[Time: 3 Hours] **[Marks:100]**

Please check whether you have got the right question paper.

N.B:
1. **All questions are compulsory.**
2. **Figures to the right indicate full marks.**
3. **Draw neat and labeled diagrams wherever necessary.**

Q.1A) Fill in the blanks by choosing the correct option given in the brackets: **05**

i) The criss-cross pattern is observed in _____ inheritance.
(Autosomal recessive, Y-linked recessive, X-linked recessive)

ii) _____ chromosome was first discovered by Walther Fleming.
(Autosomal, Lampbrush, Polytene.)

iii) The part of DNA specifying a single polypeptide chain is termed as _____.
(cistron, recon, muton)

iv) Avery's experiments demonstrated that _____ molecule is responsible for bacterial transformation.
(DNA, RNA, protein)

v) _____ codon signals the end of the protein or polypeptide chain.
(stop, start, polar)

Q.1B) Match the Column I and Column II and rewrite: **05**

Column I	Column II
i. Genic balance theory	a. Wobble hypothesis
ii. Mary Lyon	b. 15:1
iii. Widow's peak	c. C. B. Bridges
iv. Double dominant epistasis	d. Inactivation of X chromosome
v. Francis Crick	e. Dominant trait

Q.1C) Mention whether the given statements are True or False: **05**

i) There are 46 pairs of chromosomes in humans.
ii) XX-XO mechanism of sex determination is observed in grasshoppers.
iii) Antibodies present in the serum of a person with blood group A will agglutinate the RBCs of any other group.
iv) The H-DNA is a triplex consisting of three strands.
v) Beadle and Tatum proposed the one gene-one enzyme hypothesis.

Q.1D) Answer in <u>one or two</u> sentences only: **05**

i) Define karyotype.
ii) Define the term 'intersex'
iii) Define back cross.
iv) What is a wild type allele?
v) Define the terms 'codon' and 'anticodon'.

Q.2A) Answer <u>any one</u> of the following: **10**

i) Give a detailed account of multiple alleles and explain with respect to coat colour in rabbit.
ii) Define epistasis. Explain double dominant epistasis.

Q.2B) Answer <u>any two</u> of the following: **10**

i) Explain classical concept of gene.
ii) Describe inheritance of lethal alleles.
iii) Briefly discuss polygenic inheritance.
iv) Explain briefly complete linkage.

Q.3A) Answer <u>any one</u> of the following: **10**

i) Classify chromosomes based on the position of the centromere.
ii) Explain the pattern of inheritance of colour blindness in man.

Q.3B) Answer <u>any two</u> of the following: **10**

i) Briefly describe the polytene chromosomes.
ii) Explain the phenomenon of parthenogenesis.
iii) Write a explanatory note on autosomes.
iv) Discuss the role of environmental factors in sex determination.

Q.4A) Answer <u>any one</u> of the following: **10**

i) Explain the statement "DNA replication is bidirectional in nature and continuous in one strand and discontinuous in another."
ii) Give an account of the structure and functions of different types of RNA.

Q.4B) Answer <u>any two</u> of the following: **10**

i) Describe in brief the salient features of double helical structure of DNA.
ii) Give a brief account of the different types of extranuclear DNA.
iii) Describe the process of termination of polypeptide synthesis.
iv) Discuss the Griffith transformation experiments.

Q.5 Write short note on <u>any four</u>: **20**

i) Monohybrid cross.
ii) Types of crossing over.
iii) ZZ- ZW mechanism of sex determination.
iv) Sex influenced genes.
v) RNA as a genetic material.
vi) Regulation of lac operon.
