is question paper contains 4 printed pages.

Your Roll No. .....

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No. of Ques. Paper : 5090

nique Paper Code : 216555

me of Paper : Genetics and Genomics (LSPT-512)

me of Course : B.Sc. (Prog.) Life Sciences

mester : V

ration : 3 hours

aximum Marks : 75

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

Attempt five questions in all, including Question No. 1 which is compulsory.

All questions carry equal marks.

(a) Define (any *five*):

(i) Barr body

(ii) Pseudodominance

(iii) Missense mutation

(iv) Proteomics

(v) Dicentric chromosome

(vi) Conditional lethal mutation. 1×5=5

(b) Give one contribution of (any *five*):

(i) Barbara McClintock

(ii) W. Sutton and T. Boveri

(iii) Calvin Bridges

(iv) Craig Venter

(v) Alfred Sturtevant

(vi) Mary Lyon.

(c) Fill in the blanks:

(i) Linkage between the genes can be detect deviation from the Mendel's principle of .....

(ii) Allele for color-blindness is located on ..... chrom

(iii) The phenomenon of bringing about equality products synthesized under the control of the carried on X-chromosomes is called as .....

(iv) The X and Y chromosomes in *Melandrium* have a common ..... segment.

(v) When a gene affects many aspects of phenotyp said to be ..... .

2. Write short notes on (any *three*):

(a) Lyon hypothesis

(b) Inheritance pattern of white eye color in *Drosophil*

(c) Allopolypoidy

(d) Shot gun sequencing

(e) Chi Square Analysis.

3. Differentiate between (any *five*):

(a) Inversion and Translocation

(b) Complete and Incomplete linkage

(c) Codominance and Incomplete dominance

(d) Penetrance and Expressivity

(e) Dominance and Epistasis

(f) Test cross and Reciprocal cross. 3×5=15

(a) A pure dextral female snail is crossed with a pure sinistral male snail. Give the genotype and phenotype of F_1, F_2 and F_3 progeny with reasons. 10

(b) Write down the common features of model organisms. Discuss *Arabidopsis thaliana* as a model organism in genetic study. 5

(a) In sweetpea the dominant allele R causes purple flower and recessive allele *r* causes red flower in homozygous condition. The dominant allele L causes long pollen grain, and recessive allele *ℓ* causes round pollen grain in homozygous condition. In F_2 generation from a cross between double heterozygous purple flowered plant with long pollen grains and a red flowered plant with round pollen grain, the following results were obtained:

Purple flower, long pollen grain	296
Purple flower, round pollen grain	19
Red flower, long pollen grain	27
Red flower, round pollen grain	85

Give the genotypes of parents and progenies. Calculate recombination frequency. 8

(b) Give the cause and symptoms for Klinefelter syndrome. 5

(c) What is the phenotype of a person who has:

(i) XY with SRY genes deleted

(ii) XXV with SRY genes deleted? 2

6. (a) What are physical mutagens? Discuss the role of i and non-ionizing radiations in inducing mutation.

(b) Explain the Celera genomics project and the seq methodology used in the project.

7. (a) What is Pedigree Analysis? Explain the inheritance of X- recessive inheritance with the help of a suitable exam

(b) Explain why the recombination frequency never exceeds 5

(c) Give the number of barr bodies present in an individu chromosomal constitution XXXXYY and XXYY.