

M.Sc. Second Semester- (Zoology)

Paper: Molecular Biology & Elementary Biotechnology

1. The type of coiling in DNA is

- (a) Zig-zag
- (b) Left-handed
- (c) Opposite
- (d) Right-handed

Answer: d

2. The bases are held together in a DNA double helix by hydrogen bonds. These bonds are

- (a) Ionic bonds
- (b) Covalent bonds
- (c) Non-covalent bonds
- (d) Van der Waals forces

Answer: c

3. What is the nature of the strands of the DNA duplex?

- a. Anti-parallel and complementary
- b. Identical and complementary
- c. Anti-parallel and non-complementary
- d. Dissimilar and non-complementary

Answer: a

4. The phenomenon of twisting around itself by a molecule to relieve helical stress is

- a) Supercoiling
- b) Coiling
- c) Elongation
- d) Compression

Answer: a

5. The enzyme responsible for the removal of supercoiling in replicating DNA ahead of the replication fork is

- a) Topoisomerase
- b) Primase
- c) DNA polymerase

d) Helicase

Answer: a

6. The tertiary structure of the tRNA is _____

a) Clover leaf

b) Crossbow

c) L shaped

d) Plus shaped

Answer: c

7. Which of these statements is incorrect with regards to the importance of hydrogen bonding and DNA double helix stability?

(a) specificity of base pairing

(b) favourable tautomeric form of nucleotide bases

(c) contributes to the thermodynamic stability

(d) decreases the entropy

Answer: d

8. At which end are the new DNA bases added in prokaryotic DNA replication?

a) 5' triphosphate end

b) 3' triphosphate end

c) 5' OH end

d) 3' OH end

Answer: d

9. The eukaryotic replication of DNA is

a) Bidirectional with many origins

b) Unidirectional with many origins

c) Bidirectional with single origin

d) Unidirectional with single origin

Answer: a

10. In eukaryotes, RNA II facilitates transcription of

a) rRNA

b) mRNA

c) hnRNA

d) tRNA

Answer: c

11. The primary control of gene expression takes place at the level of

- a) Translation
- b) Replication
- c) Transcription
- d) None

Answer: c

12. The gene sequence that codes for proteins are

- a) Exons
- b) Introns
- c) Intervening sequences
- d) Control regions

Answer: a

13. The codon is a _____

- a) Singlet
- b) Duplet
- c) Triplet
- d) Quadruplet

Answer: c

14. Which of the following is not a chain termination codon?

- a) UAA
- b) UGA
- c) UAG
- d) UGG

Answer: d

15. Which of the following is not a type of RNA processing?

- a) Polyadenylation at the 3' end
- b) Capping of 5' end
- c) Removal of exons
- d) Splicing

Answer: c

16. As the polymerase reaches the end of RNA which of the following event does not occur as a response?

- a) Transfer of Polyadenylation enzyme
- b) Cleavage of the RNA
- c) Addition of poly A at the 3' end
- d) Termination of transcription

Answer: c

17. What is the correct definition of excision repair?

- a) Repair of a single damaged nucleotide
- b) Repair of a damaged oligonucleotide
- c) Removal of a single damaged nucleotide
- d) Removal of a damaged oligonucleotide

Answer: c

18. Which enzyme is not produced during lactose catabolism by E. coli?

- a) β -galactosidase
- b) Lactose Permease
- c) Thiogalactoside transacetylase
- d) Lactose dehydrogenase

Answer: d

19. In lac-operon, which protein is not regulated by the repressor?

- a) Galactosidase
- b) Lactose Permease
- c) Tryptophan
- d) Transacetylase

Answer: c

20. Which is the most processive of prokaryotic DNA polymerases?

- a) pol I
- b) pol II
- c) pol III
- d) klenow fragment

Answer: c

21. Which of the following enzyme is responsible for making a DNA copy from RNA?

- a) Reverse transcriptase
- b) DNA polymerase
- c) RNA polI
- d) RNA polIII

Answer: a

22. Which of the following can be termed as a restriction modification system?

- a) Restriction endonuclease + methylase
- b) DNA ligase + methylase
- c) Restriction endonuclease + acetylase
- d) DNA ligase + acetylase

Answer: a

23. Which of the following enzymes' combined action leads to the generation of sticky ends in plasmid vector?

- a) Alkaline phosphatase and terminal transferase
- b) Exonuclease III and alkaline phosphatase
- c) Bacteriophage lambda exonuclease and terminal transferase
- d) Exonuclease III and terminal transferase

Answer: c

24. To make the recombinant plasmid permeable to DNA molecules, which of the chemicals is added?

- a) $MgCl_2$
- b) $CaCl_2$
- c) NaCl
- d) HCl

Answer: b

25. The extra chromosomal, self-replicating, closed, double stranded and circular DNA molecule is generally termed as

- a) Chromosome
- b) Plasmid
- c) Genomic DNA
- d) Bacteriophage

Answer: b

26. In DNA finger printing 'Hybridization' means

- a) Pairing between the nucleotides of DNA sample with probe
- b) Pairing between the nucleotides of DNA and mRNA
- c) Pairing between the nucleotides of probe with mRNA
- d) Pairing between the nucleosides with mRNA

Answer: a

27. Which of the following enzyme is used in PCR?

- a) Taq DNA polymerase
- b) HRP
- c) EcoRI
- d) EcoRII

Answer: a

28. In which of the following techniques, the DNA is labelled using complementary sequences and then analyzed using autoradiography?

- a) Western blotting
- b) Southern blotting
- c) Isopycnic centrifugation
- d) Spectrophotometry

Answer: b

29. Transgenic organisms are generally

- a) Extinct organisms
- b) Naturally occurring and endemic
- c) Produced by traditional plant breeding technique
- d) Produced by gene transfer technology

Answer: d

30. Which of the following molecules can be analysed using a northern blot?

- a) RNA
- b) Carbohydrates
- c) Proteins
- d) DNA

Answer: a

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