2010-11

CHROMOSOME STRUCTURE & FUNCTION

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following :

10 × 1 = 10

- i) Crosslink configuration when non-sister chromatids of a bivalent come in contact during 1st meiotic division is
 - a) Chiasmata b) Chromomere
 - c) Centromere d) Bivalent.
- ii) The term 'meiosis' was coined by
 - a) Farmer & Moore b) Flaming
 - c) Blackman d) Robertson.
- iii) Wilson and Steven discovered Chromosome Theory of Sex Determination in the year
 - a) 1890 b) 1901
 - c) 1905 d) 1910.



- iv) Beads on a string are known as
- a) Solenoid b) Chromatin
c) Nucleosome d) Histone core.
- v) Which nucleotide participates in DNA methylation ?
- a) Adenine b) Uracil
c) Cytosine d) Guanine.
- vi) 'ZZ-ZW' type of sex determination occurs in
- a) C elegans b) Chicken
c) Snake d) Drosophila.
- vii) Barr body is a type of
- a) Facultative Heterochromatin
b) Constitutive Heterochromatin
c) Euchromatin
d) None of these.
- viii) K-value paradox does not correlate with
- a) Chromosome number
b) Genome size
c) Gene number
d) DNA repeats.
- ix) N-value paradox does not correlate with
- a) Gene number b) DNA contents
c) Gene density d) Genome size.



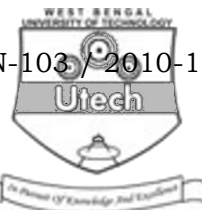
- x) Constitutive remains densely coiled throughout interphase, in all cells.
- a) euchromatin b) heterochromatin
- c) chromatin d) chromosome.
- xi) Lamp brush chromosomes occur in
- a) Nucleus of human cells
- b) Oocytes of frog
- c) Salivary gland may fly larvae
- d) Salivary gland of silk moth.
- xii) Meiosis in Aa Bb will produce gametes
- a) Aa Bb b) Aa bb
- c) AB ab d) AB aB Ab ab.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Explain how chromosomes in Eukaryotes and Prokaryotes are different.
3. What are the criteria of microscopic identification of Human Chromosome ? 3 + 2
4. What is Lyon Hypothesis ? What are Barr bodies ?
5. Explain the role of nucleosome in Gene expression.
6. Explain C-value paradox and Genome complexity.



GROUP – C
(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. Explain the types of chromosome structural variation in Human. How do they make genome unstable ? $4 + 4 + 7$
8. Describe the composition and structure of nucleosome. How do core particles differ from chromosome ? $(5 + 5) + 5$
9. Explain the following terms with examples : 3×5
 - a) Genomic instability caused by transposable elements
 - b) Assessment of linkage in Human pedigrees using Lod scores.
 - c) Molecular structure of Telomere.
10. What is homologous recombination ? What are 'Transposable Elements' ? What are the general characteristics found in many transposable elements in Human Genome ?
 $3 + 3 + 9$
11. What is Molecular Cytogenetics ? How does it help in diagnosis of chromosomal disorders ? What is Array CGH ?
 $5 + 5 + 5$

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