



Registration No:
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 2nd SEMESTER REGULAR EXAMINATIONS, SEPT/OCT 2019-20

PBG-121

FUNDAMENTALS OF GENETICS

Time : 2 Hours

Maximum : 50 Marks

(Answer **all** questions of Section – A)

SECTION – A

Q.1 Fill up the Blanks with suitable and meaningful word. [10 × 0.5 = 5]

- The base sequence of RNA which pairs with codon of mRNA during translocation is called -----.
- Based on the genic balance theory, you would predict that a human with XXY sex chromosomes and a normal number of autosomes would be _____.
- _____ Blood group is accepted as the universal donor.
- $2n + 1$ represents _____ individuals in aneuploidy.
- Many primary transcripts of non-coding RNAs must be _____ in order to be functional
- Chromosome breakage and rotation by 180° with reunion is called _____
- Longest phase in cell division is _____.
- DNA polymerase I was characterised in *E. Coli* by _____ in .
- The location where the lactose repressor binds to the lactose operon is called _____.
- Two completely linked genes show _____ percent crossing over.

Q.2. Define or Explain the following in one or two sentences [5 × 1 = 5]

- Test cross
- Nucleotides
- Epistasis
- Cytoplasmic
- Repulsion phase of linkage

Q.3. Match the followings [10 × 0.5 = 5]

Group-A	Group –B
i) -1Purine base	a) Diakinesis
ii) Monosomic	b) Equational division
iii) Hugo De Vries	c) Guanine
iv) Mitosis	d) $2n+2$
v) Chromosomes begin to pair	e) Mutation
vi) Tetrasomic	f) Theory of acquired characters
vii) Darwin	g) Thymine
viii) Meiosis	h) Leptotene
ix) Pyrimidine base	i) $2n-1$
x) Bivalents distributed throughout the cell	j) Reductional division



Q.4. Write **TRUE** or **FALSE** against the following statements

[$10 \times 0.5 = 5$]

- i) Cytoplasmic inheritance exhibits maternal effects.
- ii) The continuously replicating strand of DNA is called Sense strand.
- iii) Duplication arise due to equal crossing over.
- iv) The genetic constitution of a human klinefelter syndrome is XXY.
- v) Haploids developed from a normal diploid species are called Monohaploids.
- vi) Monozygotic twins are always identical.
- vii) In DNA, Uracil is present in place of Thymine.
- viii) The somatic chromosome number of Maize is 10.
- ix) In F₁ population, the individuals are heterozygous and the population is homogeneous
- x) Sex chromosomes are called as autosomes.

SECTION – B

(Attempt any **five** questions. Each question carries equal marks)

5x6=30

- Q.5 DNA replication is Semi-conservative and bidirectional. Discuss with the experiment that confirms it and the enzymes involved in replication.
- Q.6 Write short notes of the followings;
- i) Criss-cross inheritance
 - ii) Multiple factor hypothesis
- Q.7 What is cytological basis of crossing over. Explain with examples of *Drosophila*
- Q.8 What do you mean by Protein synthesis? Discuss in brief the process of Transcription and Translation of Central Dogma.
- Q.9 What type of modified dihybrid ratios are related to the following gene actions. Explain with suitable examples.
- i) Supplementary Gene action
 - ii) Complementary Gene action
- Q.10 Why Mendel had selected Garden pea as his experimental material and what were the reasons of Mendel's success for put-forthing the laws of inheritance.