

VIJAYA COLLEGE

R.V Road, Basavanagudi, Bengaluru-560 004

VI Semester B.Sc., MODEL QUESTION PAPER

Subject: GENETICS

Paper-GNT 601: DEVELOPMENTAL AND EVOLUTIONARY GENETICS

Max.Marks: 70

Time: 3 Hrs

PART – A

I Answer any FIVE of the following:

(5x3=15)

- 1.What is gene pool?.
- 2.Define genotype frequencies?
- 3.What is random drift?
- 4.What is continuous quantitative characters?
- 5.Define fitness?
6. Mention the types of evolutionary agents involved effects Hardy –Weinberg law?
- 7.What is meristic quantitative characters?.

PART – B

II Answer any FIVE of following:

(5x5=25)

- 1.Explain Transgressive inheritance with a suitable example.
- 2.Write a note on the significance of polygenic inheritance in animal breeding.
- 3.Differentiate between polygenic trait and oligogenic trait.
- 4.Explain how environmental effects the quantitative characters and inheritance.
- 5.How regression and correlation are different in biometrical genetics.
6. Explain ear length in corn with reference to quantitative trait.
- 7Calculate different types of variances for the following data

Generation	Mean	Phenotypic Variance
P1	13.0	11.04
P2	27.6	10.32
F1	18.5	5.24
F2	21.2	40.35
B1	15.6	17.35
B2	23.4	34.29

PART – C

III Answer any ONE of following:

(10x1=10)

1. Explain inheritance of Kerenel color in wheat.
- 2.What is heritability?Explain its types.

PART – D

IV Answer any ONE of following:

(10x1=10)

1. Explain types of variances in polygenic traits.
- 2.State and explain the law of Hardy-Weinberg principle.

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PART – A

I Answer any FIVE of the following:

(5x3=15)

- 1.What is migration in population genetics?.
- 2.Define gene frequencies?
- 3.What is gametic fitness?
- 4.What is threshold characters in quantitative characters?
- 5.Define regression?
6. State Hardy –Weinberg law?
- 7.Expand ANOVA?.

PART – B

II Answer any FIVE of following:

(5x5=25)

- 1.Explain skin color inheritance in human
- 2.Write a note on the QTL.
- 3.Differentiate between broad sense heritability and narrow sense heritability .
- 4.What is correlation ?Mention its type.
- 5.Explain the features of polygenic traits in relation to oligogenic traits..
6. Explain the type of inheritance when two medium red heterozygous are crossed.
- 7 In a population of which 49% are homozygotes with genotype "tt".Find out the gene frequency of allele 'T' and't'.

PART – C

III Answer any ONE of following:

(10x1=10)

1. Explain the various methods of estimation of heritability.
- 2.Give a detail account on Hardy-Weinberg principle

PART – D

IV Answer any ONE of following:

(10x1=10)

1. When a black mexian sweet corn with mean ear length of 6.63cm was crossed with tomb popcorn of mean length 16.80cm, the F1 had mean length of 12.12cm.Find out F2 result if character is controlled by 2pairs of genes .
- 2.Explain the various types of variances.

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Instructions: i) Draw diagrams wherever necessary

PART - A

I Answer any **five** of the following: 5X3=15

1. Explain nuclear transplantation experiment in *Acetabularia*.
2. Discuss about maternal genes in *Drosophila*
3. What is speciation? Mention its methods.
4. Differentiate between gene and genotype frequencies
5. What is gene pool?
6. Discuss on continuous quantitative characters.
7. What is fitness?

PART - B

II Answer any **five** of the following: 5X5=25

8. Explain differential expression of haemoglobin genes.
9. Explain floral morphogenesis of *Arabidopsis*.
10. Differentiate between Darwinism and Neo- Darwinism.
11. Explain the mechanism of isolation.
12. Explain transgressive inheritance with a suitable example.
13. Give the factors of polygenic traits in relation to oligogenic trait.
14. Illustrate environmental effects with reference to quantitative characters and inheritance.

PART - C

III Answer any **two** of the following: 2X10=20

15. Describe the development of Dorso-Ventral polarity in *Drosophila*.
16. Explain a) Lamarckism b) Tissue specific methylation
17. Explain heritability with its types.
18. Explain a) fate mapping) segmentation genes in *Drosophila*

PART - D

III Answer any **one** of the following: 1X10=10

19. Describe in detail evolution at molecular level.
20. State and explain Hardy - Weinberg principle.

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Time: 3Hours

Max Marks: 70

Instructions: i) Draw diagrams wherever necessary

PART - A

I Answer any **five** of the following: 5X3=15

1. What is fate mapping?
2. Explain nuclear transplantation experiment in Amphibians.
3. Discuss about maternal genes in *Drosophila*
4. What is natural selection?
5. Explain gene and genotype frequencies
6. Write a note on founder principle.
7. Discuss on continuous quantitative characters.

PART - B

II Answer any **five** of the following: 5X5=25

8. Explain ABC model of Arabidopsis.
9. Explain differential expression of haemoglobin genes.
10. Discuss briefly about mutation theory.
11. Explain the mechanism of speciation.
12. Explain transgressive inheritance with a suitable example.
13. Write a note on significance of polygenic inheritance in animal breeds.
14. Illustrate environmental effects with reference to quantitative characters and inheritance.

PART - C

III Answer any **two** of the following: 2X10=20

15. Describe the development of Anterio- Posterior polarity in *Drosophila*.
16. Explain a) Genetic drift b) Types of isolation.
17. Explain heritability with its types.
18. Explain a) fate mapping) segmentation genes in *Drosophila*

PART - D

IV Answer any **one** of the following: 1X10=10

19. Describe variances in polygenic traits and explain.
20. Explain ear length in corn with reference to quantitative trait.

