EXERCISE – I (Conceptual Question) Build Up your Understanding

GENETIC MATERIAL DNA

1. Circular and double stranded DNA occurs in –
(1) Golgibody (2) Mitochondria (3) Nucleus (4) Cytoplasm

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

3. 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

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

5. 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

6. Substance common in DNA and RNA-
(1) Hexose Sugar (2) Histamine (3) Thymine (4) Phosphate groups

7. 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

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

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

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

11. Nucleic acid (DNA) is not found in-
(1) Nucleus & nucleolus (2) Peroxysome
(3) Mitochondria & plastid (4) Chloroplast & nucleosome

12. DNA is not present in-
(1) Mitochondria (2) Chloroplast (3) Bacteriophage (4) TMV

13. A nucleic acid contains thymine or methylated uracil then it should be-
(1) DNA (2) RNA
(3) Either DNA or RNA (4) RNA of bacteria

14. Prokaryotic generic system contains-
(1) DNA & histones (2) RNA & histones
(3) Either DNA or histones (4) DNA but no histones

15. 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) Amino acid

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

17. The purine & pyrimidine pairs of complementary strands of DNA are held together be-
(1) H-bonds (2) O-bonds (3) C-bonds (4) N-bonds

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

19. Whichpurine & pyrimidine bases are paired together by H - bonds in DNA-
(1) AC & GT (2) GC & AT (3) GA & TC (4) None of the above

20. A single stranded DNA is present in-
(1) TMV (2) Salmonella (3) ϕ x 174 (4) Bacteria

21. 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

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

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

24. 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%

25. 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.

26. In RNA , Nucleotides are bonded by –
(1) H-bond (2) Phospo diester bonds
(3) Ionic bonds (4) Salt linkage

27. A nucleoside differs from a nucleotide is not having-
(1) Phosphate (2) Sugar
(3) Phosphate & sugar (4) Nitrogen base

28. Wilkins X- ray diffraction showed the diameter of the DNA helix is-
(1) 10 Å (2) 20 Å (3) 30 Å (4) 40 Å

29. In the DNA of an animal percentage of Adenine is 30 then percentage of Guanine will be -
(1) 40 (2) 30 (3) 20 (4) 70

30. Similarity in DNA and RNA-
(1) Both are polymer of nucleotides (2) Both have similar pyrimidine
(3) Both have similar sugar (4) Both are genetic material

31. Length of one loop of B- DNA-
(1) 3.4 nm (2) 0.34 nm (3) 20 nm (4) 10 nm

32. If base order in one chain of DNA is "ATCGA" then how many no. of H-bond found in DNA duplex :-
(1) 20 (2) 12 (3) 10 (4) 11

33. In DNA purine nitrogen bases are :
(1) Uracil and Guanine (2) Guanine and Adenine
(3) Adenine and cytosine (4) None

34. Two free ribonucleotide units are interlinked with:
(1) Peptide bond (2) Disulphide bond (3) Hydrogen bond (4) Phosphodiester bond

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

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

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

38. The back bone of RNA is consists of which of the following sugar:-
(1) Deoxyribose (2) Ribose (3) Sucrose (4) Maltose

39. Retrovirus have genetic material:-
(1) DNA only (2) RNA only
(3) DNA or RNA only (4) None

40. In a nucleotide H_3PO_4 binds to which carbon atom of pentose sugar:-
(1) Only 1st carbon (2) Only 3rd carbon (3) Only 5st carbon (4) Both 1st and 5th carbon

41. DNA is acidic due to:-
(1) Sugar (2) Phosphoric acid (3) Purine (4) Pyrimidine

42. T.M.V. contains:-
(1) D.N.A. (2) R.N.A. + Protein (3) R.N.A. + D.N.A. (4) D.N.A. + Protein

43. R.N.A contains which of the following base, in place of Thymine of D.N.A. :-
(1) Thymine (2) Uracil (3) Adenine (4) None of these

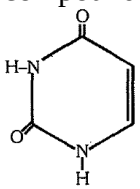
44. Genetic information are transferred from nucleus to cytoplasm of cell through :-
(1) DNA (2) RNA (3) Lysosomes (4) ACTH

45. 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

46. 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

47. 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

48. Following structure is related to which compound?



(1) Adenine (2) Guanina (3) Uracil (4) Thymine

49. 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

50. 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)

DNA REPLICATION

51. In process of replication deoxyribonucleoside triphosphate
(1) acting as substrate (2) providing energy for polymerisation reaction
(3) acting as an enzyme (4) both (1) & (2)

52. DNA duplication occurs at
(1) Meiosis- II (2) Mitotic interphase
(3) Mitosis only (4) Meiosis and mitosis both

53. DNA Replication occurs at –
(1) G_0 & G_1 (2) G_2- stage (3) S-Stage (4) Mitotic phase

54. A DNA molecule on which both strands have radioactive thymidine is allowed to duplicate in an environment containing non- radioactive thymidine. What will be the exact number of DNA molecules that contains the radio active thymidine after 3 duplications -
(1) One (2)Two (3) Four (4) Eight

55. 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 %

56. 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

57. Method of DNA replication in which two strands of DNA separates and synthesize new strands:-
(1) Dispersive (2) Conservative (3) Semiconservative (4) Non conservative

58. During replication of a bacterial chromosome DNA synthesis starts from a replication origin site and
(1) RNA primers are not involved (2) is facilitated by telomerase
(3) moves in one direction of the site (4) moves in bi-directional way

59. Which one of the following hydrolyses internal phosphodiester bonds in a polynucleotide chain-
(1) Lipase (2) Protease (3) Exonuclease (4) Endonuclease

60. The nature of DNA replication is:
(1) Conservation (2) Non conservative (3) Semi-consurvative (4) Cyanobacteria

61. 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

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

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

64. 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

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

66. 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

67. DNA replication includes :-
(1) DNA ligase (2) DNA polymerase and ligase
(3) RNA polymerase and ligase (4) All of these

68. 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

69. T he strand of DNA, which does not code for anything is referred to as :-
(1) Template strand (2) Antisense strand
(3) Coding strand (4) Noncoding strand

70. During DNA replication discontinuosly synthesized fragments are later joined by the enzyme -
(1) Ligase (2) DNA polymerage (3) RNA primer (4) Primase

71. 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

72. The DNA dependent DNA polymerase catalyse polymerisation in-
(1) 3' $\rightarrow$ 5' direction (2) 5' $\rightarrow$ 3' direction
(3) Depend on the nature of template strand (4) both (1) & (2)

73. Main enzyme of DNA replication is -
(1) DNA dependent RNA polymerase (2) DNA dependent DNA polymerase
(3) RNA dependent RNA polymerase (4) RNA dependent DNA polymerase

RNA, TRANSCRIPTION

74. The Process of copying genetic information from one strand of DNA into Y is termed as Z.

	Y	Z
(1)	Transcription	RNA
(2)	RNA	Transcription
(3)	DNA	Translation
(4)	Replication	RNA

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

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

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

78. In the base sequence of one starand of DNA is CAT, TAG, CAT, CAT, GACwhatwould 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

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

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

81. t- RNA attach to larger subunit of ribosomes with the help of which loop -
(1) DHU –loop (2) T 'I' C loop (3) Anticodon loop (4) Minor loop

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

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

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

85. During transcription, if the nucleotide sequence of the DNA strand that is being coded is ATACG, then the nucleotide sequence in the mRNA would be
(1) TATGC (2) TCTGG (3) UAUGC (4) UATGC

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

87. 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

88. 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

89. The enzyme responsible for transc;ription is:-
(1) D.N.A polymerase-1 (2) R.N.A. polymerase
(3) Reverse transcriptase (4) D.NA. polymerase-III

90. 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'

91. Correct order of molecular weight is :
(1) DNA< r-RNA < t-RNA (2) DNA < m-RNA < r-RNA
(3) t-RNA < m-RNA <~DNA (4) t-RNA < DNA < m-RNA

92. The genes are responsible for growth and differentiation in an organism through regulation of:-
(1) Translocation (2) Transformation
(3) Transduction and translation (4) Translation and transcription

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

94. DNA acts as a template for synthesis of

(1) RNA (2) DNA (3) Both '1' and '2' (4) Protein

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

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

97. The smallest RNA is :-
(1) r-RNA (2)m-RNA (3) t-RNA (4) nuclear RNA

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

99. 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. CT A

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

101. 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

102. Transcription unit in DNA is-
(1) Promoter (2) Structural gene (3) Terminator (4) All

103. In DNA promoter is the site for the initiation of
(1) Replication (2) Translation (3) Transcription (4) Both (2) & (3)

104. Main enzyme of transcription-
(1) DNA dependent DNA polymerase (2) DNA dependent RNA polymerase
(3) RNA dependent RNA polymerase (4) RNA dependent DNA polymerase

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

GENETIC CODE. TRANSLATION

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

107. A DNA strand is directly involved in the synthesis of all the following except-
(1) Another DNA (2) t-RNA & m-RNA (3) r-RNA (4) Protein

108. Genetic code was discovered by
(1) Nirenberg & Mathei (2) Kornberg & Crick
(3) Khorana & Kornberg (4) Gamow

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

110. Nirenberg synthesized an m-RNA containing 34 poly-Adenine (A-A-A-A-A-A-----) and found a polypeptide formed of 11 poly-lysine this proved that genetic code for lysine was
(1) one-adenine (2) A-A doublet (3) A-A-A triplet (4) Many adenines

111. 64 Codons constitute genetic code because
(1) There was 64 types of amino acid (2) 64 types oft-RNA
(3) Genetic code is triplet (4) There are 64 enzymes

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

113. 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

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

115. Genetic code determines-
(1) Structural pattern of an organism (2) Sequence of amino acid in protein chain
(3) Variation in offsprings (4) constancy of morphological trait

116. m- RNA is attached with -
(1) E.R. (2) Ribosome (3) Nucleus (4) Lysosome

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

118. Which one of the following triplet codes, is correctly matched with its specificity for an aminoacid in protein synthesis or as 'start' or 'stop' codon:-

(1) UCG –Start (2) UUU - Stop (3) UGU-Leusine (4) UAC-Tyrosine

119. During translation initiation in prokaryotes, a GTP molecule is needed in :-
(1) Formation of formyl-met-tRNA
(2)Binding of 30S subunit of ribosome with mRNA
(3) Association of 30 5-mRNA with formyl-met tRNA
(4) Association of 50S subunit of ribosome with initiation complex

120. 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

121. 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

122. A sequence of how many nucleotides in messenger RNA makes a codon for an amino acid?
(1) Three (2) Four (3) One (4) Two

123. A strand of DNA has following base sequence 3'-AAAAGTGACTAGTGA-5'. On transcription, it produces an m-RNA which of the following anti codon oft-RNA recognizes the third codon of this mRNA :
(1) AAA (2) CUG (3) GAC (4) CTG

124. Protein synthesis in an animal cell occurs-
(1) On ribosomes present in cytoplasm as well as in mitochondria
(2) On ribosomes present in the nucleolus as well as in cytoplasm
(3) Oniy on ribosomes attached to the nuclear envelope and endoplasmic reticulum
(4) Only on the ribosomes present in cytosol

125. Which one of the following statement is true for protein synthesis (translation) :
(1) Amino acids are directly recognized by m-RNA
(2) The third base of the codon is less specific
(3) Only one codon codes for an amino acid
(4) Everyt-RNA molerule has more than one amino acid attachment site

126. The drug streptomycin inhibits the process of:
(1) Prokaryotic translation (2) Eukaryotic translation
(3) Prokaryotic transcription (4) Eukaryotic transcription

127. 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

128. 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

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

130. Which of the following is not correct about translation:-
(1) It starts with AUG (2) Stopped at termination codon
(3) Based on operon model (4) Occurs in nucleus

131. t-RNA attaches, amino acid at its:-
(1) 3' end (2) 5' end (3) Anticodon (4) Loop

132. 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

133. Anticodons are found in :-
(1) m RNA (2) t RNA (3) r RNA (4) In all

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

135. 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

136. Which of the following RNA play structural and catalytic role during translation.
(1) m-RNA (2) t-RNA (3) r-RNA (4) All

137. Transfer of genetic information from a polymer of nucleotides to a polymer of amino acid is -
(1) Replication (2) Transcription (3) Translation (4) Reverse transcription

138. Translation refers to the process of
(1) Polymerisation of nitrogen bases (2) Polymerisation of nucleotide5
(3) Polymerisation of nucleosides (4) Polymerisation of amino acids

139. Khorana & his collegeous synthesized an RNA molecule with repeating sequences of UGN_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

GENE REGULATION

140. Gene and cistron words are sometimes used synonymously because-
(1) One cistron contains many genes (2) One gene contains many cistrons
(3) One gene contains one cistron (4) One gene contains no cistron

141. A gene containing multiple exons and at least one -intron is termed as :-
(1) split gene (2) operator gene (3) synthetic gene (4) epistatic gene

142. 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

143. Which is true for tryptophan operon:
(1) It is the example of inducible operon (2) It is example of repressible operon
(3) on $\xrightarrow{\text{co-repressor}}$ off (4) (2) and (3) both are correct

144. 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

145. What does "lac" refer to, in what we call the lac operon:-
(1) Lactose (2) Lactase (3) Lac insect (4) The number 1,00,000

146. 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

147. 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)

148. Who explained the operon model for the first time
(1) Francois Jacob (2) Jacques Monod
(3) Francois Jacob and Jacques Monod (4) Beadle & Tatum

149. 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

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

151. 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

152. Which is the primary step for regulation of gene expression.
(1) Transport of m-RNA from nucleus to the cytoplasm
(2) Translational level
(3) Processing level
(4) Transcriptional level

153. 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

154. The concept of sudden genetic change which breeds true in an organism is visualized as :-
(1) Natural selection (2) Inheritance of acquired characters
(3) Mutation (4) Independent assortment

155. 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

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

157. Which of the following can be called a mutation :
(1) The halfing of the chromosome number at meiosis
(2) The doubling of the chromosome after syngamy
(3) The possession of an additional chromosome
(4) All the above

158. Mutations are generally:
(1) Dominant (2) Recessive (3) Codominant (4) Incompeletely dominant

159. Genetic mutations occur in :-
(1) DNA (2) RNA (3) Protein (4) RNA & protein both

160. Which of the following undergoes change in mutation:-
(1) Chromosome (2) Structure of gene (3) Sequence of gene (4) Any of the above

161. The locus of mutation is :-
(1) Gene (2) Chromosome (3) Centromere (4) Nucleus

162. 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

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

164. The smallest unit of genetic material which upon mutation produce a phenotypic effect is :-
(1) Mutons (2) Recon (3) Gene (4) Cistron

165. Ultimate source of genetic variation is (OR) the process which provides raw material for evolution is:-
(1) Sexual reproduction (2) Meiosis
(3) Mutation (4) Independent assortment

166. Haploids are preferred over diploids for mutation studies because :-
(1) Recessive mutation is expressed in F_1 (2) Recessive mutation is expressed in F_2
(3) Dominant phenotype is expressed (4) Dominant phenotype is suppressed

167. 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

168. The minim1.1m requirement for mutation is :
(1) Change of triplet codon (2) Change in single nucleotide
(3) Change in whole DNA (4) Change in single strand of DNA

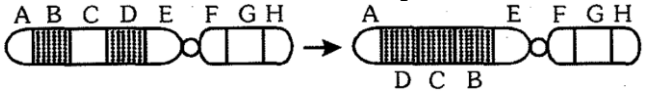
169. Mutations are:-
(1) Always useful (2) Mostly useful (3) Never useful (4) Rarely useful

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

171. The most striking example of frame shift mutation was found in a disease called :-
(1) Sickle cell anaemia (2) Colour blindness
(3) Laesh-Nyhn Syndrome (4) Thallesemia

172. A nutritionally wild type organism, which does not require any additional growth supplement is known as :-
(1) Holotype (2) Auxotroph (3) Prototroph (4) Phenotype

173. 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

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

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

177. Gene mutation is :
(1) mutation in the genes of DNA (2) mutation in the phosphodiester linkage
(3) mutation in the chromosomes (4) change in the sequence of nitrogenous bases

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

179. After a mutation at a genetic locus the character of an organism changes due to the change in
(1) protein structure (2) DNA replication
(3) protein synthesis pattern (4) RNA transcription pattern.

DNA FINGER PRINTING, HUMAN GENOME PROJECT

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

181. Which one of the following pairs of terrns/names mean one and the same thing
(1) Gene pool – genome (2) Codon - gene
(3) Cistron – triplet (4) DNA Fingerprinting - DNA profiling

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

183. 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

184. Western blotting is used for the identification of:-
(1) DNA (2) RNA (3) Protein (4) All the above

185. 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'

186. The approximate number of genes contained in the genome of Kalpana Chawla was genome of Kalpana Chawla was
(1) 40,000 (2) 30,000 (3) 80,000 (4) 1,00,000

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

188. Which of the following is not associated with HGP
(1) Bioinforrnatics (2) Cloning vectors BAC & YAC
(3) Automated DNA sequencers (4) VNTR

189. 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

190. 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 electrophoresis (4) Hybridisation using labelled VNTR probe

191. 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

EXERCISE- ()

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

92.	(4)	**93.**	(1)	**94.**	(3)	**95.**	(4)	**96.**	(2)	**97.**	(3)	**98.**	(1)
99.	(3)	**100.**	(3)	**101.**	(2)	**102.**	(4)	**103.**	(3)	**104.**	(2)	**105.**	(3)
106.	(1)	**107.**	(4)	**108.**	(1)	**109.**	(4)	**110.**	(3)	**111.**	(3)	**112.**	(1)
113.	(3)	**114.**	(3)	**115.**	(2)	**116.**	(2)	**117.**	(1)	**118.**	(4)	**119.**	(3)
120.	(4)	**121.**	(1)	**122.**	(1)	**123.**	(3)	**124.**	(1)	**125.**	(2)	**126.**	(1)
127.	(4)	**128.**	(3)	**129.**	(3)	**130.**	(4)	**131.**	(1)	**132.**	(1)	**133.**	(2)
134.	(1)	**135.**	(4)	**136.**	(3)	**137.**	(3)	**138.**	(4)	**139.**	(3)	**140.**	(3)
141.	(1)	**142.**	(2)	**143.**	(4)	**144.**	(2)	**145.**	(1)	**146.**	(3)	**147.**	(3)
148.	(3)	**149.**	(2)	**150.**	(2)	**151.**	(3)	**152.**	(4)	**153.**	(3)	**154.**	(3)
155.	(1)	**156.**	(2)	**157.**	(3)	**158.**	(2)	**159.**	(1)	**160.**	(4)	**161.**	(1)
162.	(2)	**163.**	(1)	**164.**	(1)	**165.**	(3)	**166.**	(1)	**167.**	(2)	**168.**	(2)
169.	(4)	**170.**	(2)	**171.**	(4)	**172.**	(3)	**173.**	(3)	**174.**	(1)	**175.**	(4)
176.	(4)	**177.**	(4)	**178.**	(4)	**179.**	(1)	**180.**	(2)	**181.**	(4)	**182.**	(4)
183.	(2)	**184.**	(3)	**185.**	(3)	**186.**	(2)	**187.**	(3)	**188.**	(4)	**189.**	(1)
190.	(2)	**191.**	(4)										