[This question paper contains 4 printed pages.]

221   *Your Roll No. ....*

B.Sc. Prog. / II   C

LS-204 – GENETICS, GENOMICS AND MOLECULAR BIOLOGY

Time : 3 Hours   *Maximum Marks : 75*

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

Question No. 1 is compulsory.
*Attempt **Five** questions in all.*
All *questions carry equal marks.*

1. (a) Attempt any **five** of the following :

    (i) What kind of interaction of genes is exhibited by blood group inheritance in human beings ?

    (ii) What would be the sex of *Prosophila* with 2X chromosomes and 3 sets of chromosomes ?

    (iii) What advantages Mendel had while working with garden pea ?

    (iv) Why are there more colour blind men than women ?

P.T.O.

(v) Indicate the number of Barr bodies in enter phase cells of the individuals with :

(a) Kline felter syndrome

(b) Turner syndrome

(vi) Why is the genetic code a triplet code ?   (5)

(b) Define any **five** of the following :

(i) Chiasma

(ii) Polygenic inheritance

(iii) Lethal genes

(iv) Monosomic

(v) Reciprocal Cross

(vi) Law of Dominance   (5)

(c) Write major contributions of any **five** :

(i) Hershey and Chase

(ii) C.B. Bridges

(iii) H.G. Khurana

(iv) Sinnot. Dunn and Dobzhansky

(v) F. Griffith

(vi) T.H. Morgan   (5)

2. Write short notes on any **five** :

    (i) Kappa particle inheritance

    (ii) Frame shift mutations

    (iii) Chemical mutagens

    (iv) Gynandromorph

    (v) Okazaki fragments

    (vi) Polytene chromosomes/Lampbrush chromosome

    (vii) Crossing Over   (15)

3. Differentiate between any **five** :

    (i) Inversion and translocation

    (ii) Cistron and Intron

    (iii) Test Cross and Back Cross

    (iv) Karyotype and Idiogram

    (v) DNA polymerase and RNA polymerase

    (vi) Euploidy and Aneuploidy   (15)

4. (a) In sweet pea plant, white flower is recessive to
        red and short pollenes recessive to long pollen.
        Red, short is crossed with pure white long. The F_1
        is again crossed with white, short the offsprings
        are as follows :

                                                    P.T.O.

Red flowers, long pollen   – 685

Red flowers, short pollen   – 28

White flowers, long pollen   – 22

White flowers, short pollen   – 150

Give the genotypes of P and F_1 and crossover classes of gameter produced by F_1. Calculate the distance between white and short pollen. What would have been the proportion of different phenotypes of there had been independent assortment of genes. (10)

(b) With the help of labelled diagram only, enumerate the elongation cycle of protein synthesis in prokaryotes. (5)

5. (a) What is cancer ? Briefly write about the types of cancer. (10)

(b) With the help of labelled diagrams, describe Holliday's mode of genetic recombination. (5)

6. (a) What are repressible and inducible systems ? Explain the positive and negative controls of lac aperon. (10)

(b) Explain the type of interaction of genes with reference to the phenotypic ratio of 9:7. (5)