

**Avinashilingam Institute for Home Science and Higher Education for Women
[Deemed to be University] Coimbatore-641 043**

Bachelor's Degree Examination November - 2018

III Semester

**Class : II UG
Major : Biochemistry and Biotechnology**

**Time : 3 hours
Max. Marks: 100**

15BBTC06 Genetics

Part A

(10 x 1 = 10)

Choose the correct answer

1. The alternate form of gene is called-----
a) homozygous b) heterozygous c) allele d) recessive
2. A cross in which parents differ in a single pair of contrasting character is called-----cross
a) monohybrid b) dihybrid c) trihybrid d) tetrahybrid
3. Complete linkage is observed in-----
a) Maize b) Sorghum c) Male drosophila d) Female drosophila
4. Crossing over occurs during-----
a) Diplotene b) Pachytene c) Diakinesis d) Monokinesis
5. The sister chromatids separate at-----
a) Prophase b) Metaphase c) Telophase d) Anaphase
6. The polytene chromosomes were discovered for the first time in
a) Drosophila b) Musca domestica c) Chironomus d) Musca nebula.
7. Homozygous dominant gene for a type of cone give brown colour. The formation of cones with white expresses -----
a) Penetrance b) Expressivity c) Genotype d) phenotype
8. If gene expresses itself then its penetrance is-----
a) 0.5 b) 1 c) 1.5 d) 2
9. For homozygotes, expected genotype frequencies are-----
a) q^2 b) p^2 c) pq d) $2pq$
10. Which of the following would cause deviation from the Hardy-Weinberg equilibrium -----
a) small population b) isolated c) Random mating d) large population

Part B

5 X 6=30

Answer the following

Answer should not exceed 400 words or two pages

- 11.a. How is a test cross performed? Explain with an example?
(or)
- 11.b. Add an account on sex limited genes and sex influenced male dominance genes?
- 12.a. Substantiate the occurrence of genetic linkage?
(or)
- 12.b. Brief on the mechanisms of dosage compensation?
- 13.a. Discuss on the structure of eukaryotic chromosome?
(or)
- 13.b. Explain about the banding patterns of chromosomes?
- 14.a. Differentiate penetrance and expressivity?
(or)
- 14.b. Explain the role of pleiotrophy in expression of traits with an example?
- 15.a. How is allele frequency calculated?
(or)
- 15.b. Add a note on gene pool?

Part C

5 x 12=60

Answer the following

Answer should not exceed 800 words or four pages

- 16.a. Add a note on multiple allele with suitable examples? Explain its characteristics?
(or)
- 16.b. Explain about mendelian principles and laws of heredity?
- 17.a. Describe about transformation and conjugation process of bacterial genetic recombination?
(or)
- 17.b. Discuss on (i) Crossing over (ii) linkage analysis?
- 18.a. What are the various types of structural variations that occur in chromosomes?
(or)
- 18.b. Explain about the types of Non - dysjunction?
- 19.a. Explain polygenic inheritance in humans with suitable examples?
(or)
- 19.b. What is complementation test? How is it used in gene identification?
- 20.a. Give the principles and applications of Hardy Weinberg equilibrium?
(or)
- 20.b. Explain about the genetic control of development in *Drosophila melanogaster*?