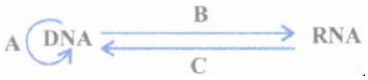
Time : 1 Mins **MOLECULAR BASIS OF INHERITANCE 1 1** **Marks : 1158**

1. During breeding the removal of anthers from a flower is called
   a) Anthesis b) Pollination c) Emasculation d) Vasectomy
2. Polycistronic messenger RNA (mRNA) usually occurs in
   a) bacteria b) prokaryotes c) eukaryotes d) both (a) and (b).
3. Initiation codon of protein synthesis (in eukaryotes) is_____
   a) GUA b) GCA c) CCA d) AUG
4. The given flow chart shows central dogma reverse.



   Enzymes used in processes A, B and C are respectively
   a)

A	B	C
RNA dependent DNA polymerase	DNA dependent RNA polymerase	RNA dependent RNA polymerase

   b)

A	B	C
DNA dependent DNA polymerase	RNA dependent DNA polymerase	DNA dependent RNA polymerase

   c)

A	B	C
DNA dependent DNA polymerase	DNA dependent RNA polymerase	RNA dependent DNA polymerase

   d)

A	B	C
DNA dependent RNA polymerase	DNA dependent DNA polymerase	RNA dependent DNA polymerase

5. F_2 generation in a Mendelian cross showed that both genotypic and phenotypic ratios are same as 1:2:1. It represents a case of:
   a) Monohybrid cross with complete dominance
   b) Monohybrid cross with incomplete dominance c) Co-dominance d) Dihybrid cross
6. What would be the base sequence of RNA transcript obtained from the given DNA segment?
   5' - G C A TT C G G C TAG T A A C - 3' Coding strand of DNA
   3' - C G T A A G C C GAT CAT T G - 5' Non-coding strand of DNA

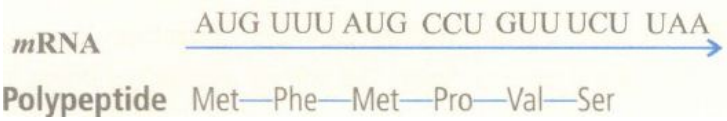
a) 5' - G C A U U C G G C U A G U A A C - 3' b) 5' - C G U AA G C C G AU C AU U G -3'
c) 5' - G C A TT C G G C TAG T A A C - 3' d) 3' - C G T A A G C C GAT CAT T G -5'

7. DNA finger printing was invented by
   a) Kary Mullis b) Alec Jeffery c) Dr. Paul Berg d) Francis Collins

8. Which one of the following pairs of nitrogenous bases of nucleic acids, is wrongly matched with the category mentioned against it?
   a) Thymine, Uracil - Pyrimidines b) Uracil, Cytosine - Pyrimidines
   c) Guanine, Adenine - Purines d) Adenine, Thymine - Purines

9. Linkage is a tendency of alleles of different genes to assort together in :
   a) Meiosis b) Mitosis c) X-Y linkage d) Inversion

10. Read the sequence of nucleotides in the given segment of mRNA and the respective amino acid sequence in the polypeptide chain to answer the Q. nos. 65 and 66.



   Nucleotide sequence of the DNA strand from which this mRNA was transcribed is
   a) TAC AAA TAC GGA CAA AGA ATT b) AUG UUU AUG CCU GUU UCU UAA
   c) UAC AAA UAC GGA CAA AGA AUU d) ATG TTT ATG CCT GTT TCT TAA.

11. Methyl guanosine triphosphate is added to the 5' end of hnRNA in a process of
   a) splicing b) capping c) tailing d) none of these.

12. Which of the following statements is the most appropriate for sickle cell anaemia?
   a) It cannot be treated with iron supplements. b) It is a molecular disease.
   c) It confers resistance to acquiring malaria. d) All of the above.

13. Spliceosomes are not found in cells of____
   a) Fungi b) Animals c) Bacteria d) plants

14. Biochemical characterisation of transforming principle was done by
   a) Hershey and chase b) Morgan c) Meischer d) Avery, MacLeod and McCarty

15. Histone proteins are
   a) basic, negatively charged b) basic, positively charged c) acidic, positively charged
   d) acidic, negatively charged.

16. Largest gene of human genome is _____ and it is located on _____ chromosome.
   a) DMD, X b) TDF, Y c) Sry, X d) Sxl, X

17. Read the following four statements (A - D).
   (A) In transcription, adenosine pairs with uracil
   (B) Regulation of lac operon by repressor is referred to as positive regulation
   (C) The human genome has approximately 50,000 genes
   (D) Haemophilia is a sex-linked recessive disease
   How many of the above statements are right?
   a) Two b) Three c) Four d) One

18. If the sequence of nitrogen bases of the coding strand of DNA in a transcription unit is: 5' - A T G A A T G - 3', the sequence of bases in its RNA transcript would be:

a) 5' - AU G A AU G - 3' b) 5' - U A C U U A C- 3' c) 5' - C A U U C A U - 3'
d) 5'-GUAAGUA-3'.

19. In a mutational event, when adenine is replaced by guanine, it is a case of_____
a) frame shift mutation b) transcription c) transition d) transversion

20. How many pairs of contrasting characters in pea plants were studied by Mendel in his experiments?
a) Six b) Eight c) Seven d) Five

21. Anticodon is an unpaired triplet of bases in an exposed position of____
a) mRNA b) rRNA c) tRNA d) sRNA

22. Match the terms in Column-I with their description in Column-II and choose the correct option:

Column-I		Column-II	
(a)	Dominance	(i)	Many genes govern a single character
(b)	Codominance	(ii)	In a heterozygous organism only one allele expresses itself
(c)	Pleiotropy	(iii)	In a heterozygous organism both alleles express themselves fully
(d)	Polygenic inheritance	(iv)	A single gene influence many characters

a)

(a)	(b)	(c)	(d)
ii	i	iv	iii

b)

(a)	(b)	(c)	(d)
ii	iii	iv	i

c)

(a)	(b)	(c)	(d)
iv	i	ii	iii

d)

(a)	(b)	(c)	(d)
iv	iii	i	ii

23. The unequivocal proof of DNA as the genetic material came from studies on a
a) Viriod b) Bacterial virus c) Bacterium d) Fungus

24. A codon is made up of
a) single nucleotide b) two nucleotides c) three nucleotides d) four nucleotides

25. A nutritionally wild type organism, which does not require any additional growth supplement is known as:
a) prototroph b) phenotype c) Holotype d) Auxotroph

26. Genetic drift operates in :
a) Non- reproductive population b) slow reproductive population
c) Small isolated population d) Large isolated population

27. Whose experiments cracked DNA and discovered triplet nature of genetic code?
a) Nirenberg and Mathaei b) Beadle and Tatum c) Hershey and Chase
d) Morgan and Sturtevant

28. While analysing the DNA of an organism a total number of 5386 nucleotides were found out of which the proportion of different bases were: Adenine = 29%, Guanine = 17%, Cytosine = 32%, Thymine = 17%. Considering the Chargaff's rule it can be concluded that
a) it is a double stranded circular DNA b) it is single stranded DNA
c) it is a double stranded linear DNA d) no conclusion can be drawn.

29. Translation refers to the process of-
a) Polymerisation of nitrogen bases b) Polymerisation of nucleotides
c) Polymerisation of nucleosides d) Polymerisation of amino acids

30. One of the following is true with respect to AUG

a) it codes for methionine only b) it is also an initiation codon
c) it codes for methionine in both prokaryotes and eukaryotes d) all of the above

31. Removal of introns andioining of exons in a defined order during transcription is called ___
a) Looping b) Inducing c) Slicing d) Splicing

32. t-RNA attach to larger subunit of ribosome with the help of which loop
a) DHU-loop b) TΨC loop c) Anticodon loop d) Minor loop

33. Which of the following statements is correct regarding ribosomes?
a) Most of a cell's DNA molecule are stored there.
b) Complete polypeptide is released from there. c) mRNAs are produced there.
d) DNA replication takes place there.

34. Which is incorrect for genetic code-
(a) (i) The codon is triplet
(b) (ii) 64 codons code for amino acids
(c) (iii) Genetic code is unambiguous
(iv) Genetic code is nearly universal
(d) (v) AUG has dual functions
a) only ii b) ii & iii c) iii, iv + v d) All are correct

35. Fruit colour in squash is an example of
a) Recessive epistasis b) Dominant epistasis c) Complementary genes
d) Inhibitory genes

36. Double helix model of DNA which was proposed by watson and crick was of
a) C-DNA b) B-DNA c) D-DNA d) Z-DNA

37. No. of Bar Body in XXXX female
a) 1 b) 2 c) 3 d) 4

38. Gametes of AaBb individual can be:
a) Aa, Bb b) AB, ab c) AB, ab, aB d) AB, Ab, aB, ab

39. If Meselson and Stahl's experiment is continued for four generations in bacteria, the ratio of $^{15}N/^{15}N$: $^{15}N/^{14}N$: $^{14}N/^{14}N$ containing DNA in the fourth generation would be
a) 1: 1: 0 b) 1: 4: 0 c) 0: 1: 3 d) 0: 1: 7.

40. Which of the following is not produced by E.Coli in the lactose operon
a) β galactosidase b) Thiogalactoside transcetylase c) Lactose dehydrogenase
d) Lactose permease

41. **Assertion:** Lac operon is a repressible operon.
Reason: The product of gene activity stops the activity of the said gene.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reasonare true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reasonare false

42. The experimental proof for semicon servative replication of DNA was first shown in a_____ .
a) plant b) bacterium c) fungus d) virus

43. Who rediscovered the results of Mendel's experiments:

a) DeVries, Tschemark, Correns b) DeVries, Tschemark, Morgan

c) Tschemark, Morgan, Correns d) Tschemark, Bateson, Punnet

44. If the sequence of bases in one strand of DNA is ATGCATGCA, what would be the sequence of bases on complementary strand?
    a) ATGCATGCA b) AUGCAUGCA c) TACGTACGT d) UACGUACGU
45. How many different kinds of gametes will be produced by a plant having the genotype AABbCC?
    a) Three b) Four c) Nine d) Two
46. Heterochromatin is
    a) Genetically active b) Transcriptionally inactive c) Lightly stained
    d) With loosely coiled DNA
47. The segment of master stand of DNA involved In transcription is called
    a) Sense strand b) Cistron c) Recon d) Muton
48. Which one of the following is wrongly matched?
    a) Transcription - Writing information from DNA to tRNA.
    b) Translation - Using infomation in mRNA to make protein
    c) Repressorprotein- Binds to operator to stop enzyme synthesis
    d) Operon - Structural genes, operator and prouoter
49. Grey is dominant (G) over black (g). Which of the following will most probably give 50% black and 50% grey offspring?
    a) GG x gg b) Gg x gg c) GG x Gg d) gg x gg
50. When a plant have two alleles of contrasting characters it is called
    a) Homazygous b) Dioecious c) Heterozygous d) Monoecious
51. A tall true breeding garden pea plant is crossed with a dwarf true breeding garden pea plant. When the F_1 Plant were selfed the resulting genotype were in the ratio of:
    a) 1:2:1 :: Tall homozygous : Tall heterozygous : Dwarf
    b) 1:2:1 :: Tall heterozygous : Tall homozygous : Dwarf c) 3:1 :: Tall : Dwarf
    d) 3:1 :: Dwarf : Tall
52. Inducible operon system usually occurs in_____(i)_____pathways. Nutrient molecules serve as_____(ii)_____to stimulate production of the enzymes necessary for their breakdown. Genes for inducible operon are usually switched_____(iii)_____and the repressor is synthesised in an_____(iv)_____form.

a)

(i)	**(ii)**	**(iii)**	**(iv)**
anabolic	corepressor	on	inactive

b)

(i)	**(ii)**	**(iii)**	**(iv)**
anabolic	inducer	off	active

c)

(i)	**(ii)**	**(iii)**	**(iv)**
catabolic	inducer	off	active

d)

(i)	**(ii)**	**(iii)**	**(iv)**
catabolic	corepressor	on	inactive

53. The number of linkage groups in a cell have 10 pairs of chromosomes are:
    a) 5 b) 10 c) 15 d) 20

54. If number of aminoacids in a polypeptide chain is 50, what will be the number of nucleotides in its mRNA?
a) 50 b) 100 c) 150 d) 200

55. Which of the following cannot act as inducer?
a) Lactose b) Galactose c) Both (a) and (c) d) Glucose

56. m-RNA is attached with-
a) E.R b) Ribosome c) Nucleus d) Lysosome

57. Other than DNA polymerase, which of the following enzymes involved in DNA synthesis?
a) Topoisomerase b) Helicase c) RNA primase d) All of these

58. Which of the following statements is correct?
a) Adenine pairs with thymine through three H-bonds
b) Adenine does not pair with thymine c) Adenine pairs with thymine through two H-bonds
d) Adenine pairs with thymine through one H-bond.

59. Which of the following differences are incorrect between leading and lagging strands of DNA?

	Leading strand	**Lagging strand**
(i)	It does not require DNA ligase for its growth.	DNA ligase is required for joining Okazaki fragments.
(ii)	Formation of leading strand is slower.	Formation of lagging strand is quite rapid
(iii)	Its template opens in 5'⟶ 3' direction.	Its template opens in 3' ⟶ 5' direction.
(iv)	Formation of leading strand begins immediately at the beginning of replication.	Formation of lagging strand begins a bit later than that of leading strand.

a) (ii) and (iv) only b) (ii), (iii) and (iv) only c) (ii) and (iii) only d) (i), (ii) and (iii) only

60. You have created a fusion between trp operon and lac operon which encodes the enzymes for tryptophan biosynthesis, under the regulatory control of the lac operator. Under which of the following conditions will tryptophan synthase be induced in the strain that carries the chimeric operator fused operons?
a) Only when both lactose and glucose are absent.
b) Only when both lactose and glucose are present.
c) Only when lactose is absent and glucose is present
d) Only when lactose is present and glucose is absent.

61. Nucleic acids are made up of
a) Amino acids b) Pentose sugars c) Nucleosides d) Nucleotides

62. **Assertion:** The mechanism of DNA replication is semi- conservative in nature.
Reason : Each of the complementary strands of the parental double helix is conserved during the process
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reasonare true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reasonare false

63. A useful process for determining whether an individual is homozygous or heterozygous is:
a) Cross-breeding b) self fertilization c) Back-crossing d) Test cross

64. Hypertrichosis is
a) Holandric character b) X-Linked character c) Diagenic character
d) Sex-influened character

65. When a heterozygous tall pea plant of F_1 generation upon self fertilization produces tall and dwarf phenotypes it proves the principle of
a) Dominance b) Segregation c) Independant assortement
d) Inheritance & purity of gameters

66. Which one is not a part of transcription unit in DNA?
a) The inducer b) Promoter c) Terminator d) Structural gene

67. Match column I with column II and select the correct option from the given codes.

	Column I		**Column II**
A.	Sigma factor	(i)	5'-3'
B.	Capjling	(ii)	Initiation
C.	Tailing	(iii)	Termination
D.	Coding strand	(iv)	5' end
		(v)	3' end

a) A-(iii), B-(v). C-(iv), D-(ii) b) A-(ii), B-(iv), C-(v). D-(i) c) A-(ii), B-(iv), C-(v). D-(iii)
d) A-(iii), B-(v). C-(iv), D-(i)

68. Find the correct match.

Column I	Column II
a. Non degenerate codon	(i) GUG
b. Ambiguous codon	(ii) UAG
c. Amber	(iii) UGG
d. Ochre	(iv) UGA
	(v) UAA

a) a(iii), b(i), c(ii), d(v) b) a(i), b(ii), c(v), d(iii) c) a(iii), b(i), c(iv), d(v)
d) a(iii), b(i), c(v), d(ii)

69. In the base sequence of one strand of DNA is GAT, TAG, CAT, GAC what shall be the sequence of its complementary strand:
a) CAT, CTG, ATC, GTA b) GTA, ATC, CTG, GTA c) ATC, GTA, CTG, GTA
d) CTA, ATC, GTA, CTG

70. First experimental proof for semi-conservative DNA replication was shown in
a) Streptococcus pneumoniae b) Escherichia coli c) Neurospora crassa
d) Rattus rattus

71. Synthesis of DNA from RNA is explained by:
a) central dogma reverse b) reverse transcription c) teminism d) all of these

72. Control of gene expression takes place at the level of
a) DNA-replication b) transcription c) translation d) none of the above.

73. Genes that are involved in turning on or off the transcription of a set of structural genes are called_____
a) polymorphic genes b) operator genes c) reductant genes d) regulatory genes

74. When the codon of mRNA is 5'-GUC-3' then the anticodon on tRNA will be
a) 5'-CAG-3' b) 3'-CAG-5' c) 3'-CUG-5' d) 3'-CUG-5'

75. Which of the following is required as inducers) for the expression of lac operon?
a) Glucose b) Galactose c) Lactose d) Lactose and galactose

76. The process of copying genetic information from one strand of DNA to RNA is termed as_____ .
a) replication b) transcription c) translation d) reverse transcription

77. Botanical name of pea plant is
a) Pisum sativum b) Pinus sativus c) Pyrus sativus d) Pisum sativus

78. DNA ligase is involved in
a) Formation of RNA primer b) Filling of gaps c) Joining of Okazaki fragments
d) Both (1) & (2)

79. How many linkage group are these in nuclear bacteria
a) One b) Two c) Four d) None

80. Transcription unit
a) starts with TATA box b) starts with palindrome regions and ends with rho factor
c) starts with promoter region and ends in terminator region d) starts with CAAT region.

81. Chemically, RNA is_____(i)_____reactive and_____(ii)_____ stable as compared to DNA.
a) (i) equally, (ii) equally b) (i) less, (ii) more c) (i) more, (ii) less d) (i) more, (ii) equally

82. Extranuclear inheritance occurs in_____
a) peroxisome and ribosome b) chloroplast and mitochondria
c) mitochondria and ribosome d) chloroplast and lysosome

83. In cells of superfemale with 47 chromosomes (44+xxx) visible barr bodies are
a) 1 b) 0 c) 2 d) 3

84. Separation of DNA fragments into bands by electrophoresis is done on
a) Agarose gel b) Polyacrylamide gel c) Aminobenzyloxymethyl gel d) Both (1) & (2)

85. In pea plant, yellow seeds are dominant to green. If a heterozygous yellow seeded plant is crossed with a green seeded plant, what ratio of yellow and green seeded plants would you expect in F_1 generation:
a) 50:50 b) 9:1 c) 1:3 d) 3:1

86. Double helix model of DNA
a) Was given by Watson and Crick b) Suggests '3D' structure c) Was given for B-DNA
d) All of these

87. Match column I with column II and select the correct option from the given codes.

	Column I		**ColumnII**
A.	Translation	(i)	Aminoacyl tRNA synthetase
B.	Transcription	(ii)	Okazaki fragments

	Column I		ColumnII
C.	DNA replication	(iii)	RNA polymeras

a) A-(ii), B-(i), C-(iii) b) A-(i), B-(iii), C-(ii) c) A-(iii), B-(i), C-(ii) d) A-(ii), B-(iii), C-(i)

88. Select the two correct statements out of the four (a - d) given below about lac operon_____
(i) Glucose or galactose may bind with the repressor and inactivate it
(ii) In the absence of lactose the repressor binds with the operator region
(iii) The z-gene codes for pennease
(iv) This was elucidated by Francois Jacob and Jacque Monod
The correct statements are
a) (ii) and (iii) b) (i) and (iii) c) (ii) and (iv) d) (i) and (ii)

89. Select the correct statements regarding the process of transcription in eukaryotes.
(i) The strand of dsDNA which takes part in transcription process is called as coding strand.
(ii) The enzyme RNA polymerase can catalyse polymerisation only in one direction i.e., 5'⟶3'.
(iii) An unusual nucleotide methyl guanosine triphosphate is added to the 5' end of hnRNA during capping.
(iv) During tailing process, adenylate residues (200 - 300) are added at 3' end in a template independent manner.
a) (i) and (ii) b) (iii) and (iv) c) (ii), (iii) and (iv) d) (i), (ii), (iii) and (iv)

90. In Drosophila male differentiation is controlled by
a) No.of Y-chromosome b) No.of X-chromosome
c) Ratio between number of X-chromosome and the set of autosome d) Sets of autosome

91. The process involved in the RNA formation on the DNA template
a) Translation b) Transduction c) Transcription d) Transformaion

92. DNA elements, which can switch their position, are called_____ .
a) exons b) introns c) cistrons d) transposons

93. In India, the organisation responsible for assessing the safety of introducing genetically modified organisms for public use is____
a) Research Committee on Genetic Manipulation (RCGM)
b) Council for Scientific and Industrial Research (CSIR)
c) Indian Council of Medical Research (ICMR)
d) Genetic Engineering Approval Committee (GEAC)

94. Semi-conservative replication of DNA was first demonstrated in_____
a) Escherichia coli b) Streptococcus pneumoniae c) Salmonella typhimurium
d) Drosophila melanogaster

95. Basis of DNA fingerprinting is:
a) Relative proportion of purines and pyrimidines
b) Relative difference in DNA occurrence in blood skin and saliva
c) Relative amounts of DNA in ridges and grooves of fingerprints
d) Satellite DNA occurring as highly repeated short DNA segments

96. To initiate translation, the mRNA first binds to
a) the smaller ribosomal sub-unit b) the larger ribosomal sub-unit c) the whole ribosome
d) no such specificity exists.

97. DNA as an acidic substance present in nucleus was first identified by in _____1869; he named it as __.
a) Meischer, nuclein b) Watson and Crick, DNA c) Chargaff, nuclein
d) Wilkins and Franklin, double helix

98. Repressible operon system is usually found in___(i)___pathways. The pathway's end product serves as a___(ii)___to activate the repressor, turn off enzyme synthesis and prevent overproduction of the end product of the pathway. Genes for this operon are usually switched___(iii)___and the repressor is synthesised in an___(iv)___form.

a)

(i)	(ii)	(iii)	(iv)
anabolic	corepressor	on	inactive

b)

(i)	(ii)	(iii)	(iv)
anabolic	inducer	off	active

c)

(i)	(ii)	(iii)	(iv)
catabolic	inducer	off	active

d)

(i)	(ii)	(iii)	(iv)
catabolic	corepressor	on	inactive

99. Which is the most common mechanism of genetic variation in the population of sexually reproducing organism?
a) Chromosomal aberrations b) Genetic drift c) Recombination d) Tranduction

100. In a dihybrid cross between AABB and aabb the ratio of AABB, AABb, aabb in F_2 generation is
a) 9:3:3:1 b) 1:1:1:1 c) 1:2:2:1 d) 1:1:2:2

101. Which is not involved in protein synthesis?
a) Transcription b) Initiation c) Elongation d) Termination

102. The year 2003 was celebrated as the 50th anniversary of discovery of
a) transposons by Barbara Mc Clintock b) structure of DNA by Watson and Crick
c) Mendel's laws of inheritance d) biotechnology by Kary Mullis.

103. T.O. Diener discovered a_____
a) free infectious DNA b) infectious protein c) bacteriophage d) free infectious RNA

104. Select the correct statement_____ .
a) Spliceosomes take part in translation
b) Punnett square was developed by a British scientist
c) Fran'tin Stahl coined the term 'linkage' d) Transduction was discovered by S. Altman.

105. A sequential expression of a set of human genes _____ .
a) messenger RNA b) DNA sequence c) ribosome d) transfer RNA

106. Triticale, the first man-made cereal crop, has been obtained by crossing wheat with-
a) Rye b) Pearl millet c) Sugarcane d) Barley

107. Satellite DNA is classified on the basis of
a) Length b) Base composition c) Number of repetitive units d) All of these

108. The first genetic material could be
a) protein b) carbohydrates c) DNA d) RNA.

109. Which one of the following does not follow the central dogma of molecular biology?
a) Pea b) Mucor c) Chlamydomonas d) HIV

110. Bond formed between two adjacent nucleotides of DNA strand is

a) Glycosidic linkage b) Peptide bond c) Phosphodiester bond d) H-bond

111. Removal of RNA polymerase III from nucleoplasm will affect the synthesis of_____
a) tRNA b) hnRNA c) mRNA d) rRNA

112. Blotting technique involves transfer of DNA from
a) Membrane to gel b) Gel to membrane c) Sol to gel d) Gel to sol

113. Prokaryotic topolsomerase is
a) Helicase b) Prlmase c) DNA polymerase d) DNA gyrase

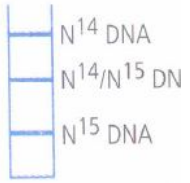
114. Transformation experiment was first performed on which bacteria?
a) E.coli b) Diplococcus pneumoniae c) Salmonella d) Pasteurella pestis

115. Protein synthesis in an animal cell takes place_____
a) only in the cytoplasm b) in the nucleolus as well as in the cytoplasm
c) in the cytoplasm as well as in mitochondria d) only on ribosomes attached to a nucleus

116. Sickle cell anemia is
a) Characterized by elongated sickle like RBCs with a nucleus
b) An autosomal linked dominant trait
c) Caused by substitution of valine by glutamic acid in the beta globin chain of haemoglobin
d) Caused by a change in a single base pair of DNA

117. Regulatory proteins are the accessory proteins that interact with RNA polymerase and affect its role in transcription. Which of the following statements is correct about regulatory protein?
a) They only increase expression. b) They only decrease expression.
c) They interact with RNA polymerase but do not affect the expression.
d) They can act both as activators and as repressors.

118. The semi-conservative nature of DNA replication was established by Meselson and Stahl in their classic experiment with bacteria. They grew bacteria in N^{15}– NH_4Cl containing medium, washed and then incubated in fresh medium with N14 - containing compounds and allowed to grow for three generations. CsCl density gradient centrifugation of isolated DNA established the nature of semiconservative DNA replication. The pictorial representation below shows the position of differentially labeled DNA in CsCl density gradient.



Had the DNA replication been conservative, what would have been the pattern?

a)  b)  c)  d) 

119. AGGTATCGCAT is sequence from the coding strand of a gene. What will be the corresponding sequence of the transcribed mRNA?
a) ACCUAUGCCU b) UGTUTCGCAT c) UGTUTCGCAT d) UCCAUAGCGU

120. Human genome consists of approximately
a) 3 x 10^9 bp b) 6 x 10^9 bp c) 20,000 - 25,000 bp d) 2.2 x 10^4 bp.

121. Because most of the amino acids are represented by more than one codon, the genetic code is_____
a) overlapping b) wobbling c) degenerate d) generate

122. The differences between mRNA and tRNA are that ribosome.
(i) mRNA has more elaborated 3-dimensional structure due to extensive base-pairing
(ii) tRNA has more elaborated 3-dimensional structure due to extensive base-pairing
(iii) tRNA is usually smaller than mRNA
(iv) mRNA bears anticodon but tRNA has codons.
a) (i) and (ii) b) (ii) and (iii) c) (i), (ii) and (iii) d) (i),(ii),(iii) and (iv)

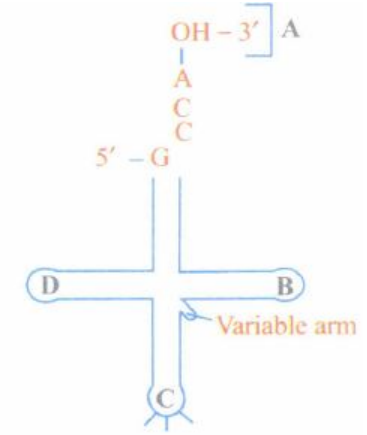
123. Which statement is incorrect for lac operon?
a) Repressor protein is the product of i-gene b) β-galactosidase is synthesized by lac Y
c) Repressor binds operator gene d) Lactose acts as inducer

124. If one strand of DNA has the nitrogenous base sequence at ATCTG what would be the complementary RNA strand sequence_____
a) TTAGIT b) UAGAC c) AACTG d) ATCGU

125. Which of the following bond is not related to nucleic acid:
a) H-bond b) Ester bond c) Glycosidic bond d) Peptide bond

126. Back bone in structure of DNA molecule is made up of-
a) Pentose Sugar and phosphate b) Hexose sugar and phosphate
c) Purine and purimidine d) Sugar and phosphate

127. Identify the labels A, B, C and D in the given structure of tRNA and select the correct option.



a)

A	B	C	D
Anticodon loop	TΨ C loop	AA binding site	DHU loop

b)

A	B	C	D
AA binding site	TΨ C loop	Anticodon loop	DHU loop

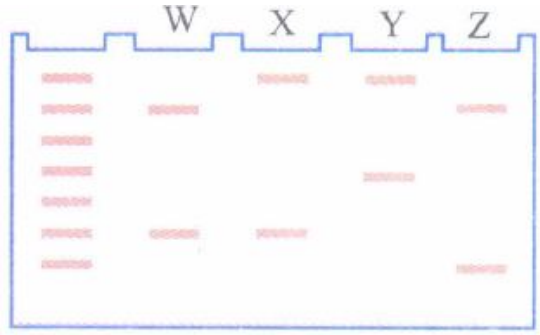
c)

A	B	C	D
AA binding site	DHU loop	Anticodon loop	TΨ C loop

d)

A	B	C	D
AA binding site	DHU loop	T'Ψ C loop	Anticodon loop

128. The DNA fingerprinting analysis of four family members is shown below.



Study the band pattern obtained and assign each family member to W, X, Y and Z. Choose the correct option.

a) W - father X - mother Y - child Z - paternal uncle

b) W - child X - father Y - mother Z - maternal uncle

c) W - father X - child Y - mother Z - paternal uncle

d) W - child X - father Y - maternal uncle Z - mother

129. A nucleotide is formed of____

a) purine, pyrimidine and phosphate b) purine, sugar and phosphate

c) nitrogen base, sugar and phosphate d) pyrimidine, sugar and phosphate

130. **Assertion :** The sugar phosphate backbone of two chains in DNA double helix show anti-parallel polarity.

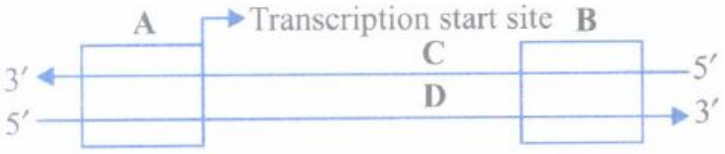
Reason: The phosphodiester bonds in one strand go from a 3' carbon of one nucleotide to a 5' carbon of adjacent nucleotide, whereas those in complementary strand go vice versa.

a) If both assertion and reason are true and reason is the correct explanation of assertion.

b) If both assertion and reasonare true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false. d) If both assertion and reasonare false

131. Given diagram represents the components of a transcription unit. Select the correct answer regarding it.



a)

A	B	C	D
Terminator	Promoter	Template strand	Coding strand

b)

A	B	C	D
Promoter	Terminator	Coding strand	Template strand

c)

A	B	C	D
Promoter	Terminator	Template strand	Coding strand

d)

A	B	C	D
Terminator	Promoter	Coding strand	Template strand

132. In negative operon _____
a) co-repressor binds with repressor b) co-repressor does not bind with repressor
c) co-repressor binds with inducer d) CAMP have negative effect on lac operon

133. The enzyme which has polymerising activity in 5'⟶3' direction but exonuclease activity in 3'⟶5' direction only is
a) DNA polymerase III b) DNA polymerase II c) DNA polymerase I d) Both (1) & (2)

134. Male cat is either black or orange because of
a) Hemizygous-X b) Heterozygous-x c) Heterozygous-y d) Hemizygous-Y

135. Wilkins X- ray diffraction showed the diameter the DNA helix is-
a) 10Å b) 20Å c) 30Å d) 40Å

136. Which of the following nitrogen base is not found in DNA-
a) Thymine b) Cytosine c) Guanine d) Uracil

137. If 120 Plants are produced on crossing pure red and pure white flowered pea plants, than the ratio of off springs will be
a) 90 Red : 30 White b) 30 Red : 90 White c) 60 Red : 60 White d) All Red

138. Functioning of structural genes is controlled by
a) Operator b) Promoter c) Ligase d) Regulator gene

139. A and B genes are linked, what shall be genotype of progeny in a cross between AB/ab and aabb:
a) AAbb and aabb b) AaBb and aabb c) AABB and aabb d) None

140. During transcription, RNA polymerase holoenzyme binds to a gene promoter and assumes a saddle - like structure, what is it's DNA-binding sequence?
a) AATT b) CACC c) TATA d) TTAA

141. In most of the plant viruses genetic material is
a) ssDNA b) ssRNA c) dsRNA d) ssRNA + ssDNA

142. During transcription, the DNA site at which RNA polymerase binds is called_____ .
a) enhancer b) Promoter c) regulator d) receptor

143. What occurs in point mutaion?
a) Change in single base pair in DNA b) Change in single base pair in RNA
c) Change in double base pair in DNA d) Change in double base pair in RNA

144. DNA replication is_____
a) conservative and discontinuous b) semi-conservative and semidiscontinuous
c) semi-conservative and discontinuous d) conservative

145. Which are the commonly used vectors for human genome sequencing?

a) BAC and YAC b) Expression vectors c) T-DNA d) T/Acloning vectors

146. In a DNA percentage of thymine is 20% then what will be the percentage of guanine?
a) 20% b) 40% c) 30% d) 60%

147. Reverse transcriptase is_____
a) RNA dependent RNA polymerase b) DNA dependent RNA polymerase
c) DNA dependent DNA polymerase d) RNA dependent DNA polymerase

148. A complex of ribosomes attached to a single strand of RNA is known
a) Okazaki fragment b) polysome c) Polymer d) Polypeptide

149. Match column I with column II and select the correct option from the given codes.

	Column I		**Column II**
A.	UUU	(i)	Serine
B.	GGG	(ii)	Methionine
C.	UCU	(iii)	Phenylalanine
D.	CCC	(iv)	Glycine
E.	AUG	(v)	Proline

a) A-(iii), B-(iv), C-(i), D-(v). E-(ii) b) A-(iii), B-(i), C(iv), D-(v). E-(ii)
c) A-(iii), B-(iv), C-(v), D-(i), E-(ii) d) A-(ii), B-(iv), C-(i), D-(v), E-(iii)

150. Given below is a sample of a portion of DNA strand. What is so special shown in it?
s'-GAAITC-3'
3'-CTTAAG-5"
a) Replication completed b) Deletion mutation c) Start codon at the 5' end
d) Palindromic sequence of base pairs

151. PCR and Restriction Fragment Length Polymorphism are the methods for
a) DNA sequencing b) Genetic fingerprinting c) Study of enzymes
d) Genetic transformation

152. Haemophilic gene does not transfer from:
a) Haemophilic father to son b) Haemophilic mother to son
c) Haemophilic father to daughter d) Haemophilic mother to son & daughter

153. Which of the following is commonly used as a vector for introducing a DNA fragment in human lymphocytes?
a) X phage b) 77 -plasmid c) Retrovirus d) pBR 322

154. The basis for DNA fingerprinting is_____
a) occurrence of Restriction Fragment Length Polymorphism(RFLP)
b) phenotypic differences between individuals c) availability of cloned DNA
d) knowledge of human karyotype

155. During expression of an operon, RNA polymerase binds to
a) structural gene b) regulator gene c) operator d) promoter.

156. In a DNA strand the nucleotides are linked together by
a) glycosidic bonds b) phosphodiester bonds c) peptide bonds d) hydrogen bonds.

157. In split genes, the coding sequence are called_____
a) introns b) operons c) exons d) cistrons

158. The linkage map of X-chromosome of fruitfly 66units, with yellow body gene (y) at one end bobbed hair (b) gene at the other end. recombination frequency between these two get (y and b) should be:
a) 60% b) >50% c) ≤50% d) 100%

159. Some amino acids are coded by more than one codon, hence the genetic code is:
a) overlapping b) degenerate c) wobbled d) unambiguous.

160. Select the incorrect statement from the following
a) Baldness is a sex- limited trait
b) Linkage is an exception to the principle of independent assortment in heredity
c) Galactosemia is an inborn error of metabolism
d) Small population size results in random genetic drift in a population

161. Multiplication of DNA is called
a) Transcription b) Replication c) Translation d) Transduction

162. The genotype of a plant showing the dominant phenotype and can be determined by
a) Pedigree analysis b) Back Cross c) Test cross d) Dihybrid cross

163. In his classic experiments on pea plants, Mend did not use:
a) Flower position b) Seed colour c) Pod length d) Seed shape

164. Unidirectional flow of information is called central dogma, given by
a) F.H.C. Crick b) Temin c) Baltimore d) Dulbecco

165. Which enzymes will be produced in a cell in which there is a nonsense mutation in the lac Y gene?
a) Laotose permease b) Transacetylase c) Lactose permease and transcetylase
d) b- galactosidase

166. On which plant Mendel had carried out his investigations
a) Garden-pea b) Wild pea c) Cow-pea d) Pigeon pea

167. Which RNA carries the amino acids from the amino acid pool to mRNA during protein synthesis?
a) rRNA b) mRNA c) tRNA d) hnRNA

168. An enzyme that joins the ends of two strands of nucleic acid is a____
a) polymerase b) synthetase c) helicase d) ligase

169. Select the correct option that correctly fill the blanks i - iv.
I. less than___(i)___of genome represents structural genes that code for proteins.
II. Chemical substance that binds with repressor and convert it into a non-DNA binding state is___(ii)___
III. In prokaryotes, during replication RNA primer is removed by___(iii)___whereas in eukaryotes it is removed by___(iv)___.

a)

(i)	(ii)	(iii)	(iv)
5%	regulator	DNA polymerase II	DNA polymerase-β

b)

(i)	(ii)	(iii)	(iv)
10%	regulator	DNA polymerase I	DNA polymerase-α

c)

(i)	(ii)	(iii)	(iv)
2%	inducer	DNA polymerase I	DNA polymerase-β

d)

(i)	(ii)	(iii)	(iv)
50%	inducer	DNA polymerase II	DNA polymerase-α

170. Transfonning principle explains
a) Certain rules for growth culture of bacteria b) Ingredients of culture medium
c) Chemical substance released by S type d) Chemical substance released by R type

171. Due to discovery of which of the following in 1980 the evolution was termed as RNA world?
a) mRNA, tRNA, rRNA synthesise proteins b) In some virus RNA is genetic material
c) RNA have enzymatic Property d) RNA is not found in all cells

172. DNA fingerprinting refers to
a) Techniques used for identification of fingerprints of individuals
b) Molecular analysis of profiles of DNA samples
c) Analysis of DNA samples using imprinting devices
d) Techniques used for molecular analysis of different specimens of DNA

173. t-RNA attaches, amino acid at its:
a) 3' end b) 5' end c) Anticodon d) Loop

174. Select the incorrectly matched pair:
a) Initiation codons - AUG, GUG b) Stop codons - UAA, UAG, UGA c) Methionine - AUG
d) Anticodons - mRNA

175. Match the following genes of the Lac operon with their respective products:
(a) i gene - (i) $\beta\beta-$ galactosidase
(b) z gene - (ii) Permease
(c) a gene - (iii) Repressor
(d) y gene - (iv) Transacctylase
Select the correct option.
a) (iii) (i) (ii) (iv) b) (iii) (i) (iv) (ii) c) (iii) (iv) (i) (ii) d) (i) (iii) (ii) (iv)

176. Which of the following phenomena was experimentally proved by Meselson and Stahl?
a) Transformation b) Transduction c) Semi-conservative DNA replication
d) Central dogma

177. A gene showing codominance has:
a) both alleles independently expressed in the heterozygote
b) one allele dominant on the other c) alleles tightly linked on the same chromosome
d) alleles that are recessive to each other

178. Messenger RNA is produced in
a) Nucleus b) Golgi apparatus c) Endoplasmic reticulum d) Ribosomes

179. Watson and Crick (1953) proposed DNA double helix model and won the Nobel Prize; their model of DNA was based on
(i) X-ray diffraction studies of DNA done by Wilkins and Franklin
(ii) Chargaff's base equivalence rule
(iii) Griffith's transformation experiment
(iv) Meselson and Stahl's experiment.
a) (i), (ii) and (iv) b) (i) and (ii) c) (iii) and (iv) d) (i), (ii), (iii) and (iv)

180. What is the inheritance of colour blindness of both parents having a normal vision but mother has a recessive gene for colour blindness

a)

Son	Daughter
50%	Nil

b)

Son	Daughter
100%	Nil

c)

Son	Daughter
Nil	100%

d)

Son	Daughter
Nil	Nil

181. The three codons which result in the termination of polypeptide chain synthesis are
a) UAA, UAG, GUA b) UAA, UAG, UGA c) UAA, UGA, UUA d) UGU, UAG, UGA.

182. The mechanism that causes a gene to move from one linkage group to another is called
a) Translocation b) Crossing-over c) Inversion d) Duplication

183. Which one of the following is not a part of a transcription unit in DNA?
a) The inducer b) A terminator c) A promoter d) The structural gene

184. **Assertion:** When the DNA sequences of two people are cut using the same restriction enzyme, the length and number of fragments obtained are different for both.
Reason: DNA sequence is arranged tandemly in many copy numbers which varies from chromosome to chromosome in an individual, showing high degree of polymorphism.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reasonare true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reasonare false

185. An immature stop codon leads to :
a) Mutation b) Non-sense mutation c) Variation d) Intron

186. Find out the wrong statement about heterochromatin.
a) It is densely packed b) It stains dark. c) It is transcriptionally active
d) It is late replicating.

187. Both deoxyribose and ribose belong to a class of sugars called
a) trioses b) hexoses c) pentoses d) polysaccharides.

188. During translation, activated amino acids get linked to tRNA. This process is commonly called as
a) charging of tRNA b) discharging of tRNA c) aminoacylation of tRNA
d) both (a) and (c).

189. Long lived RNA is:
a) rRNA b) mRNA c) tRNA d) hnRNA

190. Which one of the following conditions of zygotic cell would lead to the birth of a normal human female child?

a) One X and one Y chromosome b) Two X chromosome c) Two X chromosome
d) Only one X chromosome

191. Regulation of gene expression occurs at the level of:
a) transcription b) processing/splicing c) translation d) all of these.

192. During replication of a bacterial chromosome DNA synthesis starts from a replication origin site and_____
a) RNA primers are involved b) is facilitated by telomerase
c) moves in one direction of the site d) moves in bi-directional way

193. A single recessive trait which can express its effect should occur on
a) Any autosome b) Any-chromosome c) X-chromosome of female
d) X-chromosome of male

194. Father of DNA finger printing is
a) Alec Jeffreys b) Lalji Singh c) V.K. Kashyap d) E.M. Southern

195. The number of base substitution possible in amino acid codons is____
a) 261 b) 264 c) 535 d) 549

196. Taylor conducted the experiments to prove semiconservative mode of chromosome replication on :
a) Vicia aba b) Drosophila melanogaster c) E. coli d) Vinca rosea

197. Which of the following may be true for RNA
a) A = U G = C b) A ≠ U G ≠ C c) A = U = G = C d) Purines = Pyrimidines

198. Amino acids which are specified by single codons are:
a) phenylalanine and arginine b) tryptophan and methionine c) valine and proline
d) methionine and arginine

199. Which of the following pairs is incorrectly matched?
a) Purines - Adenine and Guanine b) Pyrimidines - Cytosine and Uracil
c) Nucleosides - Adenosine and Thymidine d) DNA - Basic biomolecule

200. The sequence of structural genes in lac operon is:
a) Lac A, Lac Y, Lac Z b) Lac A, Lac Z, Lac Y c) Lac Y, Lac Z, Lac A
d) Lac Z, Lac Y, Lac A

201. The translation termination triplet is_____
a) UAU b) UAA c) UAC d) UGC

202. Haploids are more suitable for mutation studies than the diploids. This is because:
a) haploids are more abundant in nature than diploids
b) All mutations, whether dominant or recessive are expressed in haploids
c) Haploids are reproductively more stable than diploids
d) Mutagens penetrate in haploids more effectively than in diploids

203. DNA is a polymer of nucleotides which are linked to each other by 3' -5' phosphodiester bond. To prevent polymerisation of nucleotides, which of the following modifications would you choose?

a) Replace purines with pyrimidines. b) Remove/Replace 3' OH group in deoxyribose
c) Remove/Replace 2' OH group with some other group in deoxyribose d) Both (b) and (c).

204. RNA is the genetic material in
a) prokaryotes b) eukaryotes c) Tobacco Mosaic Virus (TMV) d) E. coli.

205. If there are 999 bases in an RNA that codes for a protein with 33 amino acids, and the base at position 901 is deleted such that the length of the RNA becomes 998 bases, how many codons will be altered?
a) 1 b) 11 c) 33 d) 333

206. A human male produces sperms with the genotypes AB, Ab, aB and ab, in equal proportions. What is the corresponding genotype of this person:
a) AaBb b) AaBB c) AABb d) AABB

207. DNA precipitation out of a mixture of biomolecules can be achieved by treatment with_____
a) Chilled ethanol b) Methanol at room temperature c) Chilled chloroform
d) Isopropanol

208. The number of N-glycosidic linkage in ϕ174 virus is
a) 5386 b) 5385 c) 48502 d) 10772

209. Commonly used vectors for human genome sequencing are
a) T-DNA b) BAC and YAC c) Expression Vectors d) T/A Cloning Vectors

210. Sex-linked disorders are generally
a) Lethal b) Recessive c) Dominant d) Not inherited

211. Which one is not applicable to RNA?
a) Complementary base pairing b) 5'phosphoryl and 3' hydroxyl ends
c) Heterocyclic nitrogenous bases d) Chargaff's rule

212. Amino acid acceptor end of tRNA lies at
a) 5' end b) 3' end c) T Ψ C loop d) DHU loop.

213. There will be no Barr body in female suffering from:
a) Turner syndrome b) Kleinfelter syndrome c) Down syndrome d) Haemophilia

214. Genes do not occur in pairs in
a) Zygote b) Somatic cell c) Endosperm cell d) Gametes

215. Which chromosome set is found in male hopper
a) 2A+XY b) 2A+XO c) 2A+YY d) 2A+XX

216. The methodologies used for the sequencing of whole set of genome containing all the coding and non-coding sequence is
a) ESTs b) SNPs c) Sequence annotation d) DNA profiling

217. During DNA replication, the strands separate by_____
a) DNA polymerase b) topoisomerase c) unwindase/helicass d) gyrase

218. In Hardy- Weinberg equation, the frequency of heterozygous individual is represented by:
a) pq b) q^2 c) P^2 d) 2pq

219. Expressed Sequence Tags (ESTs) refers to_____

a) Polypeptide expression b) Dive pulymirphism c) Novel DNA sequences
d) Genes expressed as RNA

220. If two persons with 'AB' blood group marry and have sufficiently large number of children, these children could be classified as 'A' blood group: 'AB' blood group 'B' blood group in 1:2:1 ratio. Modern technique of protein electrophoresis reveals presence of both 'A' and 'B' type proteins in 'AB' blood group individuals. This is an example of:
a) Complete dominance b) Codominance c) Incomplete dominance
d) Partial dominance

221. Which of the following is not a stop codon?
a) UGA b) UAG c) AUG d) UAA

222. **Assertion :** Template or antisense strand, having 3' ~ 5' polarity takes part in transcription.
Reason: Non-template or sense strand, having 5' ~ 3' polarity, does not take part in transcription.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reasonare true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reasonare false

223. The first amino acid in any polypeptide chain of prokaryote is always
a) Formylated methionine b) Formylated arginine c) Lysine d) Methionine

224. One turn of the helix in a B-form DNA is approximately
a) 20nm b) 0.34nm c) 3.4nm d) 2nm

225. A colourblind daughter is born when
a) Father is colourblind, mother is normal b) Mother is coloublind, father is normal
c) Mother is carrier, father is normal d) Mother is carrier, father is colourblind

226. Nucleotide arrangement in DNA can be seen by____
a) X-ray crystallography b) electron microscope c) ultracentrifuge d) light microscope

227. Antiparallel strand in DNA is due to
a) Disulphide linkage b) Hydrogen bond c) Phosphodiester bond d) Ionic bond

228. In a DNA molecule, the phosphate group is attached to carbon _____ of the sugar residue of its own nucleotide and carbon _____ of the sugar residue of the next nucleotide by _____ bonds.
a) 5', 3', phosphodiester b) 3', 5', phosphodiester c) 5', 3', glycosidic d) 3', 5', glycosidic

229. The amino acid attaches to the tRNA at its
a) 5' - end b) 3' - end c) anticodon site d) DHU loop.

230. Which one of the following makes use of RNA as a template to synthesize DNA?
a) DNA polymerase b) RNA polymerase c) Reverse transcriptase
d) DNA dependant RNA polymerase

231. Estimated number of genes in human beings is
a) 3,000 b) 80,000 c) 20,500 d) 3×10^9

232. Which one of the following is a case of wrong matching?

a) Micropropagation-In vitro production of plants in large numbers

b) Callus - Unorganised mass of cells produced in tissue culture

c) Somatic hybridization - Fusion of two diverse cells

d) Vector DNA - Site for t-RNA synthesis

233. Which one among the following was the first genetic material?
a) DNA b) RNA c) Protein d) Nuclein

234. Which form of RNA has a structure resembling clover leaf?
a) rRNA b) hn RNA c) mRNA d) tRNA

235. Cap nucleotIdes at 5' of mRNA consists of
a) m^7G b) m^5C c) Poly A d) CCA

236. When two unrelated individuals or lines are crossed, the performance of F1 hybrid is often superior to both its parents. This phenomenon is called:
a) Heterosis b) Transformation c) Splicing d) Metamorphosis

237. Sickle cell anemia results from a single base substitution in a gene, thus it is an example of
a) point mutation b) frame-shift mutation c) silent mutation d) both (a) and (b).

238. The incorrect statement with regard to Haemophilia is
a) A single protein involved in the clotting of blood is affected b) It is a sex-linked disease

c) It is a recessive disease d) It is a dominant disease

239. Refer to the given steps of DNA replication.
(i) Exposure of DNA strands
(ii) Synthesis of RNA primer
(iii) Activation of deoxyribonucleotides
(iv) Chain formation
(v) Base pairing
(vi) Proof reading and DNA repair
(vii) DNA polymerase attaches at Oti site
Select the correct sequence of DNA replication.
a) (vii) ⟶ (iii) ⟶ (i) ⟶ (ii) ⟶ (v) ⟶ (iv) ⟶ (vi)
b) (iii) ⟶ (i) ⟶ (vii) ⟶ (ii) ⟶ (v) ⟶ (iv) ⟶ (vi)
c) (vii) ⟶ (i) ⟶ (iii) ⟶(ii) ⟶ (v) ⟶ (iv) ⟶ (vi)
d) (i) ⟶ (iii) ⟶ (ii) ⟶ (vii) ⟶ (v) ⟶ (iv) ⟶ (vi)

240. In some viruses, DNA is synthesised by using RNA as template. Such a DNA is called
a) A-DNA b) B-DNA c) cDNA d) rDNA.

241. Satellite DNA is useful tool in
a) Forensic science b) Genetic engineering c) Organ transplantation

d) Sex determination

242. The transforming principle of Pneumococcus as found out by Avery, Mac Leod and McCarty was___
a) mRNA b) DNA c) protein d) polysaccharide

243. Refer to the given sequence of steps and select the correct option.

$$DNA \xrightarrow{(i)} hnRNA \xrightarrow{(ii)} mRNA \xrightarrow{(iii)} proteins$$

a)

(i)	(ii)	(iii)
Replication	Transcription	Translation

b)

(i)	(ii)	(iii)
Replication	Processing	Translation

c)

(i)	(ii)	(iii)
Transcription	Splicing	Translation

d)

(i)	(ii)	(iii)
Transcription	Replication	Translation

244. What is not true for genetic code?
a) It is nearly universal b) It is degenerate c) It is unambiguous
d) A codon in mRNA is read in a non contiguous fashion

245. Severo Ochoa enzyme is
a) DNA polymerase b) Guanyl transferase c) Peptidyl transferase
d) Polynucleotide phosphorylase

246. Read the following four statement (A-D):
(A) In transcription, adenosine pairs with uracil.
(B) Regulation of lac operon by repressor is referred to as positive regulation.
(C) The human genome has approximately 50000 genes.
(D) Haemophilia is a sex-linked recessive disease.
How many of the above statements are right?
a) Four b) One c) Two d) Three

247. Which of the following is a stop codon
a) AUG,GUG,UUU b) UGA,UAG,UAA c) UUU,UAC,CUC d) CUC,UAC,UAA

248. Multiple alleles are present:
a) At different loci on the same chromosome b) At the same locus of the chromosome
c) On non-sister chromatids d) On different chromosomes

249. The wild type E. coli cells are growing in normal medium with glucose. They are transferred to a medium containing only lactose as sugar. Which of the following changes takes place?
a) The lac operon is repressed b) All operons are induced c) The lac operon is induced
d) E. coli cells stop dividing

250. Radioactive element used to label DNA of bacteriophage In Hershey and Chase experiment was
a) S^{35} b) P^{32} c) N^{15} d) C^{14}

251. The experimental proof for semi-conservative replication of DNA was first shown in a:
a) Plant b) Bacterium c) Fungus d) Virus

252. A DNA template plus primer with the structure

(where P = a phosphate group) is placed in an in vitro DNA synthesis system containing Mg2+,

an excess of the four deoxyribonucleoside triphosphates, etc. and a mutant form of E. coli DNA polymerase I that lacks 5' ~ 3' exonuclease activity. The 5' ~ 3' polymerase and 3' ~ 5' exonuclease activities of this aberrant enzyme are identical to those of normal E. coli DNA polymerase I. It simply has no 5' ~ 3' exonuclease activity. What will be the structure of the final product?

a) 3′ Ⓟ–TGCGAATTAGCGACAT–Ⓟ 5′
5′ Ⓟ–ATCGGTACGACGCTTAATCGCTGTA–OH 3′

b) 3′ Ⓟ –TGCGAATTGGCGACAT–Ⓟ 5′
5′ Ⓟ –ATCGGTACGACGCTTAACCGCTGTA–OH 3′

c) 3′ HO–TGCGAATTAGCGACAT– Ⓟ 5′
5′ –ATCGGTACGACGCTTAATCGCTGTA – Ⓟ 3′

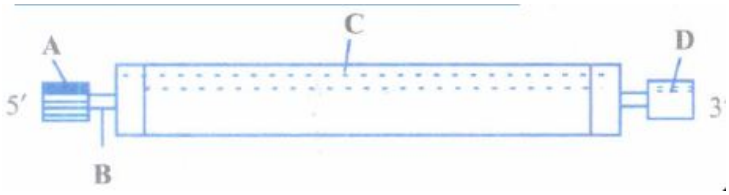
d) 3′ Ⓟ–TGCGAATTAGCGACAT–Ⓟ 5′
5′ Ⓟ –ACGCTTAATCGCTGTA–OH 3′

253. The term "linkage" was coined by:
a) W.Sutton b) T.H.Morgan c) T.Boveri d) G.Mendel

254. A molecule that can act as a genetic material must fulfill the traits given below, except:
a) It should be able to generate its replica
b) It should be unstable structurally and chemically
c) It should provide the scope for slow changes that are required for evolution
d) It should be able to express itself in the form of Mendelian characters

255. What would happen if in a gene encoding a polypeptide of 50 amino acids, 25th codon (UAU) is mutated to UAA?
a) A polypeptide of 24 amino acids will be formed.
b) Two polypeptides of 24 and 25 amino acids will be formed.
c) A polypeptide of 49 amino acids will be formed.
d) A polypeptide of 25 amino acids will be formed.

256. Identify A, B, C and D in the given diagram of mRNA.



a)

A	B	C	D
Methylated cap	Initiation codon	Termination codon	PolyA tail

b)

A	B	C	D
PolyA tail	Termination codon	Initiation codon	Methylated cap

c)

A	B	C	D
Methylated cap	Non-coding region	coding region	PolyA tail

d)

A	B	C	D
Methylated cap	coding region	Non-coding region	PolyA tail

257. Alleles are
a) true breeding homozygotes b) different molecular forms of a gene c) heterozygotes
d) different phenotype

258. Which of the following is called adaptar molecule-

a) DNA b) m-RNA c) t-RNA d) RNA

259. Which one of the following is a wrong statement regarding mutations?
a) UV and Gamma rays are mutagens
b) Change in a single base pair of DNA does not cause mutation
c) Deletion and insertion of base pairs cause frameshift mutations
d) Cancer cells commonly show chromosomal aberrations

260. Name the enzyme that facilitates opening of DNA helix during transcription_____ .
a) DNA polymerase b) RNA polymerase c) DNA ligase d) DNA helicase

261. Find incorrect match.
a) RNA polymerase - Attach to UTR b) ρ (rho) factor - Termination
c) Core enzyme - $\alpha_2\beta\beta'\omega$ d) Promoter site - Sigma factor

262. Protein helping in opening of DNA double helix in front of replications fork is____
a) DNA gyrase b) DNA polymerase-I c) DNA ligase d) topoisomeras

263. The human chromosome with the highest and least number of genes in them are respectively
a) chromosome 21 and Y b) chromosome 1 and X c) chromosome 1 and Y
d) chromosome X and Y.

264. If there are 10,000 base pairs in DNA, then its length
a) 340nm b) 3400nm c) 34000nm d) 340000nm

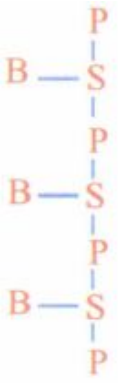
265. Kornberg enzyme is known as
a) DNA polymerase I b) DNA polymerase II c) DNA polymerase III d) RNA polymerase

266. The codons causing chain termination are_____ .
a) TAG, TAA, TGA b) GAT, AAT, AGT c) AGT, TAG, UGA d) UAA, UAG, UGA

267. In Mendel's experiments with garden pea, round seed shape (RR) was dominant over wrinkled seeds (rr), yellow catyledon (YY) was dominant over green cotyledon (yy) was dominant over green catyledon (yy). What are the expected phenotypes in the F2 generation of the cross RRYY xrryy?
a) Only round seeds with green cotyledons b) Only wrinkled seeds with yellow cotyledons
c) Only wrinkled seeds with greencotyledons
d) Round seeds with yellow cotyledons, and wrinkled seeds with yellow cotyledons

268. Phenotype of an organism is the result of-
a) Mutations and linkages b) Cytoplasmic effects and nutrition
c) Environmental changes and sexual dimorphism
d) Genotype and environment interaction

269. Which of the following shows the correct positions of the phosphate (P), sugar (S) and base (B) molecules in the given line diagrams representing the structure of DNA?

a) 

b) 

c) 

d) 

270. A parent having autosomal dominant disease then what will be the probability of diseased offspring (irrespective of sex of the chlid):
a) 90% b) 10% c) 75% d) 100%

271. Types of RNA polymerase required in nucleus for RNA synthesis?
a) 1 b) 2 c) 3 d) 4

272. If a double stranded DNA has 20% of cytosine, what will be the percentage of adenine in it?
a) 20% b) 40% c) 30% d) 60%

273. Read the following statements and select the correct option.
(i) Loosely packed and lightly stained region of chromatin are called as heterochromatin.
(ii) Densely packed and dark stained region of chromatin are called as euchromatin.
(iii) A typical nucleosome contains 200 bp of DNA hehx.
a) Statements (i) and (ii) are true, but statement (iii) is false.
b) Statements (i) and (ii) are false, but statement (iii) is true.
c) Statements (ii) and (iii) are true, but statement (i) is false. d) All the statements are true

274. In which of the following hn RNA is formed?
a) Nostoc b) Rhizobium c) Chlamydomonas d) Mycoplasma

275. What is the first step in the Southern Blot technique
a) Denaturation of DNA on the gel for hybridization with specific probe
b) Production of a group of genetically identical cells
c) Digestion of DNA by restriction enzyme
d) Isolation of DNA from a nucleated cell such as the one from the scene of crime

276. Dihybrid plants from how many types of pollen grains
a) One b) Two c) Four d) Eight

277. **Assertion :** Repetitive sequences make up very large portion of human genome.
Reason : Repetitive sequences do not have direct coding functions in the genome.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reasonare true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reasonare false

278. In one polynucleotide strand of a DNA molecule the ratio of A + T/G + C is 0.3. What is the A + GIT + C ratio of the entire DNA molecule?
a) 0.3 b) 0.6 c) 1.2 d) 1

279. Match column I with column II and select the correct option from the given codes

	Column I		Column II
A.	F.Meischer	(i)	DNA double helix
B.	Griffith	(ii)	Nuclein
C.	Hershey and Chase	(iii)	S. pneumoniae
D.	Watson and Crick	(iv)	Bacteriophages
E.	Wilkins and Franklin	(v)	X-ray diffraction studies

a) A-(ii), B-(iii), C-(iv), D-(i), E-(v) b) A-(v), B (iv), C-(iii), D-(i), E-(ii)
c) A-(i), B-(iii), C-(iv), D-(ii), E-(v) d) A-(i), B-(iv), C-(iii), D-(ii), E-(v)

280. If a colourblind women marries a normal visioned man, their sons will be-
a) All normal visioned b) One-half colourblind and one-half normal
c) Three-fourths colourblind and one- fourth normal d) All colourblind

281. Khorana first deciphered the triplet codons of_____
a) serine and isoleucine b) threonine and histidine c) tyrosine and tryptophan
d) phenylalanine and methionine

282. Which of the following statements regarding 'human genome' is incorrect?
a) Human genome consists of 3 x 10^9 bp and about 20,500 genes.
b) The average gene size is 3000 bp and dystrophin is the largest known human gene.
c)
Chromosome 1 contains maximum (2968) number of genes and V-chromosome has the least (231) number of genes
d) Repeated (or repetitive) sequences are not present in human genome.

283. Which of the following is involved in translation:
a) DNA b) mRNA,tRNA,DNA c) mRNA,tRNA d) Only mRNA

284. If a colour-blind man marries a woman who is homozygous for normal colour vision, the probability of their son being colour-blind is :
a) 0.75 b) 1 c) 0 d) 0.5

285. Genetic code consists of_____
a) adenine and guanine b) cytosine and uracil c) cytosine and guanine
d) All of the above

286. Which of the following criteria should be fulfilled by a molecule to act as a genetic material?
(i) It should be able to replicate.
(ii) It should be structurally and chemically stable.
(iii) It should be able to undergo slow mutations.
(iv) It should be able to express itself in the form of 'Mendelian characters'.
a) (i) and (ii) b) (ii) and (iii) c) (i), (ii) and (iii) d) (i), (ii), (iii) and (iv)

287. **Assertion:** In Griffith's experiment, a mixture of heat- killed virulent bacteria R and live non-virulent bacteria S, lead to the death of mice.
Reason: 'Transforming principle' got transferred from heat-killed R strain to S strain and made it virulent.
a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reasonare true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false. d) If both assertion and reasonare false

288. The Pneumococurs experiment proves that_____
a) DNA is the genetic material
b) RNA sometime controls the production of DNA and proteins
c) bacteria undergo binary fission d) bacteria do not reproduce sexually

289. Choose the correct one w.r.t. DNA replication
a) Fast b) Energy expensive c) Accurate d) More than one option is correct

290. Two allelic genes are located on:
a) The same chromosome b) Two homologous chromosomes
c) Two-non-homologous chromosomes d) Any chromosomes

291. Bonding between deoxyribose' and base in purine nucleoside molecule Is
a) H-bonding b) Phosphoester linkage c) Glycosidic linkage d) Phosphodlester linkage

292. Gene and cistron words are sometimes used synonymously because____
a) one cistron contains many genes b) one gene contains many cistrons
c) one gene contains one cistron d) one gene contains no cistron

293. Match column I with column II and select the correct option from the given codes.

	Column I		**Column II**
A.	Griffith	(i)	Lac operon
B.	Hershey and Chase	(ii)	Semi-conservative DNA replication
C.	Meselson and Stahl	(iii)	Transduction
D.	Jacob and Monod	(iv)	Transformation

a) A-(iv), B-(iii). C-(ii), D-(i) b) A-(iii), B-(iv), C-(ii), D-(i) c) A-(iv), B-(ii), C-(iii), D-(i)
d) A-(ii), B-(i), C-(iii), D-(iv)

294. Genotype is
a) Genetic composition of many organisms b) Genetic composition of plastids
c) Genetic composition of germ cells only d) Genetic composition of an individual

295. Experimental material used in transformation experiment was
a) Bacillus b) Bacteriophage c) Diplococcus d) E.coil

296. In E. coli, the lac operon gets switched on when
a) lactose is present and it binds to the repressor b) repressor binds to operator
c) RNA polymerase binds to the operator
d) lactose is present and it binds to RNA polymerase

297. In which direction m-RNA is synthesised on DNA template?
a) 5'$\rightarrow$3' b) 3'$\rightarrow$5' c) Both (a) and (b) d) Any

298. Heterozygous tall plants were crossed with dwarf plants. what will be the ratio of dwarf plants in the progeny:
a) 50% b) 25% c) 75% d) 100%

299. Genes are packaged into a bacterial chromosome by_____
a) histones b) basic protein c) acidic protein d) actin

300. In DNA when AGCT occurs, their association is as per which of the following pair?

a) ACGT b) AGCT c) ATGC d) All of these