

This question paper contains 3 printed pages]

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S. No. of Question Paper : 5266

Unique Paper Code : 2234000031

Name of the Paper : GE-22, Classical and Molecular Cytogenetics

Name of the Course : GE-Zoology (NEP-UGCF 2022)

Semester : VIII

Duration : 2 Hours

Maximum Marks : 60

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt four questions in all.

Question Number 1 is compulsory.

All questions carry equal marks.

1. (a) Define the following (any five) :

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(i) Mitosis

(ii) Acrocentric chromosome

(iii) Epigenetics

(iv) Non-disjunction

(v) DNA chip

(vi) Genetic counselling

P.T.O.

(b) Expand the following abbreviations (any *five*) :

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(i) FISH

(ii) ISCN

(iii) NGS

(iv) CRISPR

(v) ddNTP

(vi) qPCR

(c) Fill in the blanks (any *five*) :

5

(i) The process of testing a fetus for genetic or chromosomal abnormalities before birth is called

(ii) A variation at a single position in a DNA sequence among individuals is called a

(iii) The term "chromosome" was first coined by in 1888.

(iv) During Prophase I of Meiosis, the specific structure where crossing over actually occurs is called

(v) is the enzyme used in PCR reaction.

(vi) The karyotype formula for Klinefelter syndrome is

2. (a) Explain the mechanisms of Sex Determination in humans and the role of the SRY gene. 5
(b) Elaborate on the principle, procedure and applications of CGH. 10
3. Explain different types of chromosomal aberrations and their role in genetic disorders. 15
4. (a) Discuss the importance of prenatal diagnosis. 5
(b) Describe the principle and application of DNA microarray. 10
5. (a) Explain the mechanism of CRISPR-Cas9 and its potential in gene editing. 8
(b) What are primers ? Discuss the key features while designing a PCR Primer. 7
6. Write short notes on any *three* of the following : 3×5
 - (i) FISH
 - (ii) Karyotyping
 - (iii) Microsatellites
 - (iv) Genomic instability.

