EXERCISE

1. Double helix model of DNA which was proposed by watson and crick was of-
(1) C-DNA (2) B-DNA
(3) D-DNA (4) Z-DNA

2. If there are 10,000 nitrogenous base pairs in a DNA then how many nucleotides are there-
(1) 500 (2) 10,000
(3) 20,000 (4) 40,000

3. Double helix model of DNA is proposed by-
(1). Watson and Crick
(2) Schleiden schwann
(3) Singer and Nicholson
(4) Kornberg and Khurana

4. Back bone in structure of DNA molecule is made up of -
(1) Pentose Sugar and phosphate
(2) Hexose sugar and phosphate
(3) Purine and pyrimidine
(4) Sugar and phosphate

5. Nucleotide is -
(1) N_2 - base, pentose sugar and phosphoric acid
(2) Nitrogen, Hexose sugar and phosphoric acid
(3) Nitrogen base, pentose sugar
(4) Nitrogen base, trioses and phosphoric acid

6. Unit of nucleic acids are-
(1) Phosphoric acid
(2) Nitrogenous bases
(3) Pentose Sugar
(4) Nucleotides

7. Which element is not found in nitrogenous base :-
(1) Nitrogen (2) Hydrogen
(3) Carbon (4) Phosphorus

8. DNA was first discovered by-
(1) Meischer (2) Robert Brown
(3) Flemming (4) Watson & Crick

9. A N_2- base together with pentose sugar and phosphate forms (or) building - block unit of nucleic acid is :-
(1) Nucleoside (2) Polypeptide
(3) Nucleotide (4) Aminoacid

10. Which of the following is not a pyrimidine N_2 base -
(1) Thymine (2) Cytosine
(3) Guanine (4) Uracil

11. The purine & pyrimidine pairs of complementry strands of DNA are held together by –
(1) H - bonds (2) O - bonds
(3) C - bonds (4) N - bonds

12. Number of H - bonds between guanine and cytosine are -
(1) One (2) Two
(3) Three (4) Four

13. What is the nature of the 2 strands of a DNA duplex :-
(1) Identical & Complimentary
(2) Antiparallel & complimentary
(3) Dissimilar & non complimentary
(4) Antiparallel & non complimentary

14. On an average, how many purine N_2 bases are present in single coil of DNA
(1) Four (2) Five
(3) Ten (4) Uncertain

15. Distance between two nucleotide pairs of DNA is -
(1) 0.34 nm (2) 34 A^0
(3) 3.4 μ (4) 34 nm

16. In a double strand DNA amount of Guanine is 35% then what will be the amount of cytosine?
(1) 70% (2) 15%
(3) 30% (4) 35%

17. Chargaaf 's rule is given as -
(1) Purines $\neq$ Pyrimidines
(2) A + G = T+ C
(3) A+ U = G + C
(4) A + T / G + C = Const.

18. Short DNA segment has 80 thymine and 90 guanine bases. The total number of nucleotides are
(1) 160 (2) 40 (3) 80 (4) 340

19. Prokaryotic DNA is :-
(1) double stranded circular
(2) single stranded circular
(3) double stranded linear
(4) double stranded RNA as nucleic acid

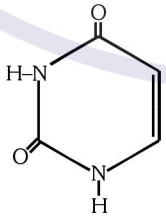
20. Nucleoside is :-
(1) Polymer of nucleic acid
(2) Phosphoric acid + base
(3) Phosphoric acid + sugar + base
(4) Sugar + base

21. If one strand of double stranded DNA, consists of the sequence 3'–ATTCGTAC–5', then the complementary sequence must be –
(1) 5'–UAAGCAUG–3'
(2) 3'–TAAGCATG–5'
(3) 5'–TAAGCATG–3'
(4) 5'–TAAGCATG–3' in the reverse direction

22. Which of the following is a false statements ?
(1) DNA is chemically less reactive, as compared to RNA
(2) RNA mutate at a faster rate, as compared to DNA
(3) Guanyl transferase enzyme helps in capping process during splicing of hn-RNA
(4) r RNA is less aboundant RNA in an animal cell

23. DNA molecule has uniform diameter due to ?
(1) Double stranded
(2) Presence of phosphate
(3) Specific base pairing between purine and pyrimidine
(4) Specific base pairing between purine and purine

24. Following structure is related to which compound?
(1) Adenine
(2) Guanine
(3) Uracil
(4) Thymine



25. If the sequence of bases in one strand of DNA is known then the sequence in other strand can be predicted on the basis of–
(1) Antiparallel (2) Complementary
(3) Polarity (4) Coiling

26. The unequivocal proof that DNA is the genetic material came from the experiments of –
(1) Hershey and chaese (1952)
(2) Frederic Griffith (1928)
(3) Watson and Crick
(4) Meselson and Stal (1958)

27. A bacterium with completely radioactive DNA was allowed to replicate in a non- radioactive medium for two generation what % of the bacteria should contain radioactive DNA :-
(1) 100 % (2) 50 % (3) 25 % (4) 12.5 %

28. In the base sequence of one strand of DNA is GAT, TAG ,CAT , GAC what shall be the sequence of its complementary strand-
(1) CAT, CTG, ATC, GTA
(2) GTA, ATC, CTG, GTA
(3) ATC, GTA, CTG, GTA
(4) CTA, ATC, GTA, CTG

29. The direction of D.N.A. replication is :
(1) From 5' end towards 3' end
(2) From 3' end towards 5' end
(3) Amino terminus to carboxy terminus
(4) Carboxy terminus to amino terminus

30. Semiconservation replication of DNA was given by
(1) Watson and Crick
(2) Bateson and Punnett
(3) Messelson and Stahl
(4) Avery, McCarty and Mactleod

31. Which of the following enzyme is used in DNA multiplication :-
(1) RNA polymerase
(2) DNA endonuclease
(3) Exonuclease
(4) DNA Polymerase

32. Mode of DNA replication in E. coli is :-
(1) Conservative and unidirectional
(2) Semi conservative and unidirectional
(3) conservative and bidirectional
(4) Semi conservative and bidrectional

33. Which of the following enzyme is used to join DNA fragments :-
(1) Terminase (2) Endonuclease
(3) Ligase (4) DNA polymerase

34. Okazaki fragments are synthesised on :-
(1) Leading strands of DNA only
(2) Lagging strands of DNA only
(3) Both leading and lagging strands of DNA
(4) Complementary DNA

35. In DNA replication, the primer is :-
(1) A small deoxyribonucleotide polymer
(2) A small ribonucleotide polymer
(3) Helix destabilizing protein
(4) Enzyme taking part in joining nucleotides of new strand

36. Replication fork is –
(1) Large opening of the DNA helix
(2) Small opening of the DNA helix
(3) Tightly coiled part of DNA helix
(4) Loosely coiled part of DNA helix

37. Code in RNA corresponding to AGCT in DNA-
(1) TACA (2) UCGA
(3) TCGA (4) AGUC

38. Which of the following is called adaptor molecule-
(1) DNA (2) m-RNA
(3) t-RNA (4) RNA

39. Which may be attached with Adenine base in RNA
(1) Guanine (2) Cytosine
(3) Uracil (4) Thymine

40. In the base sequence of one starand of DNA is CAT, TAG , CAT , CAT, GAC what would be the base sequence of its complementary m-RNA-
(1) GUA, GUA, CUG, AUC, CUG
(2) AUG, CUG, CUC, GUA, CUG
(3) GUA, AUC, GUA, GUA, CUG
(4) GUC, CUG, CUG, CUA, CUU

41. The process by which DNA of the nucleus passes genetic information to m-RNA is called-
(1) Transcription (2) Translocation
(3) Translation (4) Transportation

42. A sequence of three consecutive bases in a t- RNA molecule which specifically binds to a complementary codon sequence in m RNA is known as -
(1) Triplet (2) Non - sense codon
(3) Anti codon (4) Termination codon

43. t - RNA attach to larger subunit of ribosomes with the help of which loop -
(1) DHU - loop (2) T Ψ C loop
(3) Anticodon loop (4) Minor loop

44. In bacteria the codon AUG stands for -
(1) Glycine (2) Methionine
(3) N- formyl methionine (4) Alanine

45. In three dimensional view the molecule of t-RNA is
(1) L-shaped (2) S-shaped
(3) Y- shaped (4) E-shaped

46. During transcription, the DNA site at which RNA polymerase binds is called :-
(1) Promoter (2) Regulator
(3) Receptor (4) Enhancer

47. Which form of RNA has a structure resembling clover leaf ?
(1) rRNA (2) hnRNA
(3) mRNA (4) tRNA

48. Which one of the following makes use of RNA as a template to synthesize DNA –
(1) DNA dependant RNA polymerase
(2) DNA polymerase
(3) Reverse transcriptase
(4) RNA polymerase

49. cDNA probes are copied from the messenger RNA molecules with the help of :
(1) Restriction enzymes
(2) Reverse transcriptase
(3) DNA polymerase
(4) Adenosine deaminase

50. If the base sequence in DNA is 5' AAAA 3' then the bases sequence in m-RNA is :-
(1) 5' UUUU 3' (2) 3' UUUU 5'
(3) 5' AAAA 3' (4) 3' TTTT 5'

51. Method by which information reaches from DNA to RNA is :-
(1) Transcription (2) Translation
(3) Transformation (4) Transduction

52. Which is soluble RNA :-
(1) hnRNA (2) rRNA
(3) mRNA (4) tRNA

53. Portion of gene which is transcribed but not translated is :-
(1) exon (2) intron
(3) cistron (4) codon

54. The most abundant RNA of cell is :-
(1) r-RNA (2) t-RNA
(3) m-RNA (4) None of these

55. One strand of DNA (non template) has base sequence CAG, TCG, GAT. What will be the sequence of bases in m-RNA :-
(1) AGC, CTA, CTA
(2) GTC, AGC, CTC
(3) CAG. UCG. GAU
(4) GAC. TAG. CTA

56. Inverse transcription was discovered by :-
(1) Watson and Crick (2) Khorana
(3) Temin and Baltimore (4) Meischer

57. Mature eucaryotic m–RNA is recognised by
(1) Shine dalgarno sequence at 5′ end
(2) 7–methyl guanosine at 5′ end and polyadenine bases at 3′ end
(3) Anti shine dalgarno sequence at 5′ end
(4) Presence of coding and noncoding sequence

58. Main enzyme of transcription–
(1) DNA dependent DNA polymerase
(2) DNA dependent RNA polymerase
(3) RNA dependent RNA polymerase
(4) RNA dependent DNA polymerase

59. Removal of introns and joining of exons is called
(1) Capping (2) Tailing
(3) Splicing (4) All

60. A codon in m-RNA has :-
(1) 3-bases
(2) 2-bases
(3) 1-base
(4) Number of bases vary

61. Genetic code was deciphered by chemically synthesizing the trinucleotides by-
(1) Watson & Crick
(2) Beadle & Tatum
(3) Briggs & King
(4) M.W. Nirenberg

62. 64 Codons constitute genetic code because-
(1) There was 64 types of amino acid
(2) 64 types of t-RNA
(3) Genetic code is triplet
(4) There are 64 enzymes

63. Which codon gives signal for the start of polypeptide (protein) chain synthesis-
(1) AUG (2) UGA
(3) GUA (4) UAG

64. The function of non-sense codons is-
(1) To release polypeptide chain from t-RNA
(2) To form an unspecified amino acid
(3) To terminate the message of a gene controlled protein synthesis-
(4) To convert a sense DNA into non sense DNA

65. Termination of chain growth in protein synthesis is brought about by-
(1) UUG, UGC, UCA
(2) UCG, GCG, ACC
(3) UAA, UAG, UGA
(4) UUG, UAG, UCG

66. Sometimes the starting codon is GUG in place of AUG, GUG normally stands for:-
(1) Valine (2) Glycine
(3) Methionine (4) Tyrosine

67. Which one of the following triplet codes, is correctly matched with its specificity for an amino acid in protein synthesis or as 'start' or 'stop' codon :-
(1) UCG – Start (2) UUU – Stop
(3) UGU – Leusine (4) UAC – Tyrosine

68. Degeneration of a genetic code is attributed to the :-
(1) First member of a codon
(2) Second member of a codon
(3) Entire codon
(4) Third member of a codon

69. What would happen if in a gene encoding a polypeptide of 50 amino acids, 25th codon (UAU) is mutated to UAA :-
(1) A polypeptide of 24 amino acids will be formed
(2) Two polypeptides of 24 and 25 amino acids will be formed
(3) A polypeptide of 49 amino acids will be formed
(4) A polypeptide of 25 amino acids will be formed

70. Translation is the process in which :-
(1) D.N.A. is formed on D.N.A template
(2) R.N.A. is formed on D.N.A. template
(3) D.N.A. is formed on R.N.A. template
(4) Protein is formed from R.N.A. message

71. In a polypeptide chain of 125 amino acids, if the 25th amino acid is mutated to UAA, then :-
(1) A polypeptide of 124 amino acid is formed
(2) A polypeptide of 25 amino acid is formed
(3) A polypeptide of 24 amino acid is formed
(4) Any of the above can be possible

72. The first codon discovered by Nirenberg and Mathii was :-
(1) CCC (2) GGG
(3) UUU (4) AAA

73. Out of 64 codons only 61 codes for the 20 different amino acids.. This character of genetic code is called
(1) Degeneracy
(2) Non ambiguous nature
(3) Redundancy
(4) Overlapping

74. One-gene-one enzyme hypothesis was proposed by :-
(1) Beadle and Tatum (2) Jacob and Monod
(3) Lederberg (4) Watson and Crick

75. How many ATP and GTP molecules are required respectively for incorporation of 25 amino acids in peptide chain ?
(1) 20 ATP, 20 GTP (2) 25 ATP, 25 GTP
(3) 50 ATP, 50 GTP (4) 25 ATP 50 GTP

76. Khorana & his collegeous synthesized an RNA molecule with repeating sequences of U G N_2–bases. The RNA with "UGU GUG UGU GUG" produced a tetra peptide with alternating sequences of cystein and valine. This prove that codon for cystein & valine is
(1) UGG, GUU (2) UUG, GGU
(3) UGU & GUG (4) GUG & UGU

77. Gene which is responsible for the synthesis of a polypeptide chain is called :-
(1) Promotor gene (2) Structural gene
(3) Regulator gene (4) Operator gene

78. Which is true for repressible operon :–
(1) Off $\xrightarrow{\text{Inducer}}$ on
(2) Inactive repressor + Co-repressor = active repressor
(3) Active repressor + Inducer = inactive repressor
(4) On $\xrightarrow{\text{Inducer}}$ off

79. Which of the following is not produced by E.Coli in the lactose operon –
(1) β galactosidase
(2) Thiogalactoside transacetylase
(3) Lactose dehydrogenase
(4) Lactose permease

80. A functional complex comprising a cluster of genes including structural gene, a promoter gene, an operator gene and a regulator gene was discovered by :-
(1) Beadle and Tatum (1958)
(2) Watson and crick (1953)
(3) Jacob and Monad (1961)
(4) Britten and Davidson (1961)

81. The accessibility of promotor regions of prokaryotic DNA by RNA polymerase is in many cases regulated by the interaction of some protein with sequences termed as –
(1) Promoter (2) Operator
(3) Regulator (4) Cistron

82. Regulation of lac operon by repressor is referred to as–
(1) Positive regulation
(2) Nagative regulation
(3) Both (1) and (2)
(4) None

83. Which is incorrect
(1) i-gene codes for the repressor of lac operon
(2) z-gene codes for the beta-galactosidase
(3) y-gene codes for transacetylase
(4) three gene products are required for metabolism of lactose

84. Find out the correct sequence of structural gene in lac operon
(1) y, a, z (2) a, z, y
(3) z, y, a (4) z, a y

85. Mutation is :-
(1) An abrupt or discontinuous change which is inherited
(2) A factor for plant growth
(3) A change which affects parents only and is never inherited
(4) A change which affects the offspring of F_2 generation

86. The change of chromosomal parts between non homologous pairs of chromosome :-
(1) Crossing over/Transduction
(2) Translocation
(3) Inversion
(4) Transition

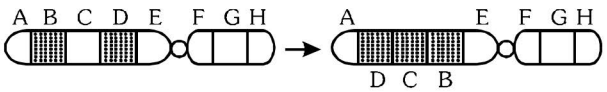
87. In the octaploid wheat, the haploid (n) and basic numbers (x) of chromosomes are :-
(1) n=21, x=7 (2) n=28, x=7
(3) n=7 x=28 (4) n=7, x=21

88. Non-ionizing radiations commonly used for inducing mutations in organisms are :-
(1) UV-rays (2) Beta-rays
(3) X-rays (4) Gamma-rays

89. Type of gene mutation which involves replacement of purine with pyrimidine or vice versa (OR) The substitution of one type of base with another type of base is :-
(1) Transduction (2) Transversion
(3) Translocation (4) Transcription

90. Sickle cell anaemia is an example of :-
(1) Frame shift mutation (2) Point mutation
(3) Segmental mutation (4) Gibberish mutation

91. Given below is the representation of a kind of chromosomal mutation :
What is the kind of mutation represented



(1) deletion (2) duplication
(3) inversion (4) reciprocal translocation

92. The "cri-du-chat" syndrome is caused by change in chromosome structure involving:-
(1) Deletion (2) Duplication
(3) Inversion (4) Translocation

93. A class of mutation induced by addition or deletion of a nucleotide is called :-
(1) Missense
(2) Non-sense
(3) Substitution
(4) frame shift

94. Chromosomes with genes **abcdefg** becoming **abedcfg** is :
(1) duplication (2) deletion
(3) translocation (4) inversion

95. Chromosome number 2n-1 is an example of
(1) trisomy (2) euploidy
(3) polyploidy (4) monosomy

96. DNA finger printing was invented by :–
(1) Kary Mullis (2) Alec Jeffery
(3) Dr. Paul Berg (4) Francis Collins

97. Which step does not involve in DNA finger printing
(1) Southern blotting
(2) Gel electrophoresis
(3) Restriction enzyme digestion
(4) Northern blotting

98. The technique of transferring DNA fragment separated on agarose gel to a synthetic membrane such as nitrocellulose is known as
(1) Northern blotting (2) Southern blotting
(3) Western blotting (4) Dot blotting

99. Which of the following techniques are used in analyzing restriction fragment length polymorphism (RFLP) :-
(a) Electrophoresis
(b) Electroporation
(c) Methylation
(d) Restriction digestion
(1) 'a' and 'c' (2) 'c' and 'd'
(3) 'a' and 'd' (4) 'b' and 'd'

100. The transfer of protein from electrophoretic gel to nitrocellulose membrane is known as :-
(1) transferase
(2) northern blotting
(3) western blotting
(4) southern blotting

101. In density gradient centrifugation , the bulk DNA forms_____ while satellite DNA forms_____.
(1) Major peak; Minor peak
(2) Minor peak; Major peak
(3) Major peak; Major peak
(4) Minor peak; Minor peak

102. Which step is not correct in DNA finger printing–
(1) Isolation of DNA
(2) Digestion of DNA by DNA ligase enzyme
(3) Separation of DNA by electophoresis
(4) Hybridisation using labelled VNTR probe

103. DNA fingerprinting method is very useful for -
(1) DNA tests for identity & relation ships
(2) Forensic studies
(3) Polymorphism
(4) All of the above

ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	**2**	**3**	**1**	**1**	**1**	**4**	**4**	**1**	**3**	**3**	**1**	**3**	**2**	**3**	**1**
Que.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans.	**4**	**2**	**4**	**1**	**4**	**3**	**4**	**3**	**3**	**2**	**1**	**2**	**4**	**1**	**1**
Que.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Ans.	**4**	**4**	**3**	**2**	**2**	**2**	**2**	**3**	**3**	**3**	**1**	**3**	**2**	**3**	**1**
Que.	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	**1**	**4**	**3**	**2**	**3**	**1**	**4**	**2**	**1**	**3**	**3**	**2**	**2**	**3**	**1**
Que.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
Ans.	**4**	**3**	**1**	**3**	**3**	**1**	**4**	**4**	**1**	**4**	**3**	**3**	**1**	**1**	**4**
Que.	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
Ans.	**3**	**2**	**2**	**3**	**3**	**2**	**2**	**3**	**3**	**1**	**2**	**2**	**1**	**2**	**2**
Que.	91	92	93	94	95	96	97	98	99	100	101	102	103		
Ans.	**3**	**1**	**4**	**4**	**4**	**2**	**4**	**2**	**3**	**3**	**1**	**2**	**4**		