NEET : CHAPTER WISE TEST- 5

SUBJECT :- BIOLOGY **DATE.....**
CLASS :- 12th **NAME.....**
CHAPTER :- MOLECULAR BASIS OF INHERITANCE **SECTION.....**

(SECTION-A)

1. Find the incorrect match.
(A) φ × 174 phage – 5383 deoxyribose sugar in its genetic material
(B) λ - phage-2 × 48502 nucleotides
(C) E. coli-4.6 × 10^6 base pairs
(D) Human-3.3 x 10^9 nucleotides in its genome

2. Select the incorrectly matched pair.

(A) Purine nucleosides	1'-9 glycosidic linkage
(B) 3D model of B-DNA	Watson and Crick
(C) C-valve of B-DNA	Total amount of DNA in diploid cell
(D) Adenine and guanine	Nine-membered double-ring structures

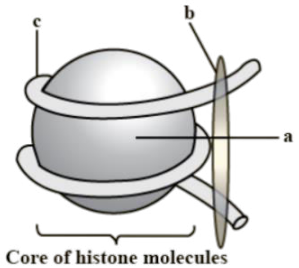
3. The force that holds DNA together in a double helix is
(A) Hydrogen bonds
(B) The force of the twist
(C) N-glycosidic linkage
(D) Ionic interactions

4. How many N-glycosidic linkage are present in φ 174 bacteriophage?
(A) 48502 (B) 5386
(C) 10772 (D) 4.6 * 10^6

5. In a DNA molecule, two polynucleotide chains are different in
(A) Number of purine and pyrimidine bases and pyrimic
(B) Polarity
(C) Molecular weight
(D) All of the above

6. What is incorrect for DNA?
(A) The pitch of the helix is 3.4 nm.
(B) Phosphate moiety is at 5' end of deoxyribose sugar,
(C) Diameter of DNA is 2 nm.
(D) The charge on the DNA is positive.

7. Refer to the given figure of nucleosome, and select the correct option:



(A) Structure (a) is H_1 protein, which is rich in arginine and aspartic acid.
(B) Structure (b) is the histone core with two molecules each of four histone proteins.
(C) Structure (c) is single-stranded DNA made up nucleotides. of 200 nucleotides
(D) Structure (b) is called Nu-Body, which has five types of histone proteins.

8. Euchromatin
(A) Is transcriptionally active
(B) Stains lightly
(C) Is loosely packed
(D) All of the above

9. The unequivocal proof that DNA is the genetic material came from the experiment of_____
(A) Miescher
(B) Alfred Hershey and Martha Chase
(C) Frederick Griffith
(D) James Watson and Francis Crick

10. RNA is not a better genetic material because
(A) It is chemically and structurally unstable
(B) It is able to generate its replica
(C) 2'-OH group present at every nucleotide in RNA as an additional moiety, which makes RNA labile and easily degradable.
(D) All except (B)

11. Select the incorrect statement.
(A) RNA was the first genetic material.
(B) Some essential life processes like metabolism, translation, and splicing evolved around DNA.
(C) DNA has evolved from RNA with chemical modification.
(D) RNA acts as genetic material as well as catalyst.

12. RNA is not genetic material in
(A) TMV
(B) QB bacteriophage
(C) HIV
(D) φ × 174

13. How many amino acids make up a protein?
(A) 10 (B) 20 (C) 30 (D) 50

14. Which of the chemical groups makes RNA labile and easily degradable?
(A) 3'-OH (B) 5'-PO_4
(C) 2'-OH (D) 3'-PO_4

15. Teminism is concerned with_____ activity.
(A) Reverse transcriptase
(B) DNA-dependent RNA polymerase
(C) RNA-dependent DNA polymerase
(D) Both (A) and (C)

16. How many phosphodiester bonds are present in the following DNA sequence?
5'ATCGATG 3' 3'TAGCTAC'
(A) 12 (B) 10 (C) 14 (D) 16

17. DNA replication is
(A) Polymerization of nucleotides by DNA-dependent DNA polymerase activity
(B) Energetically very expensive process
(C) Polymerization of ribonucleotides in 5' → 3 direction
(A) Only (A) is correct.
(B) Only (A) and (B) are correct.
(C) Only (A) and (C) are correct.
(D) (A), (B), and (C) are correct.

18. DNA replication is
(A) Semiconservative
(B) Semi-discontinuous
(C) Bidirectional
(D) All of the above

19. A failure in cell division after DNA replication results into
(A) Gene mutation
(B) Chromosomal aberration
(C) Polyploidy
(D) All except (C)

20. Read the given statements with respect to DNA replication.
A. DNA-dependent DNA polymerase catalyzes the polymerization in only one direction that is 5'→3'.
B. In eukaryotes, the replication of DNA takes place at the M phase of the cell cycle.
C. The discontinuously synthesized fragments are later joined by the enzyme ligase.
D. Deoxyribonucleoside triphosphate serves dual purpose. In addition to acting as substrates, they provide energy for polymerization reaction during DNA replication.
How many statements are correct?
(A) Two (B) One
(C) Four (D) Three

21. If a hybrid DNA molecule is allowed to replicate twice in culture medium containing N^{15}, the percentage of hybrid DNA will be
(A) 25% (B) 75%
(C) 50% (D) 17.5%

22. Isotopes used to prove semiconservative mode of DNA replication of DNA here
(A) N^{14}, C^{14} (B) S^{35}, p^{32}
(C) N^{14}, N^{15} (D) N^{14}, p^{32}

23. Discontinuously synthesized fragments of DNA are joined by
(A) RNA ligase (B) Helicase
(C) DNA polymerase II (D) DNA ligase

24. Which of the following is not the component of transcription unit?
(A) Promoter (B) Terminator
(C) Structural gene (D) Inducer

25. The functional unit of gene that specifies synthesis of one polypeptide is
(A) Muton (B) Cistron
(C) Intron (D) Transposon

26. A fully processed hnRNA is called mature RNA, which does not posses
(A) Methyl guanidine triphosphate at 5' end
(B) Tail of adenylate residue
(C) Introns
(D) More than one option is correct

27. Read the following statements with respect to transcription.
(A) There is a single RNA polymerase enzyme that catalyzes transcription of all types of RNA in prokaryotes.
(B) Termination is controlled by a factor.
(C) In eukaryotes, the polycistronic genes have interrupted coding sequences.
(D) Additional regulatory sequence may be present further upstream or downstream to the promotor.
Correct statement is/are
(A) Only (A)
(B) Only (A), and (D)
(C) Only (A) and (B)
(D) (A), (B), (C), and (D)

28. If coding strand of DNA has the nitrogenous base sequence as 5'ATGCTA3'. What would be the mRNA strand sequence?
(A) 3'AUGCUAG3' (B) 5'AUGCUAG 3'
(C) 5'UACGAUC3' (D) 3'UACGAUC5'

29. In prokaryotes, the initiation and termination factors of transcription are, respectively,
(A) σ and ρ (B) ρ and σ
(C) σ and ß (D) ρ and y

30. Post-transcriptional modification of primary transcript in eukaryotes does not involve
(A) Addition of 7-methyl guanosine triphosphate at 5" end of hnRNA
(B) Tail ring at 3' end
(C) Removal of introns and joining of exons in a coordinated manner
(D) Removal of RNA primers from hnRNA

31. The role of sigma factor in bacterial RNA polymerase is
(A) To catalyze RNA syntheses
(B) to terminate transcription process
(C) To unwind the DNA template
(D) To bind RNA polymerase enzyme correctly on the promotor region

32. If the genetic code is tetraplet, then what is the possible number of codons which code 20 amino acids?
(A) 261 (B) 64
(C) 256 (D) 43

33. UTRS in mRNA are
(A) Required for efficient translation process
(B) Present at 5' end before start codon
(C) Present at 3' end after stop codon
(D) All of the above

34. Degeneration of a genetic code is attributed to the
(A) First nucleotide of a codon
(B) Second nucleotide of a codon
(C) Third nucleotide of a codon
(D) Entire codon

35. Which of these proves the degeneracy of genetic code?
(A) Substitution
(B) Transition of nucleotides
(C) Wobble hypothesis
(D) Frameshift mutation

(SECTION-B)

36. Which of the following option is not correct with respect to soluble RNA?
(A) It has structural and catalytic roles in protein synthesis.
(B) It constitutes 15% of total cellular RNA.
(C) It possesses three unpaired nucleotides CCA at 3' end.
(D) It is soluble in 1 mole of NaCl solution.

37. The tRNA is associated with all the features except
(A) It has clover leaf 2D structure
(B) There are no tRNAs for stop codons
(C) At its 5' end, unpaired CCA sequence is present
(D) It has an anticodon loop that reaches the genetic code

38. Select the incorrectly matched pair.
(A) Soluble RNA-tRNA
(B) Shine-Dalgarno sequence-mRNA
(C) Smallest RNA-TRNA
(D) Ribozyme-23S rRNA in prokaryotes

39. Which of the following techniques is used to determine the protein structures?
(A) X-ray crystallography
(B) Kryptonics X-ray vision
(C) Magnetic resonance imaging (MRI)
(D) None of the above

40. Movement of ribosome on mRNA is called_____
(A) Translocation (B) Rotation
(C) Transfection (D) Translation

41. Which of the following is a precursor of amino acid synthesis?
(A) fatty acids
(B) α-ketoglutaric acid
(C) mineral salts
(D) volatile acids

42. Which of the following genes provides attachment site for RNA polymerase enzyme?
(A) Promoter gene (B) i gene
(C) Operator gene (D) Regulator gene

43. Which of the following is not correct with respect to lac operon?
(A) It is inducible operon system.
(B) It exactly negative control through repressor protein.
(C) Regulator gene functions all the time constitutively.
(D) The repressor proteins bind to the promoter region.

44. Read the following statements with respect to lac operon, and select the correct option.
A. It has three structural genes.
B. Glucose can act as inducer.
C. Repressor protein is acting in presence of lactose.
D. Repressor is synthesized by regulator gene.
(A) Only (B) is incorrect.
(B) (A) and (D) are correct.
(C) (A) and (D) correct.
(D) (A), (B), and (D) are correct.

45. β-Galactosidase is synthesized by E. coli to catalyze hydrolysis of_____A_____ into_____ B_____ and _____C_____
(A) A-Lactose; B-Glucose; C-Galactose
(B) A-Lactose; B-Glucose; C-Fructose
(C) A-Galactose; B-Glucose; C-Fructose
(D) A-Lactose; B-Maltose; C-Glucose

46. All the non-human genome models were sequenced at the times of Human Genome Project except
(A) Drosophila (B) Penicillium
(C) Arabidopsis (D) Caenorhabditis

47. The technique of DNA fingerprinting was initially developed by
(A) Alec Jeffreys
(B) Hargovind Das Khurana
(C) Miescher
(D) F.Crick

48. Study the following statements with respect to DNA fingerprinting.
A. The process of DNA fingerprinting involves specific sequence of DNA known as repetitive DNA.
B. VNTR belongs to a class satellite DNA referred to as microsatellite.
C. In addition to the application in forensic science, it has much wider application, such as in determining population and genetic diversities.
(A) Only (B) and (C) are correct.
(B) Only (B) is incorrect.
(C) Only (A) is correct.
(D) All are incorrect.

49. Select the most commonly used vector in the Human Genome Project.
(A) Bacteriophage
(B) Bacteriophages
(C) Plasmids only
(D) BAC and YAC

50. Phospholipids are
(A) monoglycerides
(B) diglycerides
(C) triglycerides
(D) Any of the above