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 : $10 \times 1 = 10$

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. $3 \times 5 = 15$

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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