

GOVERNMENT ZIRTIRI RESIDENTIAL SCIENCE COLLEGE

Subject: **Zoology**

Paper name: **Molecular Biology & Genetics**

Paper No: **IX**

Semester: **Sixth**

A. Multiple choice questions:

1. The distance between two nucleotides in double helix DNA is
 - a) 34 Å
 - b) 3.4 Å
 - c) 20 Å
 - d) 10 Å
2. DNA strands are called “anti-parallel” because of
 - a) hydrogen bond
 - b) phosphodiester bonds
 - c) disulphide bonds
 - d) glycosidic bonds
3. The loops of Lampbrush chromosomes are rich in
 - a) tRNA and DNA
 - b) mRNA
 - c) rRNA and proteins
 - d) DNA and proteins
4. A nucleosome is made up of
 - a) DNA
 - b) histone
 - c) histone wrapped over octameric core of nucleic acid
 - d) DNA wrapped over octameric core of histone
5. Polytene chromosomes are formed due to repeated division of chromosomes without cytoplasmic division, called
 - a) mitosis
 - b) meiosis
 - c) endomitosis
 - d) endomeiosis
6. DNA replication occurs in
 - a) G1 phase
 - b) G2 phase
 - c) S phase
 - d) Interphase
7. Semiconservative DNA replication was first demonstrated by
 - a) Taylor

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- b) Watson and Crick
 - c) Meselson and Stahl
 - d) Khorana
8. Okazaki fragments are formed in
- a) the splicing of RNA
 - b) the synthesis of lagging strand of DNA
 - c) the neurons of vertebrates
 - d) the oocytes of amphibians
9. Which of the following is an agent that damages DNA
- a) chemicals used in chemotherapy
 - b) earthquake
 - c) lightning
 - d) None of the above
10. Breaks in the backbone of DNA may be caused due to
- a) a single strand break
 - b) breakage of hydrogen bond
 - c) a single stranded or double stranded break
 - d) None of the above
11. The amino acid that initiates translation is
- a) methionine
 - b) arginine
 - c) formylated methionine
 - d) lysin
12. The part of tRNA that takes part in interaction with the codon of mRNA is called
- a) T-loop
 - b) aminoacid attachment site
 - c) D-loop
 - d) anticodon
13. Which one of the following is stop codon?
- a) UAA
 - b) UAG
 - c) UGA
 - d) All of the above
14. Which one of the following is not a component of the lac operon model?
- a) promoter
 - b) structural gene
 - c) primer gene
 - d) regulator gene
15. The enzyme that transcribes RNA is

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- a) DNA polymerase I
 - b) DNA polymerase III
 - c) RNA polymerase
 - d) aminoacyl synthetase
16. In monohybrid cross, a typical genotype ratio is
- a) 3:1
 - b) 9:7
 - c) 9:3:3:1
 - d) 1:2:1
17. Which one of the following is called "law of purity of gametes"?
- a) law of segregation
 - b) law of dominance
 - c) law of independent assortment
 - d) All of the above
18. ABO group is an example of
- a) sex-linked inheritance
 - b) non-disjunction of chromosomes
 - c) pleiotropic genes
 - d) multiple allelism
19. Which part of the cytoplasm is responsible for cytoplasmic inheritance?
- a) egg
 - b) sperm
 - c) Both (a) and (b)
 - d) None of the above
20. Chromosome theory of inheritance has been proved by
- a) Strasburger and Fleming
 - b) Sutton and Boveri
 - c) Mendel
 - d) Hertwig and van Beneden
21. Which of the following is a sex-linked trait?
- a) haemophilia
 - b) Klienfelter syndrome
 - c) Turner syndrome
 - d) Downs syndrome
22. Downs syndrome is
- a) XO females
 - b) XXY males
 - c) Trisomy 18
 - d) Trisomy 21

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23. Strength of linkage is related inversely to distance between

- a) genes
- b) chromatids
- c) chromosomes
- d) telomeres

24. When released from the ovary, the human egg contains

- a) one Y chromosome
- b) one X chromosome
- c) two X chromosomes
- d) XY chromosomes

25. Synaptonemal complex is observed during

- a) meiotic prophase
- b) mitotic prophase
- c) meiotic metaphase
- d) mitotic telophase

B. Fill in the blanks:

1. DNA is associated with highly basic proteins called _____ .
2. The chromosomal puffs of polytene chromosomes are called _____ .
3. The diffuse form of chromatin that stains lightly is called _____.
4. DNA replication occurs in _____ direction.
5. In DNA replication, the strand which is synthesized continuously is called _____.
6. _____ repair system is responsible for removing small, non helix distorting base lesions from the genome.
7. The number of nonsense codons are _____ .
8. The 3'-OH of one nucleotide is linked to 5'-phosphate of the next by _____ bond.
9. Transcription is the transfer of genetic information from _____ to mRNA.
10. _____ refers to any of the several forms of a gene.
11. Maternal inheritance is due to genes present in _____ .
12. Genes are located on _____ .
13. _____ are chromosomes except sex chromosomes.
14. _____ syndrome is caused by non-disjunction of chromosomes.
15. The loss of one single chromosome creates a condition called _____ .

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Answer Key

A. Multiple choice questions

- | | | | | | | |
|--------|--------|--------|--------|--------|--------|--------|
| 1. b) | 2. b) | 3. c) | 4. d) | 5. c) | 6. c) | 7. c) |
| 8. b) | 9. a) | 10. c) | 11. c) | 12. d) | 13. d) | 14. c) |
| 15. c) | 16. d) | 17. a) | 18. d) | 19. a) | 20. b) | 21. a) |
| 22. d) | 23. a) | 24. c) | 25. a) | | | |

B. Fill in the blanks

1. histones
2. Balbiani rings
3. euchromatin
4. 5'-3'
5. leading strand
6. base excision
7. three
8. phosphodiester bond
9. DNA
10. allelism
11. mitochondria
12. chromosomes
13. autosomes
14. Downs
15. monosomy