

**PARUL UNIVERSITY**  
**COLLEGE OF AGRICULTURE**  
**B.Sc. (Hons.), Winter 2016 - 17 Examination**

**Semester: 1**  
**Subject Code: 20102101**  
**Subject Name: Principles of Genetics**

**Date: 26/12/2016**  
**Time: 2:00 pm to 5:00 pm**  
**Total Marks: 60**

**Instructions**

1. Attempt all questions from each section.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Write section – A, section – B on separate answer sheets.

**SECTION - A**

**Q.1 Fill in the blanks. (Each of 0.50 marks) (10)**

1. Mitosis does not occurred in \_\_\_\_\_ cells.
2. \_\_\_\_\_ is the title of the Mendel's experiment.
3. \_\_\_\_\_ is required for the replication and stability of the chromosome.
4. CEN DNA is about \_\_\_\_\_ base pair long.
5. \_\_\_\_\_ and \_\_\_\_\_ are basic amino acids.
6. Chromosome is not visible in active nucleus due to their \_\_\_\_\_.
7. The product of a mutation is called as \_\_\_\_\_.
8. The process of DNA synthesis from RNA is called as \_\_\_\_\_.
9. \_\_\_\_\_ refers to closely linked and functionally related gene.
10. Characters which are governed by several genes are called as \_\_\_\_\_.
11. Dominance variance results due to \_\_\_\_\_.
12. Cytoplasmic DNA is usually \_\_\_\_\_.
13. Sex chromosomes are also known as \_\_\_\_\_.
14. Sex linkage was first discovered by \_\_\_\_\_ in *Drosophila*.
15. Combine study of cytology and genetics is known as \_\_\_\_\_.
16. DNA replication taken place during \_\_\_\_\_ phase.
17. Translocation involves \_\_\_\_\_ chromosome.
18. \_\_\_\_\_ is the major genetic constituent of chromosome.
19. Segregation and recombination do not taken place during \_\_\_\_\_.
20. A spherical body found within a nucleus is called as \_\_\_\_\_.

**Q.2 Match group A with group B. (Each of 0.50 marks) (05)**

- | A                     | B                           |
|-----------------------|-----------------------------|
| 1) Chloroplast        | a) ABO blood group in man   |
| 2) DNA synthesis      | b) Chromosomes              |
| 3) Acrocentric        | c) Duplication              |
| 4) Strasburger (1875) | d) Photosynthesis           |
| 5) Segregation        | e) Low of purity of gametes |
| 6) Ribosome           | f) Interphage               |
| 7) C. B. Bridge       | g) Protein synthesis        |
| 8) $2n+1+1$           | h) Sub-terminal             |
| 9) Garden pea         | i) Double trisomic          |
| 10) Johannsen         | j) Mendel                   |

**Q.3 Define the following. (Any ten) (05)**

1. Cell
2. Heredity
3. Cytology
4. Ribosome
5. Cell division
6. Telomere
7. Matrix
8. Euchromatin
9. Haploids
10. Gene Interaction
11. Chiasma
12. Cytoplasmic DNA

**Q.4 Answer the following. (Any ten) (10)**

1. Enlist the types of variation.
2. Explain briefly how environment is useful in sex determination with one example.
3. What are the significance of crossing over?

4. Enlist the different types of linkage.
5. Enlist different types of epistasis.
6. Enlist various types of haploids.
7. Describe briefly main feature of linkage.
8. Give the brief classification of chromosome based on position of centromere.
9. Give a brief account of various stage of meiosis.
10. Explain briefly the significance of mitosis.
11. Describe in brief function of nucleus.
12. Describe briefly reasons of Mendel's success in investigation the law of heredity.

### SECTION - B

#### Q.1 Multiple choice type questions. (Each of 0.50 mark)

(10)

1. Theory of Epigenesis was proposed by
 

A) August Weismann	C) Wolff
B) De Vries	D) Lamarck
2. Stroma and grana are the parts of
 

A) Chloroplast	C) Mitochondria
B) Nucleus	D) Lysosomes
3. The term lysosome was first used by
 

A) Porter (1948)	C) Duve (1955)
B) Camillo (1822)	D) Benda (1897)
4. Segregation occurs during
 

A) Mitosis	C) Meiosis
B) Endo-mitosis	D) All of the above
5. In mitosis, chromatids move to opposite pole during.
 

A) Prophase	C) Anaphase
B) Metaphase	D) Telophase
6. The term chromosome was coined by.
 

A) Strasburger (1875)	C) Darlington (1937)
B) Waldeyer (1888)	D) Balbiani (1881)
7. Puffs are the sites of
 

A) Protein	C) RNA synthesis
B) DNA synthesis	D) All of the above
8. Loops are found in.
 

A) Polytene chromosomes	C) Lampbrush chromosomes
B) Isochromosomes	D) All of the above.
9. Duplication was first reported by.
 

A) C.B. Bridges (1919)	C) T.H. Morgan (1910)
B) Sturtevant (1926)	D) None of the above.
10. Laws of inheritance were discovered by Mendel in 1866 working with
 

A) Drosophila	C) Garden pea
B) Maize	D) Neurospora
11. Mendel's result were published in 1866 in the
 

A) Journal of heredity	C) Proceeding of Natural History of Brunn
B) Journal of genetics	D) All of above
12. Sex chromosome was first discovered by
 

A) M c lung (1902)	C) C.B. bridges (1922)
B) Wilson and Stevens (1905)	D) T.H. Morgan (1933)
13. The term polygenes was first used by
 

A) R. A. Fisher (1918)	C) Sewall Wright (1935)
B) K. Mather (1941)	D) D. S. Falconer (1960)
14. The term nucleic acid was first used by
 

A) Miescher (1871)	C) Altman (1889)
B) Mendel (1866)	D) Watson and crick (1953)
15. DNA as the genetic material was first discovered by
 

A) Griffith (1928)	C) Avery, Macleod and Mc Carty (1944)
B) Hershey and chase (1951)	D) Benzer (1955)

16. RNA acts as a genetic material in  
 A) Tobacco mosaic virus  
 B) E. coli  
 C) Neurospora  
 D) None of the above
17. The process of DNA synthesis from RNA is called  
 A) Reverse translation  
 B) Transcription  
 C) Reverse transcription  
 D) Reverse mutation
18. Mutation was first discovered by  
 A) Wright (1901)  
 B) Muller (1927)  
 C) De Vries (1900)  
 D) Stadler (1928)
19. The journal of genetics was founded by  
 A) R. A. Fisher (1918)  
 B) Mendel (1866)  
 C) Bateson and Punnett(1901)  
 D) Morgan(1910)
20. The term endoplasmic reticulum was first used by  
 A) Benda (1897)  
 B) Porter (1948)  
 C) Dave (1955)  
 D) Talbert (1968)

**Q.2 Give the sentence true or false. (Each of 0.50 mark)**

**(05)**

1. Mendel's results were rediscovered by Bateson and Punnet.
2. Nucleolus is found in the cytoplasm.
3. Stroma and grana are the parts of mitochondria.
4. Lysosomes originated from Golgi body.
5. The puffs are also known as Balbiani ring.
6. Duplication originated due to unequal crossing over.
7. Dominant characters are suppressed in F<sub>1</sub>.
8. Genotypic classes are always higher than phenotypic classes.
9. Crossing over leads to separation of linked gene.
10. Cytoplasmic inheritance exhibits maternal effect.

**Q.3 Write short notes. (Any five)**

**(10)**

1. Chromosome
2. Translocation
3. Polygenic traits
4. Mitosis
5. Karyotype
6. Lampbrush chromosome

**Q.4 Differentiate the following. (Any five)**

**(05)**

1. Mitosis and Meiosis
2. Plant cell and animal cell
3. DNA and RNA
4. Prokaryotes and Eukaryote
5. Crossing over and Linkage
6. Autosomes and Allosomes
7. Heterochromatin and Euchromatin