

**B.Sc. ZOOLOGY**  
**FIFTH SEMESTER**  
**PRINCIPLES OF GENETICS**  
**BSZ-502**  
[USE OMR FOR OBJECTIVE PART]

**SET**  
**A**

Duration: 3 hrs.

Full Marks: 70

Time: 30 mins.

( Objective )

Marks: 20

*Choose the correct answer from the following:*

*1×20=20*

- Which of the following characteristics of pea plants was not used by Mendel in his experiments?
  - Seed colour
  - Seed shape
  - Pod length
  - Flower position
- Test cross determines:
  - Whether two traits are linked or not
  - The genotype of F<sub>2</sub> plant
  - Whether the two species will breed successfully or not
  - Number of alleles in a gene
- Which of the following role is performed by a bacteriophage in transduction?
  - Donor
  - Vector
  - Recipient
  - Episome
- What are the plasmid status of bacterial cells resulting from conjugation between a F<sup>+</sup> and F<sup>-</sup> bacteria?
  - Two F<sup>+</sup> bacteria
  - Both F<sup>-</sup>
  - Two F<sup>-</sup> bacteria
  - No change
- What, according to Mendel, was responsible for the inheritance of specific traits?
  - Genes
  - Factors
  - Chromosomes
  - DNA
- What technique in plant biology was used by Gregor Mendel to derive the patterns of inheritance?
  - Hybridization
  - Mutagenesis
  - Exportation
  - Importation
- All of these follow Mendel's law, except:
  - Independent assortment
  - Dominance
  - Purity of gametes
  - Linkage
- The percentage of crossover between two genes is higher when:
  - The genes are in a distinct cell
  - There is no relationship between genes
  - Connected genes are near to one another
  - Related genes are separated by a large distance
- The SRY gene is unique to the:
  - X chromosome
  - Y chromosome
  - Both
  - None

10. Which of this mechanism of sex determination is found in birds?
  - a. XX Female-XO Male
  - b. XO Female-XX Male
  - c. ZW Female-ZZ Male
  - d. ZZ Female-ZW Male
11. Barr bodies are found in the:
  - a. Cytoplasm of female
  - b. Nuclei of female
  - c. Cytoplasm of male
  - d. Nuclei of male
12. Statement A: The karyotype of Klinefelter syndrome is 47XXY.  
Statement B: The extra chromosome is inherited genetically.
  - a. Statement A is correct but statement B is incorrect
  - b. Statement A is incorrect but statement B is correct
  - c. Both statements A and B are correct
  - d. Both statements A and B are incorrect
13. Addition or deletion of bases causes which kind of mutation?
  - a. Transversion
  - b. Transition
  - c. Frameshift mutation
  - d. Transcription
14. A condition in which the organisms have more than two complete sets of chromosomes is called:
  - a. Polyploidy
  - b. Euploidy
  - c. Aneuploidy
  - d. None of the above
15. Kappa particles indicate:
  - a. Nuclear inheritance
  - b. Cytoplasmic inheritance
  - c. Mutation
  - d. None of the above
16. What do you call genes that "jump" from one chromosome to another?
  - a. Transposons
  - b. Jumping genes
  - c. Transposable elements
  - d. All of the above
17. Left handed DNA is known as:
  - a. B-DNA
  - b. Z- DNA
  - c. Both
  - d. None of the above
18. A nucleoside is:
  - a. Base + Sugar
  - b. Base + Phosphate
  - c. Sugar + Phosphate
  - d. Base + Sugar + Phosphate
19. Mutation which do not cause any functional change in the protein are known as:
  - a. Non-sense mutation
  - b. Mis-sense mutation
  - c. Backward mutation
  - d. Silent mutation
20. Which of the following is not ionizing radiation?
  - a. X rays
  - b. UV rays
  - c. Cosmic rays
  - d. Alpha rays

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**( Descriptive )**

Time : 2 hr. 30 mins.

Marks : 50

[ Answer question no.1 & any four (4) from the rest ]

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|--|----------|
| 1. What is mutation? Explain different types of gene mutation and significance of mutation.  | 2+6+2=10 |
| 2. What are the different mechanisms of sex determination? Explain the various classes of chromosomal sex determination with necessary illustrations and examples. | 4+6=10   |
| 3. Write down the characteristics of multiple alleles. Describe the role of multiple alleles in the inheritance of ABO blood group and Rh factor in humans.        | 3+7=10   |
| 4. What are the causes and symptoms of genetic disorder? Explain the different types of structural chromosomal abnormalities.                                      | 5+5=10   |
| 5. Why did Mendel choose Pea plant as his experimental material? Explain the law of segregation by taking the example of inheritance of seed shape in Pea.         | 2+8=10   |
| 6. Explain Bacterial conjugation with suitable diagram.  | 8+2=10   |
| 7. Describe extra chromosomal inheritance with a suitable example.   | 10       |
| 8. Write short note on:  | 5+5=10   |
| a) Transposable genetic material   |          |
| b) RNA   |          |

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