VIJAYA COLLEGE

R.V Road, Basavanagudi, Bengaluru-560 004

II Semester B.Sc., MODEL QUESTION PAPER

Subject: GENETICS

Paper-GNT 201: PRINCIPLES OF GENETICS

Max.Marks: 70

Time: 3 Hrs

PART – A

I Answer any FIVE of following: **(5x3=15)**

1.What are multiple alleles.
2.Define epistasis
3.Write a note on plieotropy
4.Differentiate between intersexes and super sexes in Drosophila
5.Define hypostasis.
6. Explain flower colour in *Mirabilis Jalapa.*
7.Explain eye colour in Drosophila.

PART – B

II Answer any FIVE of following: **(5x5=25)**

1.Illustrate Bridges genic balance theory.
2.Explain hormonal control of sex determination.
3.What are non-epistatic interallelic gene interaction give a suitable example.
4.Explain sex differentiation in man.
5.Write short notes on erythroblastosis featolsis.
6. Describe sex determination in melandrium.
7.With suitable example explain incomplete dominant interaction.

PART – C

III Answer any ONE of following: **(10x1=10)**

1. Explain dosage compensation in man.
2.Describe gene interaction in *Lathyrus odoratus*

PART – D

IV Answer any ONE of following: **(10x1=10)**

1. Explain non –allelic gene interaction in fowls.
2.Describe ABO Blood group.

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PART – A

I Answer any FIVE of following: **(5x3=15)**

1. Give the salient features of multiple alleles.
2. Define gene interaction.
3. Write a note on incomplete dominance.
4. Differentiate between back cross and test cross.
5. Define recessive epistasis
6. What are intra allelic gene interaction? Give a suitable example.
7. What are free martin.

PART – B

II Answer the FIVE of following: **(5x5=25)**

1. Explain gynandromorphs and its types.
2. Explain of sex determination in Melandrium .
3. With suitable example dominant epistatic gene interaction .
4. Explain sex differentiation in Drosophila.
5. Give a note on environment method of sex determination
6. Write a note on Rh factor.
7. With a suitable example explain hormonal method of sex determination.

PART – C

III Answer the ONE of following: **(10x1=10)**

1. Explain dosage compensation in man.
2. Describe coat color gene interaction in mice.

PART – d

IV Answer the ONE of following: **(10x1=10)**

1. Explain types of sex determination .
2. Describe supplementary gene interaction for comb pattern in fowls.

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Time: 3Hours   Max Marks: 70

Instructions: i) Draw diagrams whereever necessary

PART - A

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

1. Define genetics and heredity.
2. State law of independent assortment.
3. Give an example of pure lines and inbred lines.
4. Write the formula for variance and standard deviation.
5. Explain merits and demerits of mean.
6. What is epistasis?
7. Briefly explain sex determination mechanism in *Bonelliaviridis*

PART - B

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

8. Explain theory of inheritance of acquired characters
9. In guinea pigs rough coat R is dominant over smooth coat R and black coat B over b. find the phenotypic and genotypic ration of the cross. rrBBXRrBb
10. Explain addition rule of probability with example.
11. What is dominant epistasis? Give a suitable example.
12. Explain genic balance theory of bridges in Drosophila
13. Discuss dosage compensation in man.
14. Explain the XX-XY and ZZ-ZW type of sex determination.

PART - C

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

15. Describe a) Incomplete dominance b) Supplementary gene interaction

16. Calculate mean, median and mode for the following data.

Age	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60
Frequency	50	70	100	180	150	120	0	60

17. a) What is t test? Mention its application in genetics

b) What is the probability of getting two heads on three tosses of a fair coin.

18. a) Explain mutation theory.

b) Explain Co-dominance with example.

PART - D

IV Answer any **one** of the following: 1X10=20

19. Describe in detail ABO type of blood groups and Rh Fctor in humans.
20. Explain a) free martin b) genic balance theory of bridges.

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Time: 3Hours   **Max Marks: 70**

Instructions: i) Draw diagrams whereever necessary

PART - A

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

1. Explain Epigenetic theory
2. Differentiate between genotype and phenotype.
3. What is back cross? Give example.
4. Write the formula for mean and median for continuous series.
5. Explain complementary gene interaction.
6. What are Gynandromorphs
7. Explain sex determination in man

PART - B

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

8. Explain the role of environment on phenotype and genotype
9. Describe the dihybrid cross with respect to pea plant.
10. Differentiate between dominant and recessive epistasis.
11. Mendel found the following number for the colour of the unripe pods of pea plant in F2 generation. They are 428 green and 152 yellow out of the total of 580. As might be expected for 3:1 ratio, the plants should have been 435 green and145 yellow. Find out the χ2 value and test whether this ration is good to fit or not
12. Explain the role of Y chromosome in sex determination in Melandrium
13. What is multiplication rule pf probability? Explain with example.
14. Explain the XX-XY and XX-XO type of sex determination.

PART - C

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

15. Describe a) Pangenetic theory b) Supplementary gene interaction
16. Explain a) Incomplete Dominance
  b) In guinea pigs, rough coat R is dominant over smooth coat r, and black coat B is dominant over white b. R and B are independent genes. Cross a homozygous rough black animal with a smooth white one. What will be the appearance of the F_1: of the F_2: of the offspring of a cross of the F1 back with rough black parent: with the smooth white one
17. a) What is t test? Mention its application in genetics
   b) mention the merits and demerits of median.

18. a) Explain mutation theory.
   b) Explain co-dominance with example.

PART - D

III Answer any **one** of the following: 1X10=20

19. Describe in detail about biography of Gregor Mendel.

20. Explain a) free martin

         b) genic balance theory of bridges.