CHAPTER 9

NUCLEIC ACIDS

1. A nucleoside consists of

(A) Nitrogenous base
(B) Purine or pyrimidine base + sugar
(C) Purine or pyrimidine base + phosphorous
(D) Purine + pyrimidine base + sugar + phosphorous

2. A nucleotide consists of

(A) A nitrogenous base like choline
(B) Purine + pyrimidine base + sugar + phosphorous
(C) Purine or pyrimidine base + sugar
(D) Purine or pyrimidine base + phosphorous

3. A purine nucleotide is

(A) AMP (B) UMP
(C) CMP (D) TMP

4. A pyrimidine nucleotide is

(A) GMP (B) AMP
(C) CMP (D) IMP

5. Adenine is

(A) 6-Amino purine
(B) 2-Amino-6-oxypurine
(C) 2-Oxy-4-aminopyrimidine
(D) 2, 4-Dioxypyrimidine

6. 2, 4-Dioxypyrimidine is

(A) Thymine (B) Cystosine
(C) Uracil (D) Guanine

7. The chemical name of guanine is

(A) 2,4-Dioxy-5-methylpyrimidine
(B) 2-Amino-6-oxypurine
(C) 2-Oxy-4-aminopyrimidine
(D) 2, 4-Dioxypyrimidine

8. Nucleotides and nucleic acids concentration are often also expressed in terms of

(A) ng (B) mg
(C) meq (D) OD at 260 nm

9. The pyrimidine nucleotide acting as the high energy intermediate is

(A) ATP (B) UTP
(C) UDPG (D) CMP

10. The carbon of the pentose in ester linkage with the phosphate in a nucleotide structure is

(A) C_1 (B) C_3
(C) C_4 (D) C_5

11. Uracil and ribose form

(A) Uridine (B) Cytidine
(C) Guanosine (D) Adenosine

12. The most abundant free nucleotide in mammalian cells is

(A) ATP (B) NAD
(C) GTP (D) FAD

13. The mean intracellular concentration of ATP in mammalian cell is about

(A) 1 mM (B) 2 mM
(C) 0.1 mM (D) 0.2 mM

14. The nucleic acid base found in mRNA but not in DNA is

(A) Adenine (B) Cytosine
(C) Guanine (D) Uracil

15. In RNA moleule 'Caps'

(A) Allow tRNA to be processed
(B) Are unique to eukaryotic mRNA
(C) Occur at the 3′ end of tRNA
(D) Allow correct translation of prokaryotic mRNA

16. In contrast to eukaryotic mRNA, prokaryotic mRNA

(A) Can be polycistronic
(B) Is synthesized with introns
(C) Can only be monocistronic
(D) Has a poly A tail

17. The size of small stable RNA ranges from

(A) 0–40 nucleotides
(B) 40–80 nucleotides
(C) 90–300 nucleotides
(D) More than 320 nucleotides

18. The number of small stable RNAs per cell ranges from

(A) 10–50,000
(B) 50,000–1,00,000
(C) 1,00,000–10,00,000
(D) More than 10 lakhs

19. Molecular weight of heterogenous nuclear RNA (hnRNA) is

(A) More than 10^7 (B) 10^5 to 10^6
(C) 10^4 to 10^5 (D) Less than 10^4

20. In RNA molecule guanine content does not necessarily equal its cytosine content nor does its adenine content necessarily equal its uracil content since it is a

(A) Single strand molecule
(B) Double stranded molecule
(C) Double stranded helical molecule
(D) Polymer of purine and pyrimidine ribonucleotides

21. The nitrogenous base present in the RNA molecule is

(A) Thymine (B) Uracil
(C) Xanthine (D) Hypoxanthine

22. RNA does not contain

(A) Uracil (B) Adenine
(C) Thymine (D) Ribose

23. The sugar moiety present in RNA is

(A) Ribulose (B) Arabinose
(C) Ribose (D) Deoxyribose

24. In RNA molecule

(A) Guanine content equals cytosine
(B) Adenine content equals uracil
(C) Adenine content equals guanine
(D) Guanine content does not necessarily equal its cytosine content.

25. Methylated purines and pyrimidines are characteristically present in

(A) mRNA (B) hnRNA
(C) tRNA (D) rRNA

26. Thymine is present in

(A) tRNA (B) Ribosomal RNA
(C) Mammalian mRNA (D) Prokaryotic mRNA

27. The approximate number of nucleotides in tRNA molecule is

(A) 25 (B) 50
(C) 75 (D) 100

28. In every cell, the number of tRNA molecules is at least

(A) 10 (B) 20
(C) 30 (D) 40

29. The structure of tRNA appears like a

(A) Helix (B) Hair pin
(C) Clover leaf (D) Coil

30. Although each specific tRNA differs from the others in its sequence of nucleotides, all tRNA molecules contain a base paired stem that terminates in the sequence CCA at

(A) 3′ Termini (B) 5′ Termini
(C) Anticodon arm (D) 3′5′-Termini

31. Transfer RNAs are classified on the basis of the number of base pairs in

(A) Acceptor arm (B) Anticodon arm
(C) D arm (D) Extra arm

32. In tRNA molecule D arm is named for the presence of the base:

(A) Uridine (B) Pseudouridine
(C) Dihydrouridine (D) Thymidine

33. The acceptor arm in the tRNA molecule has

(A) 5 Base pairs (B) 7 Base pairs
(C) 10 Base pairs (D) 20 Base pairs

34. In tRNA molecule, the anticodon arm possesses

(A) 5 Base pairs (B) 7 Base pairs
(C) 8 Base pairs (D) 10 Base pairs

35. The TψC arm in the tRNA molecule possesses the sequence

(A) T, pseudouridine and C
(B) T, uridine and C
(C) T, dihydrouridine and C
(D) T, adenine and C

36. Double helical structure model of the DNA was proposed by

(A) Pauling and Corey
(B) Peter Mitchell
(C) Watson and Crick
(D) King and Wooten

37. DNA does not contain

(A) Thymine (B) Adenine
(C) Uracil (D) Deoxyribose

38. The sugar moiety present in DNA is

(A) Deoxyribose (B) Ribose
(C) Lyxose (D) Ribulose

39. DNA rich in A-T pairs have

(A) 1 Hydrogen bond (B) 2 Hydrogen bonds
(C) 3 Hydrogen bonds (D) 4 Hydrogen bonds

40. In DNA molecule

(A) Guanine content does not equal cytosine content
(B) Adenine content does not equal thymine content
(C) Adenine content equals uracil content
(D) Guanine content equals cytosine content

41. DNA rich in G-C pairs have

(A) 1 Hydrogen bond (B) 2 Hydrogen bonds
(C) 3 Hydrogen bonds (D) 4 Hydrogen bonds

42. The fact that DNA bears the genetic information of an organism implies that

(A) Base composition should be identical from species to species
(B) DNA base composition should charge with age
(C) DNA from different tissues in the same organism should usually have the same base composition
(D) DNA base composition is altered with nutritional state of an organism

43. The width (helical diameter) of the double helix in B-form DNA in nm is

(A) 1 (B) 2
(C) 3 (D) 4

44. The number of base pair in a single turn of B-form DNA about the axis of the molecule is

(A) 4 (B) 8
(C) 10 (D) 12

45. The distance spanned by one turn of B-form DNA is

(A) 1.0 nm (B) 2.0 nm
(C) 3.0 nm (D) 3.4 nm

46. In a DNA molecule the thymine concentration is 30%, the guanosine concentration will be

(A) 10% (B) 20%
(C) 30% (D) 40%

47. IN a DNA molecule, the guanosine content is 40%, the adenine content will be

(A) 10% (B) 20%
(C) 30% (D) 40%

48. An increased melting temperature of duplex DNA results from a high content of

(A) Adenine + Guanine
(B) Thymine + Cytosine
(C) Cytosine + Guanine
(D) Cytosine + Adenine

49. A synthetic nucleotide analogue, 4-hydroxypyrazolopyrimidine is used in the treatment of

(A) Acute nephritis
(B) Gout
(C) Cystic fibrosis of lung
(D) Multiple myeloma

50. A synthetic nucleotide analogue, used in the chemotherapy of cancer and viral infections is

(A) Arabinosyl cytosine
(B) 4-Hydroxypyrazolopyrimidine
(C) 6-Mercaptopurine
(D) 6-Thioguanine

51. Histamine is formed from histidine by the enzyme histidine decarboxylase in the presence of

(A) NAD (B) FMN
(C) HS-CoA (D) B_6-PO_4

52. Infantile convulsions due to lesser formation of gamma amino butyric acid from glutamic acid is seen in the deficiency of

(A) Glutamate-dehydrogenase
(B) Pyridoxine
(C) Folic acid
(D) Thiamin

53. Which of the following amino acids produce a vasoconstrictor on decarboxylation?

(A) Histidine (B) Tyrosine
(C) Threonine (D) Arginine

54. The degradation of RNA by pancreatic ribonuclease produces

(A) Nucleoside 2-Phosphates
(B) Nucleoside 5′-phosphates
(C) Oligonucleosides
(D) Nucleoside 3′-phosphate and oligonucleotide

55. Intestinal nucleosidases act on nucleosides and produce

(A) Purine base only (B) Phosphate only
(C) Sugar only (D) Purine or pyrimidine bases and sugars

56. In purine biosynthesis carbon atoms at 4 and 5 position and N at 7 position are contributed by

(A) Glycine (B) Glutamine
(C) Alanine (D) Threonine

57. N^{10}-formyl and N^5N^{10}-methenyl tetrahydrofolate contributes purine carbon atoms at position

(A) 4 and 6 (B) 4 and 5
(C) 5 and 6 (D) 2 and 8

58. In purine nucleus nitrogen atom at 1 position is derived from

(A) Aspartate (B) Glutamate
(C) Glycine (D) Alanine

59. The key substance in the synthesis of purine, phosphoribosyl pyrophosphate is formed by

(A) α-D-ribose 5-phosphate
(B) 5-phospho β-D-ribosylamine
(C) D-ribose
(D) Deoxyribose

60. In purine biosynthesis ring closure in the molecule formyl glycinamide ribosyl-5-phosphate requires the cofactors:

(A) ADP (B) NAD
(C) FAD (D) ATP and Mg^{++}

61. Ring closure of formimidoimidazole carboxamide ribosyl-5-phosphate yields the first purine nucleotide:

(A) AMP (B) IMP
(C) XMP (D) GMP

62. The cofactors required for synthesis of adenylosuccinate are

(A) ATP, Mg^{++} (B) ADP
(C) GTP, Mg^{++} (D) GDP

63. Conversion of inosine monophosphate to xanthine monophosphate is catalysed by

(A) IMP dehydrogenase
(B) Formyl transferase
(C) Xanthine-guanine phosphoribosyl transferase
(D) Adenine phosphoribosyl transferase

64. Phosphorylation of adenosine to AMP is catalysed by

(A) Adenosine kinase
(B) Deoxycytidine kinase
(C) Adenylosuccinase
(D) Adenylosuccinate synthetase

65. The major determinant of the overall rate of denovo purine nucleotide biosynthesis is the concentration of

(A) 5-phosphoribosyl 1-pyrophosphate
(B) 5-phospho β-D-ribosylamine
(C) Glycinamide ribosyl-5-phosphate
(D) Formylglycinamide ribosyl-5-phosphate

66. An enzyme which acts as allosteric regulator and sensitive to both phosphate concentration and to the purine nucleotides is

(A) PRPP synthetase
(B) PRPP glutamyl midotransferase
(C) HGPR Tase
(D) Formyl transferase

67. PRPP glutamyl amidotransferase, the first enzyme uniquely committed to purine synthesis is feed back inhibited by

(A) AMP (B) IMP
(C) XMP (D) CMP

68. Conversion of formylglycinamide ribosyl-5-phosphate to formyl-glycinamide ribosyl-5-phosphate is inhibited by

(A) Azaserine (B) Diazonorleucine
(C) 6-Mercaptopurine (D) Mycophenolic acid

69. In the biosynthesis of purine nucleotides the AMP feed back regulates

(A) Adenylosuccinase
(B) Adenylosuccinate synthetase
(C) IMP dehydrogenase
(D) HGPR Tase

70. 6-Mercapto purine inhibits the conversion of

(A) IMP→ XMP
(B) Ribose 5 phosphate → PRPP
(C) PRPP → 5-phospho → β -D-ribosylamine
(D) Glycinamide ribosyl 5-phosphate → formylglycinamide ribosyl-5-phosphate

71. Purine biosynthesis is inhibited by

(A) Aminopterin (B) Tetracyclin
(C) Methotrexate (D) Chloramphenicol

72. Pyrimidine and purine nucleoside biosynthesis share a common precursor:

(A) PRPP (B) Glycine
(C) Fumarate (D) Alanine

73. Pyrimidine biosynthesis begins with the formation from glutamine, ATP and CO_2, of

(A) Carbamoyl aspartate
(B) Orotate
(C) Carbamoyl phosphate
(D) Dihydroorotate

74. The two nitrogen of the pyrimidine ring are contributed by

(A) Ammonia and glycine
(B) Asparate and carbamoyl phosphate
(C) Glutamine and ammonia
(D) Aspartate and ammonia

75. A cofactor in the conversion of dihydroorotate to orotic acid, catalysed by the enzyme dihydroorotate dehydrogenase is

(A) FAD (B) FMN
(C) NAD (D) NADP

76. The first true pyrimidine ribonucleotide synthesized is

(A) UMP (B) UDP
(C) TMP (D) CTP

77. UDP and UTP are formed by phosphorylation from

(A) AMP (B) ADP
(C) ATP (D) GTP

78. Reduction of ribonucleotide diphosphates (NDPs) to their corresponding deoxy ribonucleotide diphosphates (dNDPs) involves

(A) FMN (B) FAD
(C) NAD (D) NADPH

79. Conversion of deoxyuridine monophosphate to thymidine monophosphate is catalysed by the enzyme:

(A) Ribonucleotide reductase
(B) Thymidylate synthetase
(C) CTP synthetase
(D) Orotidylic acid decarboxylase

80. d-UMP is converted to TMP by

(A) Methylation (B) Decarboxylation
(C) Reduction (D) Deamination

81. UTP is converted to CTP by

(A) Methylation (B) Isomerisation
(C) Amination (D) Reduction

82. Methotrexate blocks the synthesis of thymidine monophosphate by inhibiting the activity of the enzyme:

(A) Dihydrofolate reductase
(B) Orotate phosphoribosyl transferase
(C) Ribonucleotide reductase
(D) Dihydroorotase

83. A substrate for enzymes of pyrimidine nucleotide biosynthesis is

(A) Allopurinol (B) Tetracylin
(C) Chloramphenicol (D) Puromycin

84. An enzyme of pyrimidine nucleotide biosynthesis sensitive to allosteric regulation is

(A) Aspartate transcarbamoylase
(B) Dihydroorotase
(C) Dihydroorotate dehydrogenase
(D) Orotidylic acid decarboxylase

85 An enzyme of pyrimidine nucleotides biosynthesis regulated at the genetic level by apparently coordinate repression and derepression is

(A) Carbamoyl phosphate synthetase
(B) Dihydroorotate dehydrogenase
(C) Thymidine kinase
(D) Deoxycytidine kinase

86. The enzyme aspartate transcarbamoylase of pyrimidine biosynthesis is inhibited by

(A) ATP (B) ADP
(C) AMP (D) CTP

87. In humans end product of purine catabolism is

(A) Uric acid (B) Urea
(C) Allantoin (D) Xanthine

88. In humans purine are catabolised to uric acid due to lack of the enzyme:

(A) Urease (B) Uricase
(C) Xanthine oxidase (D) Guanase

89. In mammals other than higher primates uric acid is converted by

(A) Oxidation to allantoin
(B) Reduction to ammonia
(C) Hydrolysis to ammonia
(D) Hydrolysis to allantoin

90. The correct sequence of the reactions of catabolism of adenosine to uric acid is

(A) Adenosine→hypoxanthine→xanthine→uric acid
(B) Adenosine→xanthine→inosine→uric acid
(C) Adenosine→inosine→hypoxanthine→ xanthine uric acid
(D) Adenosine→xanthine→inosine→hypoxanthine uric acid

91. Gout is a metabolic disorder of catabolism of

(A) Pyrimidine (B) Purine
(C) Alanine (D) Phenylalanine

92. Gout is characterized by increased plasma levels of

(A) Urea (B) Uric acid
(C) Creatine (D) Creatinine

93. Lesch-Nyhan syndrome, the sex linked recessive disorder is due to the lack of the enzyme:

(A) Hypoxanthine-guanine phosphoribosyl transferse
(B) Xanthine oxidase
(C) Adenine phosphoribosyl transferase
(D) Adenosine deaminase

94. Lesch-Nyhan syndrome, the sex linked, recessive absence of HGPRTase, may lead to

(A) Compulsive self destructive behaviour with elevated levels of urate in serum
(B) Hypouricemia due to liver damage
(C) Failure to thrive and megaloblastic anemia
(D) Protein intolerance and hepatic encephalopathy

95. The major catabolic product of pyrimidines in human is

(A) β-Alanine (B) Urea
(C) Uric acid (D) Guanine

96. Orotic aciduria type I reflects the deficiency of enzymes:

(A) Orotate phosphoribosyl transferase and orotidylate decarboxylase
(B) Dihydroorotate dehydrogenase
(C) Dihydroorotase
(D) Carbamoyl phosphate synthetase

97. Orotic aciduria type II reflects the deficiency of the enzyme:

(A) Orotate phosphoribosyl transferase
(B) Orotidylate decarboxylase
(C) Dihydroorotase
(D) Dihydroorotate dehydrogenase

98. An autosomal recessive disorder, xanthinuria is due to deficiency of the enzymes:

(A) Adenosine deaminase
(B) Xanthine oxidase
(C) HGPRTase
(D) Transaminase

99. Enzymic deficiency in β-aminoisobutyric aciduria is

(A) Adenosine deaminase
(B) Xanthine oxidase
(C) Orotidylate decarboxylase
(D) Transaminase

100. Polysomes lack in

(A) DNA (B) mRNA
(C) rRNA (D) tRNA

101. Genetic information flows from

(A) DNA to DNA
(B) DNA to RNA
(C) RNA to cellular proteins
(D) DNA to cellular proteins

102. Genetic code is

(A) Collection of codon
(B) Collection of amino acids
(C) Collection of purine nucleotide
(D) Collection of pyrimidine nucleotide

103. Degeneracy of genetic code implies that

(A) Codons do not code for specific amino acid
(B) Multiple codons must decode the same amino acids
(C) No anticodon on tRNA molecule
(D) Specific codon decodes many amino acids

104. Genetic code is

(A) Overlapping (B) Non-overlapping
(C) Not universal (D) Ambiguous

105. mRNA is complementary to the nucleotide sequence of

(A) Coding strand (B) Ribosomal RNA
(C) tRNA (D) Template strand

106. In DNA replication the enzyme required in the first step is

(A) DNA directed polymerase
(B) Unwinding proteins
(C) DNA polymerase
(D) DNA ligase

107. The smallest unit of DNA capable of coding for the synthesis of a polypeptide is

(A) Operon (B) Repressor gene
(C) Cistron (D) Replicon

108. Termination of the synthesis of the RNA molecule is signaled by a sequence in the template strand of the DNA molecule, a signal that is recognized by a termination protein, the

(A) Rho (ρ) factor (B) σ factor
(C) δ factor (D) ε factor

109. After termination of the synthesis of RNA molecule, the core enzymes separate from the DNA template. The core enzymes then recognize a promoter at which the synthesis of a new RNA molecule commences, with the assistance of

(A) Rho (ρ) factor (B) δ factor
(C) β factor (D) σ factor

110. In the process of transcription in bacterial cells

(A) Initiation requires rho protein
(B) RNA polymerase incorporates methylated bases in correct sequence
(C) Both the sigma unit and core enzymes of RNA polymerase are required for accurate promotor site binding
(D) Primase is necessary for initiation

111. The correct statement concerning RNA and DNA polymerases is

(A) RNA polymerase use nucleoside diphosphates
(B) RNA polymerase require primers and add bases at 5′ end of the growing polynucleotide chain
(C) DNA polymerases can add nucleotides at both ends of the chain
(D) All RNA and DNA polymerases can add nucleotides only at the 3′ end of the growing polynucleotide chain

112. The eukaryotic nuclear chromosomal DNA

(A) Is a linear and unbranched molecule
(B) Is not associated with a specific membranous organelle
(C) Is not replicated semiconservatively
(D) Is about of the same size as each prokaryotic chromoses

113. The function of a repressor protein in an operon system is to prevent synthesis by binding to

(A) The ribosome
(B) A specific region of the operon preventing transcription of structural genes
(C) The RNA polymerase
(D) A specific region of the mRNA preventing translation to protein

114. All pribnow boxes are variants of the sequence:

(A) 5′–TATAAT –3′ (B) 5′–GAGCCA –3′
(C) 5′–UAACAA –3′ (D) 5′–TCCTAG –3′

115. 5′-Terminus of mRNA molecule is capped with

(A) Guanosine triphosphate
(B) 7-Methylguanosine triphophate
(C) Adenosine triphosphate
(D) Adenosine diphosphate

116. The first codon to be translated on mRNA is

(A) AUG (B) GGU
(C) GGA (D) AAA

117. AUG, the only identified codon for methionine is important as

(A) A releasing factor for peptide chains
(B) A chain terminating codon
(C) Recognition site on tRNA
(D) A chain initiating codon

118. In biosynthesis of proteins the chain terminating codons are

(A) UAA, UAG and UGA
(B) UGG, UGU and AGU
(C) AAU, AAG and GAU
(D) GCG, GCA and GCU

119. The formation of initiation complex during protein synthesis requires a factor:

(A) IF-III (B) EF-I
(C) EF-II (D) IF-I

120. The amino terminal of all polypeptide chain at the time of synthesis in E. coli is tagged to the amino acid residue:

(A) Methionine (B) Serine
(C) N-formyl methinine (D) N-formal serine

121. Initiation of protein synthesis begins with binding of

(A) 40 S ribosomal unit on mRNA
(B) 60 S ribosomal unit
(C) Charging of tRNA with specific amino acid
(D) Attachment of aminoacyl tRNA on mRNA

122. Initiation of protein synthesis requires

(A) ATP (B) AMP
(C) GDP (D) GTP

123. The enzyme amino acyl tRNA synthetase is involved in

(A) Dissociation of discharged tRNA from 80S ribosome
(B) Charging of tRNA with specific amino acids
(C) Termination of protein synthesis
(D) Nucleophilic attack on esterified carboxyl group of peptidyl tRNA

124. In the process of activation of amino acids for protein synthesis, the number of high energy phosphate bond equivalent utilised is

(A) 0 (B) 1
(C) 2 (D) 4

125 Translation results in a product known as

(A) Protein (B) tRNA
(C) mRNA (D) rRNA

126. In the process of elongation of chain binding of amino acyl tRNA to the A site requires

(A) A proper codon recognition
(B) GTP
(C) EF-II
(D) GDP

127. The newly entering amino acyl tRNA into A site requires

(A) EF-II (B) Ribosomal RNA
(C) mRNA (D) EF-I

128. The α-amino group of the new amino acyl tRNA in the A site carries out a nucleophilic attack on the esterified carboxyl group of the peptidyl tRNA occupying the P site. This reaction is catalysed by

(A) DNA polymerase
(B) RNA polymerase
(C) Peptidyl transferase
(D) DNA ligase

129. The nucleophilic attack on the esterified carboxyl group of the peptidyl-tRNA occupying the P site and the α-amino group of the new amino acyl tRNA, the number of ATP required by the amino acid on the charged tRNA is

(A) Zero (B) One
(C) Two (D) Four

130. Translocation of the newly formed peptidyl tRNA at the A site into the empty P site involves

(A) EF-II, GTP
(B) EF-I, GTP
(C) EF-I, GDP
(D) Peptidyl transferase, GTP

131. In eukaryotic cells

(A) Formylated tRNA is important for initiation of translation
(B) Cyclohexamide blocks elongation during translation
(C) Cytosolic ribosomes are smaller than those found in prokaryotes
(D) Erythromycin inhibits elongation during translation

132. The mushroom poison amanitin is an inhibitor of

(A) Protein synthesis (B) mRNA synthesis
(C) DNA synthesis (D) Adenosine synthesis

133. Tetracylin prevents synthesis of polypeptide by

(A) Blocking mRNA formation from DNA
(B) Releasing peptides from mRNA-tRNA complex
(C) Competing with mRNA for ribosomal binding sites
(D) Preventing binding of aminoacyl tRNA

134. In prokaryotes, chloramphenicol

(A) Causes premature release of the polypeptide chain
(B) Causes misreading of the mRNA
(C) Depolymerises DNA
(D) Inhibits peptidyl transferase activity

135 Streptomycin prevents synthesis of polypeptide by

(A) Inhibiting initiation process
(B) Releasing premature polypeptide
(C) Inhibiting peptidyl transferase activity
(D) Inhibiting translocation

136. Erythromycin acts on ribosomes and inhibit

(A) Formation of initiation complex
(B) Binding of aminoacyl tRNA
(C) Peptidyl transferase activity
(D) Translocation

137. The binding of prokaryotic DNA dependent RNA polymerase to promoter sites of genes is inhibited by the antibiotic:

(A) Puromycin (B) Rifamycin
(C) Terramycin (D) Streptomycin

138. The gene which is transcribed during repression is

(A) Structural (B) Regulator
(C) Promoter (D) Operator

139 The gene of lac operon which has constitutive expression is

(A) i (B) c
(C) z (D) p

140. The minimum effective size of an operator for lac repressor binding is

(A) 5 base pairs (B) 10 base pairs
(C) 15 base pairs (D) 17 base pairs

141 To commence structural gene transcription the region which should be free on lac operation is

(A) Promoter site (B) Operator locus
(C) Y gene (D) A gene

142. In the lac operon concept, a protein molecule is

(A) Operator (B) Inducer
(C) Promoter (D) Repressor

143. The catabolite repression is mediated by a catabolite gene activator protein (CAP) in conjunction with

(A) AMP (B) GMP
(C) cAMP (D) Cgmp

144. The enzyme DNA ligase

(A) Introduces superhelical twists
(B) Connects the end of two DNA chains
(C) Unwinds the double helix
(D) Synthesises RNA primers

145. Restriction endonucleases

(A) Cut RNA chains at specific locations
(B) Excise introns from hnRNA
(C) Remove Okazaki fragments
(D) Act as defensive enzymes to protect the host bacterial DNA from DNA of foreign organisms

146. The most likely lethal mutation is

(A) Substitution of adenine for cytosine
(B) Insertion of one nucleotide
(C) Deletion of three nucleotides
(D) Substitution of cytosine for guanine

147. In the following partial sequence of mRNA, a mutation of the template DNA results in a change in codon 91 to UAA. The type of mutation is

88	89	90	91	92	93	94
GUC	GAC	CAG	UAG	GGC	UAA	CCG

(A) Missene (B) Silent
(C) Nonsense (D) Frame shit

148. Restriction endonucleases recognize and cut a certain sequence of

(A) Single stranded DNA
(B) Double stranded DNA
(C) RNA
(D) Protein

149. Positive control of induction is best described as a control system in which an operon functions

(A) Unless it is switched off by a derepressed repressor protein
(B) Only after a repressor protein is inactivated by an inducer
(C) Only after an inducer protein, which can be inactivated by a corepressor, switches it on
(D) Only after an inducer protein, which is activated by an inducer, switch it on

150. Interferon

(A) Is virus specific
(B) Is a bacterial product
(C) Is a synthetic antiviral agent
(D) Requires expression of cellular genes

151. Repressor binds to DNA sequence and regulate the transcription. This sequence is called

(A) Attenuator (B) Terminator
(C) Anti terminator (D) Operator

152. Okazaki fragment is related to

(A) DNA synthesis (B) Protein synthesis
(C) mRNA formation (D) tRNA formation

153. The region of DNA known as TATA BOX is the site for binding of

(A) DNA polymerase
(B) DNA topoisomerase
(C) DNA dependent RNA polymerase
(D) Polynucleotide phosphorylase

154. Reverse transcriptase is capable of synthesising

(A) RNA → DNA (B) DNA → RNA
(C) RNA → RNA (D) DNA → DNA

155. A tetrovirus is

(A) Polio virus (B) HIV
(C) Herpes virus (D) Tobacco mosaic virus

156. Peptidyl transferase activity is located in

(A) Elongation factor
(B) A charged tRNA molecule
(C) Ribosomal protein
(D) A soluble cytosolic protein

157. Ultraviolet light can damage a DNA strand causing

(A) Two adjacent purine residue to form a covalently bounded dimer
(B) Two adjacent pyrimidine residues to form covalently bonded dimer
(C) Disruption of phosphodiesterase linkage
(D) Disruption of non-covalent linkage

158. Defective enzyme in Hurler's syndrome is

(A) α-L-diuronidase
(B) Iduronate sulphatase
(C) Arylsulphatase B
(D) C-acetyl transferase

159. Presence of arginine can be detected by

(A) Sakaguchi reaction
(B) Million-Nasse reaction
(C) Hopkins-Cole reaction
(D) Gas chromatography

160. A nitrogenous base that does not occur in mRNA is

(A) Cytosine (B) Thymine
(C) Uracil (D) All of these

161. In nucleotides, phosphate is attached to sugar by

(A) Salt bond (B) Hydrogen bond
(C) Ester bond (D) Glycosidic bond

162. Cyclic AMP can be formed from

(A) AMP (B) ADP
(C) ATP (D) All of these

163. A substituted pyrimidine base of pharmacological value is

(A) 5-Iododeoxyuridine
(B) Cytisine arabinoside
(C) 5-Fluorouracil
(D) All of these

164 The 'transforming factor' discovered by Avery, McLeod and McCarty was later found to be

(A) mRNA (B) tRNA
(C) DNA (D) None of these

165. In DNA, the complementary base of adenine is

(A) Guanine (B) Cytosine
(C) Uracil (D) Thymine

166. In DNA, three hydrogen bonds are formed between

(A) Adenine and guanine
(B) Adenine and thymine
(C) Guanine and cytosine
(D) Thymine and cytosine

167. Left handed double helix is present in

(A) Z-DNA (B) A-DNA
(C) B-DNA (D) None of these

168. Nuclear DNA is present in combination with

(A) Histones (B) Non-histones
(C) Both (A) and (B) (D) None of these

169. Number of guanine and cytosine residues is equal in

(A) mRNA (B) tRNA
(C) DNA (D) None of these

170. Alkalis cannot hydrolyse

(A) mRNA (B) tRNA
(C) rRNA (D) DNA

171. Codons are present in

(A) Template strand of DNA
(B) mRNA
(C) tRNA
(D) rRNA

172. Amino acid is attached to tRNA at

(A) 5′-End (B) 3′-End
(C) Anticodon (D) DHU loop

173. In prokaryotes, the ribosomal subunits are

(A) 30 S and 40 S (B) 40 S and 50 S
(C) 30 S and 50 S (D) 40 S and 60 S

174. Ribozymes are

(A) Enzymes present in ribosomes
(B) Enzymes which combine the ribosomal subunits
(C) Enzymes which dissociate
(D) Enzymes made up of RNA

175. The smallest RNA among the following is

(A) rRNA (B) hnRNA
(C) mRNA (D) tRNA

176. The number of adenine and thymine bases is equal in

(A) DNA (B) mRNA
(C) tRNA (D) rRNA

177. The number of hydrogen bonds between adenine and thymine in DNA is

(A) One (B) Two
(C) Three (D) Four

178. The complementary base of adenine in RNA is

(A) Thymine (B) Cystosine
(C) Guanine (D) Uracil

179. Extranuclear DNA is present in

(A) Ribosomes
(B) Endoplasmic reticulum
(C) Lysosomes
(D) Mitochondria

180. Mitochondrial DNA is present in

(A) Bacteria (B) Viruses
(C) Eukaryotes (D) All of these

181. Ribothymidine is present in

(A) DNA (B) tRNA
(C) rRNA (D) hnRNA

182. Ten base pairs are present in one turn of the helix in

(A) A-DNA (B) B-DNA
(C) C-DNA (D) Z-DNA

183. Transfer RNA transfers

(A) Information from DNA to ribosomes
(B) Information from mRNA to cytosol
(C) Amino acids from cytosol to ribosomes
(D) Proteins from ribosomes to cytosol

184. Ceramidase is deficient in

(A) Fabry's disease (B) Farber's disease
(C) Krabbe's disease (D) Tay-Sachs disease

185. Ceramide is present in all of the following except

(A) Plasmalogens (B) Cerebrosides
(C) Sulphatides (D) Sphingomyelin

186. Nucleotides required for the synthesis of nucleic acids can be obtained from

(A) Dietary nucleic acids and nucleotides
(B) De novo synthesis
(C) Salvage of pre-existing bases and nucleosides
(D) De novo synthesis and salvage

187. De novo synthesis of purine nucleotide occurs in

(A) Mitochondria (B) Cytosol
(C) Microsmes (D) Ribosomes

188. The nitrogen atoms for de novo synthesis of purine nucleotides are provided by

(A) Aspartate and glutamate
(B) Aspartate and glycine
(C) Aspartate, glutamine and glycine
(D) Aspartate, glutamate and glycine

189 For de novo synthesis of purine nucleotides, glycine provides

(A) One nitrogen atom
(B) One nitrogen and one carbon atom
(C) Two carbon atoms
(D) One nitrogen and two carbon atoms

190. For de novo synthesis of purine nucleotides, aspartate provides

(A) Nitrogen 1 (B) Nitrogen 3
(C) Nitrogen 7 (D) Nitrogen 9

191. In the purine nucleus, carbon 6 is contributed by

(A) Glycine (B) CO_2
(C) Aspartate (D) Glutamine

192. 5-Phosphoribosyl-1-pyrophosphate is required for the synthesis of

(A) Purine nucleotides (B) Pyrimidine nucleotides
(C) Both (A) and (B) (D) None of these

193. Inosine monophophate is an intermediate during the de novo synthesis of

(A) AMP and GMP (B) CMP and UMP
(C) CMP and TMP (D) All of these

194. Xanthosine monophosphate is an intermediate during de novo synthesis of

(A) TMP (B) CMP
(C) AMP (D) GMP

195. In the pathway of de novo synthesis of purine nucleotides, all the following are allosteric enzymes except

(A) PRPP glutamyl amido transferase
(B) Adenylosuccinate synthetase
(C) IMP dehydrogenase
(D) Adenylosuccinase

196. All of the following enzymes are unique to purine nucleotide synthesis except

(A) PRPP synthetase
(B) PRPP glutamyl amido transferase
(C) Adenylosuccinate synthetase
(D) IMP dehydrogenase

197. PRPP synthetase is allosterically inhibited by

(A) AMP (B) ADP
(C) GMP (D) All of these

198. An allosteric inhibitor of PRPP glutamyl amido transferase is

(A) AMP (B) ADP
(C) GMP (D) All of these

199. An allosteric inhibitor of adenylosuccinate synthetase is

(A) AMP (B) ADP
(C) GMP (D) GDP

200. An allosteric inhibitor of IMP dehydrogenase is

(A) AMP (B) ADP
(C) GMP (D) GDP

201. GMP is an allosteric inhibitor of all the following except

(A) PRPP synthetase
(B) PRPP glutamyl amido synthetase
(C) IMP dehydrogenase
(D) Adenylosuccinate synthetase

202. AMP is an allosteric inhibitor of

(A) PRPP synthetase
(B) Adenylosucciante synthetase
(C) Both (A) and (B)
(D) None of these

203. The first reaction unique to purine nucleotide synthesis is catalysed by

(A) PRPP synthetase
(B) PRPP glutamyl amido transferase
(C) Phosphoribosyl glycinamide synthetase
(D) Formyl transferase

204. Free purine bases which can be salvaged are

(A) Adenine and guanine
(B) Adenine and hypoxanthine
(C) Guanine and hypoxanthine
(D) Adenine, guanine and hypoxanthine

205. The enzyme required for salvage of free purine bases is

(A) Adenine phosphoribosyl transferase
(B) Hypoxanthine guanine phosphoribosyl transferase
(C) Both (A) and (B)
(D) None of these

206. Deoxycytidine kinase can salvage

(A) Adenosine
(B) Adenosine and deoxyadenosine
(C) Adenosine and guanosine
(D) Adenine and adenosine

207. Adenosine kinase can salvage

(A) Adenosine
(B) Adenosine and deoxyadenosine
(C) Adenosine and guanosine
(D) Adenine and adenosine

208. Salvage of purine bases is regulated by

(A) Adenosine phosphoribosyl transferase
(B) Hypoxanthine guanine phosphoribosyl transferase
(C) Availability of PRPP
(D) None of these

209. The available PRPP is used preferentially for

(A) De novo synthesis of purine nucleotides
(B) De novo synthesis of pyrimidine nucleotides
(C) Salvage of purine bases
(D) Salvage of pyrimidine bases

210. The end product of purine catabolism in man is

(A) Inosine (B) Hypoxanthine
(C) Xanthine (D) Uric acid

211. The enzyme common to catabolism of all the purines is

(A) Adenosine deaminase
(B) Purine nucleoside phosphorylase
(C) Guanase
(D) None of these

212. Uric acid is the end product of purine as well as protein catabolism in

(A) Man (B) Fish
(C) Birds (D) None of these

213. Daily uric acid excretion in adult men is

(A) 2–6 mg (B) 20–40 mg
(C) 150–250 mg (D) 40–600 mg

214. Dietary purines are catabolised in

(A) Liver (B) Kidneys
(C) Intesitnal mucosa (D) All of these

215. De novo synthesis of pyrimidine nucleotides occurs in

(A) Mitochondria (B) Cytosol
(C) Microsomes (D) Ribosomes

216. An enzyme common to de novo synthesis of pyrimidine nucleotides and urea is

(A) Urease
(B) Carbamoyl phosphate synthetase
(C) Aspartate transcarbamoylase
(D) Argininosuccinase

217. The nitrogen atoms of pyrimidine nucleus are provided by

(A) Glutamate
(B) Glutamate and aspartate
(C) Glutamine
(D) Glutamine and aspartate

218. The carbon atoms of pyrimidine nucleus are provided by

(A) Glycine and aspartate
(B) CO_2 and aspartate
(C) CO_2 and glutamate
(D) CO_2 and glutamine

219. Nitrogen at position 1 of pyrimidine nucleus comes from

(A) Glutamine (B) Glutamate
(C) Glycine (D) Aspartate

220. Nitrogen at position 3 of pyrimidine nucleus comes from

(A) Glutamine (B) Glutamate
(C) Glycine (D) Aspartate

221. The carbon atom at position 2 of pyrimidine nucleus is contributed by

(A) CO_2 (B) Glycine
(C) Aspartate (D) Glutamine

222. Aspartate contributes the following carbon atoms of the pyrimidine nucelus:

(A) C_2 and C_4 (B) C_5 and C_6
(C) C_2, C_4 and C_6 (D) C_4, C_5 and C_6

223. The first pyrimidine nucleotide to be formed in de novo synthesis pathway is

(A) UMP (B) CMP
(C) CTP (D) TMP

224. Conversion of uridine diphosphate into deoxyuridine diphosphate requires all the following except

(A) Ribonucleotide reductase
(B) Thioredoxin
(C) Tetrahydrobiopterin
(D) NADPH

225. Amethopterin and aminopterin decrease the synthesis of

(A) TMP (B) UMP
(C) CMP (D) All of these

226. For synthesis of CTP and UTP, the amino group comes from

(A) Amide group of Asparagine
(B) Amide group of glutamine
(C) α-Amino group of glutamine
(D) α-Amino group of glutamate

227. CTP synthetase forms CTP from

(A) CDP and inorganic phosphate
(B) CDP and ATP
(C) UTP and glutamine
(D) UTP and glutamate

228. For the synthesis of TMP from dump, a coenzyme is required which is

(A) N^{10}- Formyl tetrahydrofolate
(B) N^5- Methyl tetrahydrofolate
(C) N^5, N^{10}- Methylene tetrahydrofolate
(D) N^5- Formimino tetrahydrofolate

229. All the enzymes required for de novo synthesis of pyrimidine nucleotides are cytosolic except

(A) Carbamoyl phosphate synthetase
(B) Aspartate transcarbamoylase
(C) Dihydro-orotase
(D) Dihydro-orotate dehydrogenase

230. During de novo synthesis of pyrimidine nucleotides, the first ring compound to be formed is

(A) Carbamoyl aspartic acid
(B) Dihydro-orotic acid
(C) Orotic acid
(D) Orotidine monophosphate

231. Tetrahydrofolate is required as a coenzyme for the synthesis of

(A) UMP (B) CMP
(C) TMP (D) All of these

232. All of the following statements about thioredoxin reductase are true except:

(A) It requires NADH as a coenzyme
(B) Its substrates are ADP, GDP, CDP and UDP
(C) It is activated by ATP
(D) It is inhibited by dADP

233. De novo synthesis of pyrimidine nucleotides is regulated by

(A) Carbamoyl phosphate synthetase
(B) Aspartate transcarbamoylase
(C) Both (A) and (B)
(D) None of these

234. Cytosolic carbamoyl phosphate synthetase is inhibited by

(A) UTP (B) CTP
(C) PRPP (D) TMP

235. Cytosolic carbamoyl phosphate synthetase is activated by

(A) Glutamine (B) PRPP
(C) ATP (D) Aspartate

236. Aspartate transcarbamoylase is inhibited by

(A) CTP (B) PRPP
(C) ATP (D) TMP

237. The following cannot be salvaged in human beings:

(A) Cytidine (B) Deoxycytidine
(C) Cytosine (D) Thymidine

238. β -Aminoisobytyrate is formed from catabolism of

(A) Cytosine (B) Uracil
(C) Thymine (D) Xanthine

239. Free ammonia is liberated during the catabolism of

(A) Cytosine (B) Uracil
(C) Thymine (D) All of these

240. β -Alanine is formed from catabolism of

(A) Thymine
(B) Thymine and cytosine
(C) Thymine and uracil
(D) Cytosine and uracil

241. The following coenzyme is required for catabolism of pyrimidine bases:

(A) NADH (B) NADPH
(C) $FADH_2$ (D) None of these

242. Inheritance of primary gout is

(A) Autosomal recessive
(B) Autosomal dominant
(C) X-linked recessive
(D) X-linked dominant

243. The following abnormality in PRPP synthetase can cause primary gout:

(A) High V_{max}
(B) Low K_m
(C) Resistance to allosteric inihbition.
(D) All of these

244. All the following statements about primary gout are true except

(A) Its inheritance is X-linked recessive
(B) It can be due to increased activity of PRPP synthetase
(C) It can be due to increased activity of hypoxanthine guanine phosphoribosyl transferase
(D) De novo synthesis of purines is increased in it

245. All of the following statements about uric acid are true except

(A) It is a catabolite of purines
(B) It is excreted by the kidneys
(C) It is undissociated at pH above 5.8
(D) It is less soluble than sodium urate

246. In inherited deficiency of hypoxanthine guanine phosphoribosyl transferase

(A) De novo synthesis of purine nucleotides is decreased
(B) Salvage of purines is decreased
(C) Salvage of purines is increased
(D) Synthesis of uric acid is decreased

247. All of the following statements about uric acid are true except

(A) It can be formed from allantoin
(B) Formation of uric acid stones in kidneys can be decreased by alkalinisation of urine
(C) Uric acid begins to dissociate at pH above 5.8
(D) It is present in plasma mainly as monosodium urate

248. All of the following statements about primary gout are true except

(A) Uric acid stones may be formed in kidneys
(B) Arthritis of small joints occurs commonly
(C) Urinary excretion of uric acid is decreased
(D) It occurs predominantly in males

249. All of the following statements about allopurinol are true except

(A) It is a structural analogue of uric acid
(B) It can prevent uric acid stones in the kidneys
(C) It increases the urinary excretion of xanthine and hypoxanthine
(D) It is a competitive inhibitor of xanthine oxidase

250. Orotic aciduria can be controlled by

(A) Oral administration of orotic acid
(B) Decreasing the dietary intake of orotic acid
(C) Decreasing the dietary intake of pyrimidines
(D) Oral administration of uridine

251. All of the following occur in orotic aciduria except

(A) Increased synthesis of pyrimidine nucleotides
(B) Increased excretion of orotic acid in urine
(C) Decreased synthesis of cytidine triphosphate
(D) Retardation of growth

252. Inherited deficiency of adenosine deaminase causes

(A) Hyperuricaemia and gout
(B) Mental retardation
(C) Immunodeficiency
(D) Dwarfism

253. Complete absence of hypoxanthine guanine phospharibosyl transferase causes

(A) Primary gout (B) Immunodeficiency
(C) Uric acid stones (D) Lesh-Nyhan syndrome

254. Increased urinary excretion of orotic acid can occur in deficiency of

(A) Orotate phosphoribosyl transferase
(B) OMP decarboxylase
(C) Mitochondrial ornithine transcarbamoylase
(D) Any of the above

255. All of the following can occur in Lesch-Nyhan syndrome except

(A) Gouty arthritis
(B) Uric acid stones
(C) Retarted growth
(D) Self-mutiliating behaviour

256. Inherited deficiency of purine nucleoside phosphorylase causes

(A) Dwarfism (B) Mental retardation
(C) Immunodeficiency (D) Gout

257. Deoxyribonucleotides are formed by reduction of

(A) Ribonucleosides
(B) Ribonucleoside monophosphates
(C) Ribonucleoside diphosphates
(D) Ribonucleoside triphosphates

258. An alternate substrate for orotate phosphoribosyl transferase is

(A) Allopurinol (B) Xanthine
(C) Hypoxanthine (D) Adenine

259. Mammals other than higher primates do not suffer from gout because they

(A) Lack xanthine oxidase
(B) Lack adenosine deaminase
(C) Lack purine nucleoside phosphorylase
(D) Possess uricase

260. Hypouricaemia can occur in

(A) Xanthine oxidase deficiency
(B) Psoriasis
(C) Leukaemia
(D) None of these

261. Synthesis of DNA is also known as

(A) Duplication (B) Replication
(C) Transcription (D) Translation

262. Replication of DNA is

(A) Conservative (B) Semi-conservative
(C) Non-conservative (D) None of these

263. Direction of DNA synthesis is

(A) $5' \rightarrow 3'$ (B) $3' \rightarrow 5'$
(C) Both (A) and (B) (D) None of these

264. Formation of RNA primer:

(A) Precedes replication
(B) Follows replication
(C) Precedes transcription
(D) Follows transcription

265. Okazaki pieces are made up of

(A) RNA (B) DNA
(C) RNA and DNA (D) RNA and proteins

266. Okazaki pieces are formed during the synthesis of

(A) mRNA (B) tRNA
(C) rRNA (D) DNA

267. After formation of replication fork

(A) Both the new strands are synthesized discontinuously
(B) One strand is synthesized continuously and the other discontinuously
(C) Both the new strands are synthesized continuously
(D) RNA primer is required only for the synthesis of one new strand

268. An Okazaki fragment contains about

(A) 10 Nucleotides
(B) 100 Nucleotides
(C) 1,000 Nucleotides
(D) 10,000 Nucleotides

269. RNA primer is formed by the enzyme:

(A) Ribonuclease (B) Primase
(C) DNA polymerase I (D) DNA polymerase III

270. In RNA, the complementary base of adenine is

(A) Cytosine (B) Guanine
(C) Thymine (D) Uracil

271. During replication, the template DNA is unwound

(A) At one of the ends (B) At both the ends
(C) At multiple sites (D) Nowhere

272. During replication, unwinding of double helix is initiated by

(A) DNAA protein (B) DnaB protein
(C) DNAC protein (D) Rep protein

273. For unwinding of double helical DNA,

(A) Energy is provided by ATP
(B) Energy is provided by GTP
(C) Energy can be provided by either ATP or GTP
(D) No energy is required

274. Helicase and DNAB protein cause

(A) Rewinding of DNA and require ATP as a source of energy
(B) Rewinding of DNA but do not require any source of energy
(C) Unwinding of DNA and require ATP as a source of energy
(D) Unwinding of DNA but do not require any source of energy

275. The unwound strands of DNA are held apart by

(A) Single strand binding protein
(B) Double strand binding protein
(C) Rep protein
(D) DNAA protein

276. Deoxyribonucleotides are added to RNA primer by

(A) DNA polymerase I
(B) DNA polymerase II
(C) DNA polymerase III holoenzyme
(D) All of these

277. Ribonucleotides of RNA primer are replaced by deoxyribonucleotides by the enzyme:

(A) DNA polymerase I
(B) DNA polymerase II
(C) DNA polymerase III holoenzyme
(D) All of these

278. DNA fragments are sealed by

(A) DNA polymerase II
(B) DNA ligase
(C) DNA gyrase
(D) DNA topoisomerase II

279. Negative supercoils are introduced in DNA by

(A) Helicase
(B) DNA ligase
(C) DNA gyrase
(D) DNA polymerase III holoenzyme

280. Reverse transcriptase activity is present in the eukaryotic:

(A) DNA polymerase α
(B) DNA polymerase γ
(C) Telomerase
(D) DNA polymerase II

281. DNA polymerase III holoenzyme possesses

(A) Polymerase activity
(B) 3′→5′ Exonuclease activity
(C) 5′→3′ Exonuclease and polymerase activities
(D) 3′→5′ Exonuclease and polymerase activities

282. DNA polymerase I possesses

(A) Polymerase activity
(B) 3′→5′ Exonuclease activity
(C) 5′→3′ Exonuclease activity
(D) All of these

283. 3′→5′ Exonuclease activity of DNA polymerase I

(A) Removes ribonucleotides
(B) Adds deoxyribonucleotides
(C) Corrects errors in replication
(D) Hydrolyses DNA into mononucleotides

284. All of the following statements about RNA-dependent DNA polymerase are true except:

(A) It synthesizes DNA using RNA as a template
(B) It is also known as reverse transcriptase
(C) It synthesizes DNA in 5′→3′ direction
(D) It is present in all the viruses

285. Reverse transcriptase catalyses

(A) Synthesis of RNA
(B) Breakdown of RNA
(C) Synthesis of DNA
(D) Breakdown of DNA

286. DNA A protein can bind only to

(A) Positively supercoiled DNA
(B) Negatively supercoiled DNA
(C) Both (A) and (B)
(D) None of these

287. DNA topoisomerase I of *E. coli* catalyses

(A) Relaxation of negatively supercoiled DNA
(B) Relaxation of positively supercoiled DNA
(C) Conversion of negatively supercoiled DNA into positively supercoiled DNA
(D) Conversion of double helix into supercoiled DNA

288. In mammalian cell cycle, synthesis of DNA occurs during

(A) S phase (B) G_1 phase
(C) Mitotic Phase (D) G_2 phase

289. Melting temperature of DNA is the temperature at which

(A) Solid DNA becomes liquid
(B) Liquid DNA evaporates
(C) DNA changes from double helix into supercoiled DNA
(D) Native double helical DNA is denatured

290. Melting temperature of DNA is increased by its

(A) A and T content (B) G and C content
(C) Sugar content (D) Phosphate content

291. Buoynat density of DNA is increased by its

(A) A and T content (B) G and C content
(C) Sugar content (D) None of these

292. Relative proportions of G and C versus A and T in DNA can be determined by its

(A) Melting temperature
(B) Buoyant density
(C) Both (A) and (B)
(D) None of these

293. Some DNA is present in mitochondria of

(A) Prokaryotes (B) Eukaryotes
(C) Both (A) and (B) (D) None of these

294. Satellite DNA contains

(A) Highly repetitive sequences
(B) Moderately repetitive sequences
(C) Non-repetitive sequences
(D) DNA-RNA hybrids

295. Synthesis of RNA and a DNA template is known as

(A) Replication (B) Translation
(C) Transcription (D) Mutation

296. Direction of RNA synthesis is

(A) 5′ → 3′ (B) 3′ → 5′
(C) Both (A) and (B) (D) None of these

297. DNA-dependent RNA polymerase is a

(A) Monomer (B) Dimer
(C) Trimer (D) Tetramer

298. DNA-dependent RNA polymerase requires the following for its catalytic activity:

(A) Mg^{++} (B) Mn^{++}
(C) Both (A) and (B) (D) None of these

299. The initiation site for transcription is recognized by

(A) α–Subunit of DNA-dependent RNA polymerase
(B) β–Subunit of DNA-dependent RNA polymerase
(C) Sigma factor
(D) Rho factor

300. The termination site for transcription is recognized by

(A) α–Subunit of DNA-dependent RNA polymerase
(B) β–Subunit of DNA-dependent RNA polymerase
(C) Sigma factor
(D) Rho factor

301. Mammalian RNA polymerase I synthesises

(A) mRNA (B) rRNA
(C) tRNA (D) hnRNA

302. Mammalian RNA polymerase III synthesises

(A) rRNA (B) mRNA
(C) tRNA (D) hnRNA

303. In mammals, synthesis of mRNA is catalysed by

(A) RNA polymerase I (B) RNA polymerase II
(C) RNA polymerase III (D) RNA polymerase IV

304. Heterogeneous nuclear RNA is the precursor of

(A) mRNA (B) rRNA
(C) tRNA (D) None of these

305. Post-transcriptional modification of hnRNA involves all of the following except

(A) Addition of 7-methylguanosine triphosphate cap
(B) Addition of polyadenylate tail
(C) Insertion of nucleotides
(D) Deletion of introns

306. Newly synthesized tRNA undergoes post-transcriptional modifications which include all the following except

(A) Reduction in size
(B) Methylation of some bases
(C) Formation of pseudouridine
(D) Addition of C-C-A terminus at 5′ end

307. Post-transcriptional modification does not occur in

(A) Eukaryotic tRNA (B) Prokaryotic tRNA
(C) Eukaryotic hnRNA (D) Prokaryotic mRNA

308. A consensus sequence on DNA, called TATA box, is the site for attachment of

(A) RNA-dependent DNA polymerase
(B) DNA-dependent RNA polymerase
(C) DNA-dependent DNA polymerase
(D) DNA topoisomerase II

309. Polyadenylate tail is not present in mRNA synthesising

(A) Globin (B) Histone
(C) Apoferritin (D) Growth hormone

310. Introns are present in DNA of

(A) Viruses (B) Bacteria
(C) Man (D) All of these

311. A mammalian DNA polymerase among the following is

(A) DNA polymerase α
(B) DNA polymerase I
(C) DNA polymerase II
(D) DNA polymerase IV

312. Mammalian DNA polymerase γ is located in

(A) Nucleus (B) Nucleolus
(C) Mitochondria (D) Cytosol

313. Replication of nuclear DNA in mammals is catalysed by

(A) DNA polymerase α
(B) DNA polymerase β
(C) DNA polymerase γ
(D) DNA polymerase III

314. Primase activity is present in

(A) DNA polymerase II
(B) DNA polymerase α
(C) DNA polymerase β
(D) DNA polymerase δ

315. The mammalian DNA polymerase involved in error correction is

(A) DNA polymerase α
(B) DNA polymerase β
(C) DNA polymerase γ
(D) DNA polymerase δ

316. Novobicin inhibits the synthesis of

(A) DNA (B) mRNA
(C) tRNA (D) rRNA

317. Ciprofloxacin inhibits the synthesis of

(A) DNA (B) mRNA
(C) tRNA (D) rRNA

318. Ciprofloxacin inhibits

(A) DNA topisomerase II
(B) DNA polymerase I
(C) DNA polymerase III
(D) DNA gyrase

319. Rifampicin inhibits

(A) Unwinding of DNA
(B) Initiation of replication
(C) Initiation of translation
(D) Initiation of transcription

320. Actinomycin D binds to

(A) Double stranded DNA
(B) Single stranded DNA
(C) Single stranded RNA
(D) DNA-RNA hybrid

321. DNA contains some palindromic sequences which

(A) Mark the site for the formation of replication forks
(B) Direct DNA polymerase to turn back to replicate the other strand
(C) Are recognized by restriction enzymes
(D) Are found only in bacterial DNA

322. Introns in genes

(A) Encode the amino acids which are removed during post-translational modification
(B) Encode signal sequences which are removed before secretion of the proteins
(C) Are the non-coding sequences which are not translated
(D) Are the sequences that intervene between two genes

323. All of the following statements about post-transcriptional processing of tRNA are true except

(A) Introns of some tRNA precursors are removed
(B) CCA is added at 3′ end
(C) 7-Methylguanosine triphosphate cap is added at 5′ end
(D) Some bases are methylated

324. α-Amanitin inhibits

(A) DNA polymerase II of prokaryotes
(B) DNA polymerase α of eukaryotes
(C) RNA polymerase II of eukaryotes
(D) RNA-dependent DNA polymerase

325. Ciprofloxacin inhibits the synthesis of

(A) DNA in prokaryotes
(B) DNA in prokaryotes and eukaryotes
(C) RNA in prokaryotes
(D) RNA in prokaryotes and eukaryotes

326. All of the following statements about bacterial promoters are true except

(A) They are smaller than eukaryotic promoters
(B) They have two consensus sequences upstream from the transcription star site
(C) TATA box is the site for attachment of RNA polymerase
(D) TATA box has a high melting temperature

327. All of the following statements about eukaryotic promoters are true except

(A) They may be located upstream or down stream from the structural gene
(B) They have two consensus sequences
(C) One consensus sequence binds RNA polymerase
(D) Mutations in promoter region can decrease the efficiency of transcription of the structural gene

328. In sanger's method of DNA sequence determination, DNA synthesis is stopped by using

(A) 1′, 2′- Dideoxyribonucleoside triphosphates
(B) 2′, 3′- Dideoxyribonucleoside triphosphates
(C) 2′, 4′- Dideoxyribonucleoside triphosphates
(D) 2′, 5′ - Dideoxyribonucleoside triphosphates

329. tRNA genes have

(A) Upstream promoters
(B) Downstream promoters
(C) Intragenic promoters
(D) No promoters

330. All of the following statements about tRNA are true except

(A) It is synthesized as a large precursor
(B) It is processed in the nucelolus
(C) It has no codons or anticodons
(D) Genes for rRNA are present in single copies

331. Anticodons are present on

(A) Coding strand of DNA
(B) mRNA
(C) tRNA
(D) rRNA

332. Codons are present on

(A) Non-coding strand of DNA
(B) hnRNA
(C) tRNA
(D) None of these

333. Nonsense codons are present on

(A) mRNA (B) tRNA
(C) rRNA (D) None of these

334. Genetic code is said to be degenerate because

(A) It can undergo mutations
(B) A large proportion of DNA is non-coding
(C) One codon can code for more than one amino acids
(D) More than one codons can code for the same amino acids

335. All the following statements about genetic code are correct except

(A) It is degenerate (B) It is unambigous
(C) It is nearly universal (D) It is overlapping

336. All of the following statements about nonsense codons are true except

(A) They do not code for amino acids
(B) They act as chain termination signals
(C) They are identical in nuclear and mitochondrial DNA
(D) They have no complementary anticodons

337. A polycistronic mRNA can be seen in

(A) Prokaryotes (B) Eukaryotes
(C) Mitochondria (D) All of these

338. Non-coding sequence are present in the genes of

(A) Bacteria (B) Viruses
(C) Eukaryotes (D) All of these

339. Non-coding sequences in a gene are known as

(A) Cistrons (B) Nonsense codons
(C) Introns (D) Exons

340. Splice sites are present in

(A) Prokaryotic mRNA (B) Eukaryotic mRNA
(C) Eukaryotic hnRNA (D) All of these

341. The common features of introns include all the following except

(A) The base sequence begins with GU
(B) The base sequence ends with AG
(C) The terminal AG sequence is preceded by a purine rich tract of ten nucleotides
(D) An adenosine residue in branch site participates in splicing

342. A splice some contains all the following except

(A) hnRNA (B) snRNAs
(C) Some proteins (D) Ribosome

343. Self-splicing can occur in

(A) Some precursors of rRNA
(B) Some precursors of tRNA
(C) hnRNA
(D) None of these

344. Pribnow box is present in

(A) Prokaryotic promoters
(B) Eukaryotic promoters
(C) Both (A) and (B)
(D) None of these

345. Hogness box is present in

(A) Prokaryotic promoters

(B) Eukaryotic promoters
(C) Both (A) and (B)
(D) None of these

346. CAAT box is present in

(A) Prokaryotic promoters 10 bp upstream of transcription start site
(B) Prokaryotic promoters 35 bp upstream of transcription start site
(C) Eukaryotic promoters 25 bp upstream of transcription start site
(D) Eukaryotic promoters 70–80 bp upstream of transcription start site

347. Eukaryotic promoters contain

(A) TATA box 25bp upstream of transcription start site
(B) CAAT box 70-80 bp upstream of transcription start site
(C) Both (A) and (B)
(D) None of these

348. All the following statements about tRNA are correct except

(A) A given tRNA can be charged with only one particular amino acid
(B) The amino acid is recognized by the anticodon of tRNA
(C) The amino acid is attached to end of tRNA
(D) The anticodon of tRNA finds the complementary codon on mRNA

349. All the following statements about charging of tRNA are correct except

(A) It is catalysed by amino acyl tRNA synthetase
(B) ATP is converted into ADP and Pi in this reaction
(C) The enzyme recognizes the tRNA and the amino acid
(D) There is a separate enzyme for each tRNA

350. All the following statements about recognition of a codon on mRNA by an anticodon on tRNA are correct except

(A) The recognition of the third base of the codon is not very precise
(B) Imprecise recognition of the third base results in wobble
(C) Wobble is partly responsible for the degeneracy of the genetic code
(D) Wobble results in incorporation of incorrect amino acids in the protein

351. The first amino acyl tRNA which initiates translation in eukaryotes is

(A) Mehtionyl tRNA
(B) Formylmethionyl tRNA
(C) Tyrosinyl tRNA
(D) Alanyl tRNA

352. The first amino acyl tRNA which initiates translation in prokaryotes is

(A) Mehtionyl tRNA
(B) Formylmethionyl tRNA
(C) Tyrosinyl tRNA
(D) Alanyl tRNA

353. In eukaryotes, the 40 S pre-initiation complex contains all the following initiation factors except

(A) eIF-1A (B) eIF-2
(C) eIF-3 (D) eIF-4

354. Eukaryotic initiation factors 4A, 4B and 4F bind to

(A) 40 S ribosomal subunit
(B) 60 S ribosomal subunit
(C) mRNA
(D) Amino acyl tRNA

355. The codon which serves as translation start signal is

(A) AUG (B) UAG
(C) UGA (D) UAA

356. The first amino acyl tRNA approaches 40 S ribosomal subunit in association with

(A) eIF-1A and GTP (B) eIF-2 and GTP
(C) eIF-2C and GTP (D) eIF-3 and GTP

357. eIF-1A and eIF-3 are required

(A) For binding of amino acyl tRNA to 40 S ribosomal subunit
(B) For binding of mRNA to 40 S ribosomal subunit
(C) For binding of 60 S subunit to 40 S subunit
(D) To prevent binding of 60 S subunit to 40 S subunit

358. eIF-4 A possesses

(A) ATPase activity (B) GTPase activity
(C) Helicase activity (D) None of these

359. eIF-4 B

(A) Binds to 3′ chain initiation codon on mRNA
(B) Binds to 3′ end of mRNA
(C) Binds to 5′ end of mRNA
(D) Unwinds mRNA near its 5′ end

360. Peptidyl transferase activity is present in

(A) 40 S ribosomal subunit
(B) 60 S ribosomal subunit
(C) eEF-2
(D) Amino acyl tRNA

361. After formation of a peptide bond, mRNA is translocated along the ribosome by

(A) eEF-1 and GTP
(B) eEF-2 and GTP
(C) Peptidyl transferase and GTP
(D) Peptidyl transferase and ATP

362. Binding of formylmehtionyl tRNA to 30 S ribosomal subunit of prokaryotes is inhibited by

(A) Streptomycin (B) Chloramphenicol
(C) Erythromycin (D) Mitomycin

363. Tetracyclines inhibit binding of amino acyl tRNAs to

(A) 30 S ribosomal subunits
(B) 40 S ribosomal subunits
(C) 50 S ribosomal subunits
(D) 60 S ribosomal subunits

364. Peptidyl transferase activity of 50 S ribosomal subunits is inhibited by

(A) Rifampicin (B) Cycloheximide
(C) Chloramphenicol (D) Erythromycin

365. Erythromycin binds to 50 S ribosomal sub unit and

(A) Inhibits binding of amino acyl tRNA
(B) Inhibits Peptidyl transferase activity
(C) Inhibits translocation
(D) Causes premature chain termination

366. Puromycin causes premature chain termination in

(A) Prokaryotes (B) Eukaryotes
(C) Both (A) and (B) (D) None of these

367. Diphtheria toxin inhibits

(A) Prokaryotic EF-1 (B) Prokaryotic EF-2
(C) Eukaryotic EF-1 (D) Eukaryotic EF-2

368. The proteins destined to be transported out of the cell have all the following features except

(A) They possess a signal sequence
(B) Ribosomes synthesizing them are bound to endoplasmic reticulum
(C) After synthesis, they are delivered into Golgi apparatus
(D) They are tagged with ubiquitin

369. SRP receptors involved in protein export are present on

(A) Ribosomes
(B) Endoplasmic reticulum
(C) Golgi appartus
(D) Cell membrane

370. The signal sequence of proteins is cleaved off

(A) On the ribosomes immediately after synthesis
(B) In the endoplasmic reticulum
(C) During processing in Golgi apparatus
(D) During passage through the cell membrane

371. The half-life of a protein depends upon its

(A) Signal sequence
(B) N-terminus amino acid
(C) C-terminus amino acid
(D) Prosthetic group

372. Besides structural genes that encode proteins, DNA contains some regulatory sequences which are known as

(A) Operons (B) Cistrons
(C) Cis-acting elements (D) Trans-acting factors

373. Inducers and repressors are

(A) Enhancer and silencer elements respectively
(B) Trans-acting factors

(C) Cis-acting elements
(D) Regulatory proteins

374. cis-acting elements include

(A) Steroid hormones (B) Calcitriol
(C) Histones (D) Silencers

375. Silencer elements

(A) Are trans-acting factors
(B) Are present between promoters and the structural genes
(C) Decrease the expression of some structural genes
(D) Encode specific repressor proteins

376. trans-acting factors include

(A) Promoters (B) Repressors
(C) Enhancers (D) Silencers

377. Enhancer elements have all the following features except

(A) They increase gene expression through a promoter
(B) Each enhancer activates a specific promoter
(C) They may be located far away from the promoter
(D) They may be upstream or downstream from the promoter

378. Amplification of dihydrofolate reductase gene may be brought about by

(A) High concentrations of folic acid
(B) Deficiency of folic acid
(C) Low concentration of thymidylate
(D) Amethopterin

379. Proteins which interact with DNA and affect the rate of transcription possess the following structural motif:

(A) Helix-turn-helix motif
(B) Zinc finger motif
(C) Leucine zipper motif
(D) All of these

380. Lac operon is a cluster of genes present in

(A) Human beings (B) *E. coli*
(C) Lambda phage (D) All of these

381. Lac operon is a cluster of

(A) Three structural genes
(B) Three structural genes and their promoter
(C) A regulatory gene, an operator and a promoter
(D) A regulatory gene, an operator, a promoter and three structural genes

382. The regulatory i gene of lac operon

(A) Is inhibited by lacotse
(B) Is inhibited by its own product, the repressor protein
(C) Forms a regulatory protein which increases the expression of downstream structural genes
(D) Is constitutively expressed

383. RNA polymerase holoenzyme binds to lac operon at the following site:

(A) i gene (B) z gene
(C) Operator locus (D) Promoter region

384. Trancription of z, y and a genes of lac operon is prevented by

(A) Lactose (B) Allo-lactose
(C) Repressor (D) cAMP

385. Transcription of structural genes of lac operon is prevented by binding of the repressor tetramer to

(A) i gene (B) Operator locus
(C) Promoter (D) z gene

386. The enzymes encoded by z, y and a genes of lac operon are inducible, and their inducer is

(A) Lactose
(B) Allo-lactose
(C) Catabolite gene activator protein
(D) All of these

387. Binding of RNA polymerase holoenzyme to the promoter region of lac operon is facilitated by

(A) Catabolite gene activator protein (CAP)
(B) cAMP
(C) CAP-cAMP complex
(D) None of these

388. Lactose or its analogues act as positive regulators of lac operon by

(A) Attaching to i gene and preventing its expression
(B) Increasing the synthesis of catabolite gene activator protein
(C) Attaching to promoter region and facilitating the binding of RNA polymerase holoenzyme
(D) Binding to repressor subunits so that the repressor cannot attach to the operator locus

389. Expression of structural genes of lac operon is affected by all the following except

(A) Lactose or its analogues
(B) Repressor tetramer
(C) cAMP
(D) CAP-cAMP complex

390. The coding sequences in lac operon include

(A) i gene
(B) i gene, operator locus and promoter
(C) z, y and a genes
(D) i, z, y and a genes

391. Mutations can be caused by

(A) Ultraviolet radiation
(B) Ionising radiation
(C) Alkylating agents
(D) All of these

392. Mutations can be caused by

(A) Nitrosamine (B) Dimethyl sulphate
(C) Acridine (D) All of these

393. Nitrosamine can deaminate

(A) Cytosine to form uracil
(B) Adenine to form xanthine
(C) Guanine to form hypoxanthine
(D) All of these

394. Exposure of DNA to ultraviolet radiation can lead to the formation of

(A) Adenine dimers (B) Guanine dimers
(C) Thymine dimers (D) Uracil dimers

395. Damage to DNA caused by ultraviolet radiation can be repaired by

(A) uvr ABC excinuclease
(B) DNA polymerase I
(C) DNA ligase
(D) All of these

396. Xeroderma pigmentosum results from a defect in

(A) uvr ABC excinuclease
(B) DNA polymerase I
(C) DNA ligase
(D) All of these

397. All the following statements about xeroderma pigmentosum are true except

(A) It is a genetic disease
(B) Its inheritance is autosomal dominant
(C) uvr ABC excinuclease is defective in this disease
(D) It results in multiple skin cancers

398. Substitution of an adenine base by guanine in DNA is known as

(A) Transposition (B) Transition
(C) Transversion (D) Frameshift mutation

399. Substitution of a thymine base by adenine in DNA is known as

((A) Transposition (B) Transition
(C) Transversion (D) Frameshift mutation

400. A point mutation results from

(A) Substitution of a base
(B) Insertion of a base
(C) Deletion of a base
(D) All of these

401. Substitution of a base can result in a

(A) Silent mutation (B) Mis-sense mutation
(C) Nonsense mutation (D) All of these

402. A silent mutation is most likely to result from

(A) Substitution of the first base of a codon
(B) Substitution of the third base of a codon
(C) Conversion of a nonsense codon into a sense codon
(D) Conversion of a sense codon into a nonsense codon

403. The effect of a mis-sense mutation can be

(A) Acceptable (B) Partially acceptable
(C) Unacceptable (D) All of these

404. Amino acid sequence of the encoded protein is not changed in

(A) Silent mutation
(B) Acceptable mis-sense mutation
(C) Both (A) and (B)
(D) None of these

405. Haemoglobin S is an example of a/an

(A) Silent mutation
(B) Acceptable mis-sense mutation
(C) Unacceptable mis-sense mutation
(D) Partially acceptable mis-sense mutation

406. If the codon UAC on mRNA changes into UAG as a result of a base substitution in DNA, it will result in

(A) Silent mutation
(B) Acceptable mis-sense mutation
(C) Nonsense mutation
(D) Frameshift mutation

407. Insertion of a base in a gene can cause

(A) Change in reading frame
(B) Garbled amino acid sequence in the encoded protein
(C) Premature termination of translation
(D) All of these

408. A frameshift mutation changes the reading frame because the genetic code

(A) Is degenerate
(B) Is overlapping
(C) Has no punctuations
(D) Is universal

409. Suppressor mutations occur in

(A) Structural genes (B) Promoter regions
(C) Silencer elements (D) Anticodons of tRNA

410. Suppressor tRNAs can neutralize the effects of mutations in

(A) Structural genes (B) Promoter regions
(C) Enhancer elements (D) All of these

411. Mutations in promoter regions of genes can cause

(A) Premature termination of translation
(B) Change in reading frame of downstream structural gene
(C) Decreased efficiency of transcription
(D) All of these

412. Mitochondrial protein synthesis is inhibited by

(A) Cycloheximide (B) Chloramphenicol
(C) Diptheria toxin (D) None of these

413. All of the following statements about puromycin are true except

(A) It is an alanyl tRNA analogue
(B) It causes premature termination of protein synthesis
(C) It inhibits protein synthesis in prokaryotes
(D) It inhibits protein synthesis in eukaryotes

414. Leucine zipper motif is seen in some helical proteins when leucine residues appear at every

(A) 3rd position (B) 5th position
(C) 7th position (D) 9th position

415. Zinc finger motif is formed in some proteins by binding of zinc to

(A) Two cysteine residues
(B) Two histidine residues
(C) Two arginine residues
(D) Two cysteine and two histidine residues or two pairs of two cysteine residues each

416. Restriction endonucleases are present in

(A) Viruses (B) Bacteria
(C) Eukaryotes (D) All of these

417. Restriction endonucleases split

(A) RNA
(B) Single stranded DNA
(C) Double stranded DNA
(D) DNA-RNA hybrids

418. Restriction endonucleases can recognise

(A) Palindromic sequences
(B) Chimeric DNA
(C) DNA-RNA hybrids
(D) Homopolymer sequences

419. All of the following statements about restriction endonucleases are true except:

(A) They are present in bacteria
(B) They act on double stranded DNA
(C) They recognize palindromic sequences
(D) They always produce sticky ends

420. Which of the following is a palindromic sequence

(A) 5′ – ATGCAG – 3′
(B) 3′ – TACGTC – 5′
(C) 5′ – CGAAGC – 3′
(D) 3′ – GCTTCG – 5′

421. In sticky ends produced by restriction endonucleases

(A) The 2 strands of DNA are joined to each other
(B) The DNA strands stick to the restriction endonuclease
(C) The ends of a double stranded fragment are overlapping
(D) The ends of a double stranded fragment are non overlapping

422. All of the following may be used as expression vectors except

(A) Plasmid (B) Bacteriophage
(C) Baculovirus (D) *E. coli*

423. A plasmid is a

(A) Single stranded linear DNA
(B) Single stranded circular DNA
(C) Double stranded linear DNA
(D) Double stranded circular DNA

424. Fragments of DNA can be identified by the technique of

(A) Western blotting (B) Eastern blotting
(C) Northern blotting (D) Southern blotting

425. A particular RNA in a mixture can be identified by

(A) Western blotting (B) Eastern blotting
(C) Northern blotting (D) Southern blotting

426. A radioactive isotope labeled cDNA probe is used in

(A) Southern blotting (B) Northern blotting
(C) Both (A) and (B) (D) None of these

427. An antibody probe is used in

(A) Southern blotting (B) Northern blotting
(C) Western blotting (D) None of these

428. A particular protein in a mixture can be detected by

(A) Southern blotting (B) Northern blotting
(C) Western blotting (D) None of these

429. The first protein synthesized by recombinant DNA technology was

(A) Streptokinase
(B) Human growth hormone
(C) Tissue plasminogen activator
(D) Human insulin

430. For production of eukaryotic protein by recombinant DNA technology in bacteria, the template used is

(A) Eukaryotic gene (B) hnRNA
(C) mRNA (D) All of these

431. Monoclonal antibodies are prepared by cloning

(A) Myeloma cells (B) Hybridoma cells
(C) T-Lymphocytes (D) B-Lymphocytes

432. Myeloma cells are lacking in

(A) TMP synthetase
(B) Formyl transferase
(C) HGPRT
(D) All of these

433. Hybridoma cells are selected by culturing them in a medium containing

(A) Adenine, guanine, cytosine and thymine
(B) Adenine, guanine, cytosine and uracil
(C) Hypoxanthine, aminopterin and thymine
(D) Hypoxanthine, aminopterin and thymidine

434. Myeloma cells and lymphocytes can be fused by using

(A) Calcium chloride (B) Ethidium bromide
(C) Polyethylene glycol (D) DNA polymerase

435. Trials for gene therapy in human beings were first carried out, with considerable success, in a genetic disease called

(A) Cystic fibrosis
(B) Thalassemia
(C) Adenosine deaminase deficiency
(D) Lesch-Nyhan syndrome

436. Chimeric DNA

(A) Is found in bacteriophages
(B) Contains unrelated genes
(C) Has no restriction sites
(D) Is palindromic

437. Which of the following may be used as a cloning vector?

(A) Prokaryotic plasmid (B) Lambda phage
(C) Cosmid (D) All of these

438. The plasmid pBR322 has

(A) Ampicillin resistance gene
(B) Tetracycline resistance gene
(C) Both (A) and (B)
(D) None of these

439. Lambda phage can be used to clone DNA fragments of the size

(A) Upto 3 kilobases (B) Upto 20 kilobases
(C) Upto 45 kilobases (D) Upto 1,000 kilobases

440. DNA fragments upto 45 kilobases in size can be cloned in

(A) Bacterial plasmids
(B) Lambda phage
(C) Cosmids
(D) Yeast artificial chromosomes

441. A cosmid is a

(A) Large bacterial plasmid
(B) Viral plasmid
(C) Hybrid of plasmid and phage
(D) Yeast plasmid

442. Polymerase chain reaction can rapidly amplify DNA sequences of the size

(A) Upto 10 kilobases (B) Upto 45 kilobases
(C) Upto 100 kilobases (D) Upto 1,000 kilobases

443. The DNA polymerase commonly used in polymerase chain reaction is obtained from

(A) *E. coli* (B) Yeast
(C) *T.aquaticus* (D) Eukaryotes

444. Base sequence of DNA can be determined by

(A) Maxam-Gilbert method
(B) Sanger's dideoxy method
(C) Both (A) and (B)
(D) None of these

445. From a DNA-RNA hybrid, DNA can be obtained by addition of

(A) DNA B protein and ATP
(B) Helicase and ATP
(C) DNA topoisomerase I
(D) Alkali

446. Optimum temperature of DNA polymerase of *T. aquaticus* is

(A) 30°C (B) 37°C
(C) 54°C (D) 72°C

447. In addition to Taq polymerase, polymerase chain reaction requires all of the following except

(A) A template DNA
(B) Deoxyribonucleoside triphosphates
(C) Primers
(D) Primase

448. DNA polymerase of T. aquaticus is preferred to that of *E. coli* in PCR because

(A) It replicates DNA more efficiently
(B) It doesn't require primers
(C) It is not denatured at the melting temperature of DNA
(D) It doesn't cause errors in replication

449. Twenty cycles of PCR can amplify DNA:

(A) 2^{20} fold (B) 20^2 fold
(C) 20 x 2 fold (D) 20 fold

450. Transgenic animals may be prepared by introducing a foreign gene into

(A) Somatic cells of young animals
(B) Testes and ovaries of animals
(C) A viral vector and infecting the animals with the viral vector
(D) Fertilised egg and implanting the egg into a foster mother

451. Yeast artificial chromosome can be used to amplify DNA sequences of the size

(A) Upto 10 kb (B) Upto 45 kb
(C) Upto 100 kb (D) Upto 1,000 kb

452. DNA finger printing is based on the presence in DNA of

(A) Constant number of tandem repeats
(B) Varibale number of tandem repeats
(C) Non-repititive sequences in each DNA
(D) Introns in eukaryotic DNA

453. All the following statements about restriction fragment length polymorphism are true except

(A) It results from mutations in restriction sites
(B) Mutations in restriction sites can occur in coding or non-coding regions of DNA
(C) It is inherited in Mendelian fashion
(D) It can be used to diagnose any genetic disease

454. Inborn errors of urea cycle can cause all the following except

(A) Vomiting (B) Ataxia
(C) Renal failure (D) Mental retardation

455. Hyperammonaemia type I results from congenital absence of

(A) Glutamate dehydrogenase
(B) Carbamoyl phosphate synthetase
(C) Ornithine transcarbamoylase
(D) None of these

456. Congenital deficiency of ornithine transcarbamoylase causes

(A) Hyperammonaemia type I
(B) Hyperammonaemia type II
(C) Hyperornithinaemia
(D) Citrullinaemia

457. A ketogenic amino acid among the following is

(A) Leucine (B) Serine
(C) Threonine (D) Proline

458. Carbon skeleton of the following amino acid can serve as a substance for gluconeogenesis

(A) Cysteine (B) Aspartate
(C) Glutamate (D) All of these

459. N-Formiminoglutamate is a metabolite of

(A) Glutamate (B) Histidine
(C) Tryptophan (D) Methionine

460. Methylmalonyl CoA is a metabolite of

(A) Valine (B) Leucine
(C) Isoleucine (D) All of these

461. Homogentisic acid is formed from

(A) Homoserine (B) Homocysteine
(C) Tyrosine (D) Tryptophan

462. Maple syrup urine disease results from absence or serve deficiency of

(A) Homogentisate oxidase
(B) Phenylalanine hydroxylase
(C) Branched chain amino acid transaminase
(D) None of these

463. Which of the following is present as a marker in lysosomal enzymes to direct them to their destination?

(A) Glucose-6-phosphate
(B) Mannose-6-phosphate
(C) Galactose-6-phosphate
(D) N-Acetyl neuraminic acid

464. Marfan's syndrome results from a mutation in the gene coding:

(A) Collagen (B) Elastin
(C) Fibrillin (D) Keratin

465. All the following statements about fibronectin are true except

(A) It is glycoprotein
(B) It is a triple helix
(C) It is present in extra cellular matrix
(D) It binds with integrin receptors of cell

466. Fibronectin has binding sites for all of the following except

(A) Glycophorin (B) Collagen
(C) Heparin (D) Integrin receptor

467. Fibronectin is involved in

(A) Cell adhension (B) Cell movement
(C) Both (A) and (B) (D) None of these

468. Glycoproteins are marked for destruction by removal of their

(A) Oligosaccharide prosthetic group
(B) Sialic acid residues
(C) Mannose residues
(D) N-terminal amino acids

469. Glycophorin is present in cell membranes of

(A) Erythrocytes (B) Platelets
(C) Neutrophils (D) Liver

470. Selectins are proteins that can recognise specific

(A) Carbohydrates (B) Lipids
(C) Amino acids (D) Nucleotides

471. Hunter's syndrome results from absence of

(A) Hexosaminidase A
(B) Iduronate sulphatase
(C) Neuraminidase
(D) Arylsulphatase B

472. A cancer cell is characterized by

(A) Uncontrolled cell division
(B) Invasion of neighbouring cells
(C) Spread to distant sites
(D) All of these

473. If DNA of a cancer cell is introduced into a normal cell, the recipient cell

(A) Destroys the DNA
(B) Loses its ability to divide
(C) Dies
(D) Changes into a cancer cell

474. A normal cell can be transformed into a cancer cell by all of the following except

(A) Ionising radiation
(B) Mutagenic chemicals
(C) Oncogenic bacteria
(D) Some viruses

475. Proto-oncogens are present in

(A) Oncoviruses
(B) Cancer cells
(C) Healthy human cells
(D) Prokaryotes

476. All the following statements about proto-oncogenes are true except

(A) They are present in human beings
(B) They are present in healthy cells
(C) Proteins encoded by them are essential
(D) They are expressed only when a healthy cell has been transformed into a cancer cell

477. Various oncogens may encode all of the following except:

(A) Carcinogens
(B) Growth factors
(C) Receptors for growth factors
(D) Signal transducers for growth factors

478. Ras proto-oncogene is converted into oncogene by

(A) A point mutation
(B) Chromosomal translocation
(C) Insertion of a viral promoter upstream of the gene
(D) Gene amplification

479. Ras proto-oncogene encodes

(A) Epidermal growth factor (EGF)
(B) Receptor for EGF
(C) Signal transducer for EGF
(D) Nuclear transcription factor

480. P 53 gene:

(A) A proto-oncogene
(B) An oncogene
(C) A tumour suppressor gene
(D) None of these

481. Retinoblastoma can result from a mutation in

(A) ras proto-oncogene
(B) erbB proto-oncogene
(C) p 53 gene
(D) RB 1 gene

482 All the following statements about retino blastoma are true except

(A) At least two mutations are required for its development
(B) One mutation can be inherited from a parent

(C) Children who have inherited one mutation develop retinoblastoma at a younger age
(D) RB 1 gene promotes the development of retinoblastoma

483. Ames assay is a rapid method for detection of

(A) Oncoviruses
(B) Retroviuses
(C) Chemical carcinogens
(D) Typhoid

484. Amplification of dihydrofolate reductase gene in a cancer cell makes the cell

(A) Susceptible to folic acid deficiency
(B) Less malignant
(C) Resistant to amethopterin therapy
(D) Responsive to amethopterin therapy

485. Conversion of a procarcinogen into a carcinogen often requires

(A) Proteolysis
(B) Microsomal hydroxylation
(C) Exposure to ultraviolet radiation
(D) Exposure to X-rays

486. The only correct statement about oncoviruses is

(A) All the oncoviruses are RNA viruses
(B) Reverse transcriptase is present in all oncoviruses
(C) Viral oncogenes are identical to human protooncogens
(D) Both DNA and RNA viruses can be oncoviruses

487. RB 1 gene is

(A) A tumour suppressor gene
(B) Oncogene
(C) Proto-oncogene
(D) Activated proto-oncogene

488. Cancer cells may become resistant to amethopterin by

(A) Developing mechanisms to destroy amethopterin
(B) Amplification of dihydrofolate reducatse gene
(C) Mutation in the dihydrofolate reductase gene so that the enzyme is no longer inhibited by amethopterin
(D) Developing alternate pathway of thymidylate synthesis

489. The major source of NH_3 produced by the kidney is

(A) Leucine (B) Glycine
(C) Alanine (D) Glutamine

490. Which of these methyl donors is not a quanternary ammonium compound?

(A) Methionine (B) Choline
(C) Betain (D) Betainaldehyde

491. L-glutamic acid is subjected to oxidative deaminition by

(A) L-amino acid dehydrogenase
(B) L-glutamate dehydrogenase
(C) Glutaminase
(D) Glutamine synthetase

492. A prokaryotic ribosome is made up of _____ sub units.

(A) 20 S and 50 S (B) 30S and 50S
(C) 30S and 60S (D) 20S and 50S

493. AN Eukaryotic ribosome is made up of _____ sub unit.

(A) 40S and 60S (B) 40S and 50S
(C) 40S and 80S (D) 60S and 80S

494. GTP is not required for

(A) Capping L of mRNA
(B) Fusion of 40S and 60S of ribosome
(C) Accommodation of tRNA amino acid
(D) Formation of tRNA amino acid complex

495. The antibiotic which inhibits DNA dependent RNA polymerase is

(A) Mitomycin C (B) Actinomycin d
(C) Streptomycin (D) Puromycin

496. The antibiotic which cleaves DNA is

(A) Actinomycin d (B) Streptomycin
(C) Puromycin (D) Mitomycin C

497. The antibiotic which has a structure similar to the amino acyl end of tRNA tyrosine is

(A) Actinomycin d (B) Streptomycin
(C) Puromycin (D) Mitomycin c

498. ATP is required for

(A) Fusion of 40S and 60S of ribosome
(B) Accommodation tRNA amino acid in a site of ribosome
(C) Movement of ribosome along mRNA
(D) formation of tRNA amino acid complex

499. What is the subcellular site for the biosynthesis of proteins?

(A) Chromosomes (B) Lymosomes
(C) Ribosomes (D) Centrosomes

500. An animal is in negative nitrogen balance when

(A) Intake exceeds output
(B) New tissue is being synthesized
(C) Output exceeds intake
(D) Intake is equal to output

501. When NH_3 is perfused through a dog's liver _____ is formed, while _____ is formed in the birds liver.

(A) Urea, Uric acid (B) Urea, allantoin
(C) Uric acid, creatinine
(D) Uric acid, Urea

502. Aspartate amino transferase uses the following for transamination:

(A) Glutamic acid and pyruvic acid
(B) Glutamic acid and oxaloacetic acid
(C) Aspartic acid and pyruvic acid
(D) aspartic acid and keto adipic acid

503. Which among the following compounds is not a protein?

(A) Insulin (B) Hheparin
(C) Mucin (D) Pepsin

504. Almost all the urea is formed in this tissue:

(A) Kidney (B) Urethra
(C) Uterus (D) Liver

505. A polyribosome will have about _____ individual ribosomes.

(A) 20 (B) 10
(C) 5 (D) 2

506. Progressive transmethylation of ethanolamine gives

(A) Creatinine
(B) Choline
(C) Methionine
(D) N-methyl nicotinamide

507. Genetic information originates from

(A) Cistron of DNA
(B) Codons of mRNA
(C) Anticodons of tRNA
(D) Histones of nucleoproteins

508. The genetic code operates through

(A) The protein moiety of DNA
(B) Cistrom of DNA
(C) Nucleotide sequence of m RNA
(D) The anticodons of tRNA

509. DNA synthesis in laboratory was first achieved by

(A) Watson and crick (B) Khorana
(C) A.Kornberg (D) Ochoa

510. Among the different types of RNA, which one has the highest M.W.?

(A) mRNA (B) rRNA
(C) yeast RNA (D) tRNA

511. From DNA the genetic message is transcribed into this compound:

(A) Protein (B) mRNA
(C) tRNA (D) rRNA

512. This compound has a double helical structure.

(A) Deoxyribonucleic acid
(B) RNA
(C) Flavine-adevine dinucleotide
(D) Nicotinamide adamine dinucleotide

513. The structural stability of the double helix of DNA is as cribbed largely to

(A) Hydrogen bonding between adjacent purine bases
(B) Hydrophobic bonding between staked purine and pyrinuidine nuclei

(C) Hydrogen bonding between adjacent pyrimidine bases
(E) Hydrogen bonding between purine and pyrimidine bases

514. Which of the following statements about nucleic acid is most correct?

(A) Both pentose nucleic acid and deoxypentose nucleic acid contain the same pyrimidines
(B) Both pentose nucleic acid and deoxypentose nucleic acid and deoxypentose nucleic acid Contain the same purines
(C) RNA contains cytosine and thymine
(D) DNA and RNA are hydrolysed by weak alkali

515. Acid hydrolysis of ribonucleic acid would yield the following major products:

(A) d- deoxyribose, cytosine, adenine
(B) d-ribose, thymine, Guanine
(C) d-ribose, cytosine, uracil, thymine
(D) d-ribose, uracil, adenine, guanine, cytosine

516. RNA does not contain

(A) adenine (B) OH methyl cytosine
(C) d-ribose (D) Uracil

517. Which of the following statements is correct?

(A) a nucleo protein usually contain deoxy sugars of the hexose type
(B) Nucleoproteins are usually absent from the cytoplasm
(C) Nucleoproteins usually are present in the nucleus only
(D) Nucleoproteins usually occur in the nucleus and cytoplasm

518. Whcih of the following compound is present in RNA but absent from DNA?

(A) Thymine (B) Cytosine
(C) Uracil (D) Guanine

519. Nucleic acids can be detected by means of their absorption maxima near 260 nm. Their absorption in this range is due to

(A) Proteins
(B) Purines and pyrimidines
(C) Ribose
(D) Deoxyribose

520. Which of the following contains a deoxy sugar?

(A) RNA (B) DNA
(C) ATP (D) UTP

521. DNA is

(A) Usually present in tissues as a nucleo protein and cannot be separated from its protein component
(B) A long chain polymer in which the internucleotide linkages are of the diester type between C-3′ and C-5′
(C) Different from RNA since in the latter the internucleotide linkages are between C-2′ and C-5′
(D) Hydrolyzed by weal alkali (pH_9 to 100°C)

522. Nobody is the name given to

(A) Ribosome (B) Microsome
(C) Centrosome (D) Nucleosome

523. Transcription is the formation of

(A) DNA from a parent DNA
(B) mRNA from a parent mRNA
(C) pre mRNA from DNA
(D) protein through mRNA

524. Translation is the formation of

(A) DNA from DNA
(B) mRNA from DNA
(C) Protein through mRNA
(D) mRNA from pre mRNA

525. Sigma and Rho factors are required for

(A) Replication (B) Transcription
(C) Translation (D) Polymerisation

526. The genine of ϕ×174 bacteriophage is interesting in that if contains

(A) No DNA
(B) DNA with uracil
(C) Single stranded DNA
(D) Triple standard DNA

527. Okasaki fragments are small bits of

(A) RNA
(B) DNA
(C) DNA with RNA heads
(D) RNA with DNA heads

528. In addition to the DNA of nucleus there DNA is

(A) Mitochondrian
(B) Endoplasmic reticulum
(C) Golgi apparatus
(D) Plasma membrane

529. The mitochondrial DNA is

(A) Like the nuclear DNA in structure
(B) Single stranded, linear
(C) Double stranded, circular
(D) Single stranded, circular

530. A synthetic RNA having the sequence of UUUUUU (Poly U) will give a protein having poly _____.

(A) Alamine (B) Phenyl alanine
(C) Glycine (D) Methionine

531. Lac operon of E. coli contains _____ is continuity.

(A) Regulator and operator genes only
(B) Operator and structural genes only
(C) Regular and structural genes only
(D) Regulator, operator and structural genes

532. A mRNA of eukaryotes can code for

(A) Only one polypeptide
(B) Two polypeptides
(C) Three polypeptides
(D) Five polypeptides

533. mRNA of prokaryotes can code for

(A) More than one polypeptide
(B) Only one polypeptide
(C) Many exons and introns
(D) Introns only

534. DNA directed RNA polymerase is

(A) Replicase
(B) Transcriptase
(C) Reverse transcriptase
(D) Polymerase III

535. RNA directed DNA polymerase is

(A) Replicase
(B) Transcriptase
(C) Reversetranscriptase
(D) Polymerase–III

Q536. RNA synthesis requires

(A) RNA primer (B) RNA template
(C) DNA template (D) DNA primer

537. The mRNA ready for protein synthesis has the _____ cap.

(A) ATP (B) CTP
(C) GTP (D) UTP

538. mRNA ready for protein synthesis has the poly _____ toil.

(A) G (B) A
(C) U (D) C

539. The codon for phenyl Alanine is

(A) AAA (B) CCC
(C) GGG (D) UUU

540. Blue print for genetic information residues in

(A) mRNA (B) tRNA
(C) rRNA (D) DNA

541. Genes are

(A) RNA (B) DNA
(C) lipoproteins and (D) Chromoproteins

542. Codons are in

(A) DNA (B) mRNA
(C) tRNA (D) rRNA

543. The genetic code operates via

(A) The protein moiety of DNA
(B) The base sequences of DNA
(C) The nucleotide sequence of mRNA
(D) The base sequence of tRNA

544. Urine bases with methyl substituents occurring in plants are

(A) Caffeine (B) Theophylline
(C) Theobromine (D) All of these

545. Genetic information in human beings is stored in

(A) DNA (B) RNA
(C) Both (A) and (B) (D) None of these

546. All following are naturally occurring nucleotides except

(A) Cyclic AMP
(B) ATP
(C) DNA
(D) Inosine monophosphate

547. If the amino group and a carboxylic group of the amino acid are attached to same carbon atom, the amino acid is called as

(A) Alpha (B) Beta
(C) Gamma (D) Epsilon

548. If in a nucleic acid there are more than 8000 nucleotides it is most likely

(A) RNA (B) DNA
(C) Both (A) and (B) (D) None of these

549. Genetic information in human beings is stored in

(A) RNA (B) DNA
(C) Both (A) and (B) (D) mRNA

550. In RNA, apart from ribose and phosphate, all following are present except

(A) Adenine (B) Guanine
(C) Thymine (D) Cytosine

551. Which of the following gives a positive Ninhydrin test?

(A) Reducing sugar (B) Triglycerides
(C) α-amino acids (D) Phospholipids

552. A Gene is

(A) A single protein molecule
(B) A group of chromosomes
(C) An instruction for making a protein molecule
(D) A bit of DNA molecule

553. In DNA, genetic information is located in

(A) Purine bases
(B) Pyrimidine bases
(C) Purine and pyrimidine bases
(D) sugar

554. Which one of the following is not a constituent of RNA?

(A) Deoxyribose (B) Uracil
(C) Adenine (D) Thymine

555. Which of the following are nucleo proteins?

(A) Protamines
(B) Histones
(C) Deoxy and Ribo nucleo proteins
(D) All of these

556. The total RNA in cell tRNA constitutes

(A) 1–10% (B) 10–20%
(C) 30–50% (D) 50–80%

557. Unit of genetic information:

(A) DNA (B) RNA
(C) Cistron (D) None of these

558. Anticodon sequence are seen in

(A) tRNA and transcribed DNA strand
(B) tRNA and complementary DNA strand
(C) mRNA
(D) mRNA and complementary DNA strand

559. cAMD is destroyed by

(A) Adenylate cyclase
(B) Phosphodiesterase
(C) Synthetase phosphatase
(D) Synthetase kinase

560. Restriction enzymes have been found in

(A) Humans (B) Birds
(C) Bacteria (D) Bacteriophase

561. Sulphur is not present in

(A) Thiamine (B) Lipic acid
(C) Thymine (D) Biotin

562. Which one of the following binds to specific nucleotide sequences?

(A) RNA polymerase (B) Repressor
(C) Inducer (D) Restriction

563. Using written convertion which one of the following sequences is complimentary to TGGCAGCCT?

(A) ACC GTC GGA (B) ACC GUC GGA
(C) AGG CTG CCA (D) TGG CTC GGA

564. Ribosomes similar to those of bacterial found in

(A) Plant nucei
(B) Cardiac muscle cytoplasm
(C) Liver endoplasmic reticulum
(D) Neuronal cytoplasm

565 The mechanism of synthesis of DNA and RNA are similar in all the following ways except

(A) They involve release of pyrophosphate from each nucleotide added
(B) They require activated nucleotide precursor and Mg^{2+}
(C) The direction of synthesis is $5' \rightarrow 3'$
(D) They require a primer

566. Template-directed DNA synthesis occurs in all the following except

(A) The replication fork
(B) Polymerase chain reaction
(C) Growth of RNA tumor viruses
(D) Expression of oneogenes

567. Which one of the following statements correctly describes eukaryotic DNA?

(A) They involve release of pyrophosphate from each nucleotide precussor and Mg^{2+}
(B) The direction of synthesis is
(C) They require a primer $5' \rightarrow 3'$
(D) None of these

568. Which one of the following causes frame shift mutation?

(A) Transition
(B) Transversion
(C) Deletion
(D) Substitution of purine to pyrimidine

569. Catabolism of thymidylate gives

(A) α-alanine
(B) β-alanine
(C) α-aminoisobutyrate
(D) β-aminoisobutyrate

570. Glycine gives _____ atoms of purine.

(A) C_2, C_3 (B) C_4, C_5 and N_7
(C) C_4, C_5 and N_9 (D) C_4, C_6 and N_7

571. A common substrate of HGPRTase, APRTase and PRPP glutamyl amidotransferase is

(A) Ribose 5 phosphate
(B) Phosphoribosyl pyrophosphate
(C) Hypoxanthine
(D) Adenosine

572. Carbon 6-of purine skeleton comes from

(A) Atmospheric CO_2
(B) 1 carbon carried by folate
(C) Betoine
(D) Methionine

573. Uric acid is the catabolic end product of

(A) Porphyrine (B) Purines
(C) Pyrimidines (D) Pyridoxine

574. Diphenylamine method is employed in the quantitation of

(A) Nucleic acid (B) RNA
(C) DNA (D) Proteins

575. Orcinol method is employed in the quantitation of

(A) Nucleic acid (B) DNA
(C) RNA (D) Proteins

576. Nucleic acid show strong absorption at one of the wavelength:

(A) 280 nm (B) 220 nm
(C) 360 nm (D) 260 nm

577. tRNA has

(A) Clover leaf structure
(B) anticodon arm
(C) poly 'A' tay 3'
(D) Cap at 5' end

578. Which one of the following contributes nitrogen atoms to both purine and pyrimidine rings?

(A) Aspartate
(B) Carbanoyl phosphate
(C) Carbondioxide
(D) Tetrahydrofolate

579. The four nitrogen atoms of purines are derived from

(A) Urea and NH_3
(B) NH_3, Glycine and Glutamate
(C) NH_3, Asparate and Glutamate
(D) Aspartate, Glutamine and Glycine

580. A drug which prevents uric acid synthesis by inhibiting the enzyme Xanthine oxidase is

(A) Aspirin (B) Allopurinal
(C) Colchicine (D) Phenyl benzoate

581. Glycine contributes to the following C and N of purine nucleus:

(A) C_1, C_2 and N_7 (B) C_8, C_8 and N_9
(C) C_4, C_5 and N_7 (D) C_4, C_5 and N_9

582. Insoinic acid is the biological precursor of

(A) Cytosine and Uric acid
(B) Adenylve acid and Glucine floc acid
(C) Orotic acid and Uridylic acid
(D) Adenosine acid Thymidine

583. The probable metabolic defect in gents is

(A) A defect in excretion of uric acid by kidney
(B) An overproduction of pyrimidines
(C) An overproduction of uric acid
(D) Rise in calcium leading to deposition of calcium urate

584. In humans, the principal break down product of purines is

(A) NH_3 (B) Allantin
(C) Alanine (D) Uric acid

585. A key substance in the committed step of pyrimidines biosynthesis is

(A) Ribose-5-phosphate
(B) Carbamoyl phosphate
(C) ATP
(D) Glutamine

586. In humans, the principal metabolic product of pyrimidines is

(A) Uric acid (B) Allantoin
(C) Hypoxanthine (D) β-alanine

587. In most mammals, except primates, uric acid is metabolized by

(A) Oxidation to allantoin
(B) Reduction to NH_3
(C) Hydrolysis to allantoin
(D) Hydrolysis to NH_3

588. Two nitrogen of the pyrimidines ring are obtained from

(A) Glutamine and Carbamoyl-p
(B) Asparate and Carbamoyl-p
(C) Glutamate and NH_3
(D) Glutamine and NH_3

589. All are true about lesch-nyhan syndrome except

(A) Produces self-mutilation
(B) Genetic deficiency of the enzyme
(C) Elevated levels of uric acid in blood
(D) Inheritance is autosomal recessive

590. Synthesis of GMP and IMP requires the following:

(A) NH_3 NAD^+, ATP
(B) Glutamine, NAD^+, ATP
(C) NH_3, GTP, $NADP^+$
(D) Glutamine, GTP, $NADP^+$

591. Which pathway is correct for catabolism of purines to form uric acid?

(A) Guanylate→Adenylate→Xanthine→hypoxanthine→Uric acid
(B) Guanylate→inosinate→Xanthine→hypoxanthine→Uric acid
(C) Adenylate→Inosinate→Xanthine hypoxanthine→Uric acid
(D) Adenylate→Inosinate→hypoxanthine Xanthine→Uric acid

592. Polysemes do not contain

(A) Protein (B) DNA
(C) mRNA (D) rRNA

593. The formation of a peptide bond during the elongation step of protein synthesis results in the splitting of how many high energy bonds?

(A) 1 (B) 2
(C) 3 (D) 4

594. Translocase is an enzyme required in the process of

(A) DNA replication
(B) RNA synthesis
(C) Initiation of protein synthesis
(D) Elongation of peptides

595. Nonsense codons bring about

(A) Amino acid activation
(B) Initiation of protein synthesis
(C) Termination of protein synthesis
(D) Elongation of polypeptide chains

596. Which of the following genes of the E.coli "Lac operon" codes for a constitutive protein?

(A) The 'a' gene (B) The 'i' gene
(C) The 'c' gene (D) The 'z' gene

597. In the process of transcription, the flow of genetic information is from

(A) DNA to DNA (B) DNA to protein
(C) RNA to protein (D) DNA to RNA

598. The anticodon region is an important part of the structure of

(A) rRNA (B) tRNA
(C) mRNA (D) hrRNA

599. The region of the Lac operon which must be free from structural gene transcription to occur is

(A) The operator locus
(B) The promoter site
(C) The 'a' gene
(D) The 'i' gene

600. Another name for reverse transcriptase is

(A) DNA dependent DNA polymerase
(B) DNA dependent RNA polymerase
(C) RNA dependent DNA polymerase
(D) RNA dependent RNA polymerase

601. In the 'lac operon' concept, which of the following is a protein?

(A) Operator (B) Repressor
(C) Inducer (D) Vector

602. Degeneracy of the genetic code denotes the existence of

(A) Base triplets that do not code for any amino acids
(B) Codons consisting of only two bases
(C) Codons that include one or more of the unusual bases
(D) Multiple codons for a single amino acid

603. The normal function of *restriction endonucleases* is to

(A) Excise introns from hrRNA
(B) Polymerize nucleotides to form RNA
(C) Remove primer from okazaki fragments
(D) Protect bacteria from foreign DNA

604. In contrast to Eukaryotic mRNA, prokaryotic mRNA is characterized by

(A) Having 7-methyl guanosine triphosphate at the 5′ end
(B) Being polycystronic
(C) Being only monocystronic
(D) Being synthesized with introns

605. DNA *ligase* of E. coli requires which of the following co-factors?

(A) FAD (B) NAD^+
(C) $NADP^+$ (D) NADH

606. Which of the following is transcribed during repression?

(A) Structural gene (B) Promoter gene
(C) Regulator gene (D) Operator gene

607. mRNA is complementary copy of

(A) 5′-3′ strand of DNA^+
(B) 3′-5′ strand of DNA
(C) Antisense strand of DNA
(D) tRNA

608. Synthesis of RNA molecule is terminated by a signal which is recognised by

(A) α-factor (B) β-factor
(C) δ-factor (D) ρ

609. The binding of prokaryotic DNA dependent RNA polymerase to promoter sits of genes is inhibited by the antibiotic:

(A) Streptomycin (B) Rifamcin
(C) Aueromycin (D) Puromycin

610. In E. coli the chain initiating amino acid in protein synthesis is

(A) N-formyl methionine (B) Methionine
(C) Serine (D) Cysteine

611. Amanitin the mushroom poison inhibits

(A) Glycoprotein synthesis
(B) ATP synthesis
(C) DNA synthesis
(D) mRNA synthesis

612. How many high-energy phosphate bond equivalents are required for amino acid activation in protein synthesis?

(A) One (B) Two
(C) Three (D) Four

613. Translation results in the formation of

(A) mRNA (B) tRNA
(C) rRNA (D) A protein molecule

614. Elongation of a peptide chain involves all the following except

(A) mRNA (B) GTP
(C) Formyl-Met-tRNA (D) Tu, TS and G factors

615. The 'rho' (ρ) factor is involved

(A) To increase the rate of RNA synthesis
(B) In binding catabolite repressor to the promoter region
(C) In proper termination of transcription
(D) To allow proper initiation of transcriptide

616. In the biosynthesis of c-DNA, the joining enzyme *ligase* requires

(A) GTP (B) ATP
(C) CTP (D) UTP

617. Which one of the following binds to specific nucleotide sequences that are upstream and most distant from the start site?

(A) RNA polymerase (B) Repressor
(C) Inducer (D) Restriction

618. Using written convention which one of the following sequences is complimentary to TGGCAGCCT?

(A) ACCGTCGGA (B) ACCGUCGGA
(C) AGGCTGCCA (D) TGGCTCGGA

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(A) Plant nuclei
(B) Cardiac muscle cytoplasm
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(A) The replication fork
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(C) Growth of RNA tumor viruses
(D) Expression of oncogenes

ANSWERS

1. B	2. B	3. A	4. C	5. A	6. C
7. B	8. D	9. C	10. D	11. A	12. A
13. A	14. D	15. B	16. A	17. C	18. C
19. A	20. A	21. B	22. C	23. C	24. D
25. C	26. A	27. C	28. B	29. C	30. A
31. D	32. A	33. B	34. A	35. A	36. C
37. C	38. A	39. B	40. D	41. C	42. C
43. B	44. C	45. D	46. B	47. A	48. C
49. B	50. A	51. D	52. B	53. B	54. D
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