

[This question paper contains 4 printed pages.]

1921

Your Roll No.

B.Sc. Life Science Part II

E

GENETICS, GENOMICS AND MOLECULAR BIOLOGY

LS - 204

Time : 3 Hours

Maximum Marks : 75

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

*Attempt five question in all, including
Question No.-1 which is compulsory.*

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

- (i) Chiasma
- (ii) Polygenic inheritance
- (iii) Lethal genes
- (iv) Monosomic
- (v) Back Cross
- (vi) Law of Segregation (5)

(b) Attempt any five of the following:

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

P.T.O.

- (ii) What would be the sex of *Drosophila* 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?
 - (v) Indicate the number of Barr bodies in inter phase cells of the individuals with:
 - (a) Kline felter syndrome
 - (b) Turner syndrome
 - (vi) Why is the genetic code a triplet code? (5)
- (c) Write major contributions of any five:
- (i) Alfred Hershey and Martha Chase
 - (ii) C.B. Bridges
 - (iii) H.G. Khurana
 - (iv) E.W. Sinnott, L.C. Dunn and Th. Dobzhansky
 - (v) F. Griffith
 - (vi) T.H. Morgan (5)
2. (a) What are repressible and inducible systems? Explain the positive and negative controls of lac operon. (10)

- (b) Explain the type of interaction of genes with reference to the phenotypic ratio of 9:7. (5)
3. Write short notes on any five :
- (i) Kappa particle inheritance
 - (ii) Frame shift mutations
 - (iii) Chemical mutagens
 - (iv) Gynandromorph
 - (v) Okazaki fragments
 - (vi) Lampbrush chromosome
 - (vii) Crossing over (15)
4. (a) What is cancer? Add a note on the types of cancer. (10)
- (b) With the help of labelled diagrams, describe Holiday's mode of genetic recombination. (5)
5. 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)

6. (a) In sweet pea plant, white flower is recessive to red and short pollen 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:

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 gametes produced by F_1 . Calculate the distance between white and short pollen. Give the proportion of different phenotypes if 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)

(100)