BIOLOGY

BOOKS - GR BATHLA & SONS BIOLOGY (HINGLISH)

THE GENETIC MATERIAL

Multiple Choice Questions

1. Nucleic acids were discorvered by :

A. M.H.F. Wilkins

B. Watson and Crick

C. Friedrich Miescher

D. Har Govind Khorana

Answer: C

2. Who introduced the term 'nucleic acid ?

A. Francis Crick

B. R. Altmann

C. Robert Brown

D. Arthur Kornberg

Answer: B

3. Cell division requires that the genetic material be able to :

A. be replicated

B. undergo rare mutations

C. store information

D. all of these

Answer: A

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Dna

1. Characters are transferred from parents to offspring through :

A. RNA

B. DNA

C. Lipid

D. Protein

Answer: B

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2. Transfer of genetic information from one generation to the other is accomplished by :

A. DNA

B. Triplet codon

C. Transfer RNA

D. Messenger RNA

Answer: A

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3. DNA is present in :

A. nucleus only

B. chloroplast only

C. mitochondrion only

D. all of these

Answer: D

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4. Which of the following processes results in a change of the cellular amount of DNA ?

A. Blastulation

B. Fertilization

C. Cytokinesis

D. Spore formation

Answer: B

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5. The amount of DNA in a diploid cell is :

A. variable for a give species

B. same in all species of plants

C. constant fro a given species

D. same in all species of animals

Answer: C

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6. Through which experiments, the first proof that DNA is the genetic material was provided ?

A. Transfection

B. Phage infection

C. Bacterial translocation

D. Bacterial transformation

Answer: D

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7. The genetic trnsformation experiments on Diplococcus pneumoniae gave first undoubted evidence that :

A. DNA is the genetic material

B. DNA is made of nucleotides

C. Chromosomes are made of DNA

D. RNA is synthesized on a DNA template

Answer: A

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8. Who performed the transformation experiments in bacteria ?

A. Louis Pasteur

B. Frederick Griffith

C. Colin M. MacLeod

D. Meselson and Stahl

Answer: B

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9. The bacterium used in Griffith's experiment was :

A. Bacillus

B. Spirillum

C. Monococcus

D. streptococcus

Answer: D

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10. Transformation experiment was first performed on :

A. Escherichia coli

B. Salmonella typhi

C. Pasteurella pestis

D. streptococcus pneumoniae

Answer: D

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11. Which of the following pairs is correctly matched ?

A. Linus Paulind - Isolated DNA for the fist time

B. Francis Crick - Proposed one one polypeptide hypothesis

C. George Beadle - Proposed the concept of inborn errors

D. Frederick Griffith - Discovered the pheonomenon of transformation

Answer: D

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12. What happed when heat killed S cells along with live R cells were injected into mice ?

A. Mice died and showed live R cells

B. Mice died and showed live S cells

C. Mice died and showed dead R cells

D. Mice survived and showed live S cells

Answer: B

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13. A mixture of heat- killed NL-cells (dead cells) and live L- cells is injected into mice. NL- type cells are pathogenic, develop a disease and kill the animals. On the other hand L- type cells are nonpathogenic. The expected results could be :

A. mice develop disease and die

B. $50\ \%$ mice develop disease and die

C. mice die without developing disease

D. all mice remain healthy but lose vision

Answer: A

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14. The transforming principle of Griffith's experiment was DNA. A very, MacLeod and McCarty was :

A. DNA

B. protein

C. m-RNA

D. polysaccharide

Answer: A

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15. Transforming principle in Griffith's experiment was DNA. It was discovered by :

A. Zinder and Tatum

B. Zinder and Lederberg

C. Lederberg and Tatum

D. A very, MacLeod and McCarty

Answer: D

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16. Transformation efficiency of bacteria (as in the experiment of Avery et al.) would be drastically reduced if the tranforming material is treated with :

A. lipase

B. ribonuclease

C. protease

D. deoxyribonuclease

Answer: D

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17. Avery et al. used :

A. Dnase

B. Rnase

C. Protease

D. All of these

Answer: D

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18. Who proved that DNA is the basic genetic material

?

A. James Watson

B. Frederick Griffith

C. Hershey and Chase

D. Sutton and Boveri

Answer: C

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19. The first every experiment evidence showing DNA as genetic material in bacteriophages came from the studies of :

A. Weismann

B. Beadle and Tatum

C. Hershey and Chase

D. Schleiden and Schwann

Answer: C

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20. Heshey and Chase demonstrated that DNA and not protein is the genetic material with the help of the radioactive isotopes :

A. . ^{59} Iron and . ^{15} Nitrogen

B. . ^{131} Iodine and . ^{45} Calcium

C. $._{}^{15}$ Nitrogen and $._{}^{14}$ Carbon

D. $._{}^{35}$ Sulphur and $._{}^{32}$ Phosphorus

Answer: D

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21. A radioactive isotope used to label DNA differentially from protein is :

A. $._{}^{32}$ P

B. $._{}^{14}$ C`

C. $._{}^{35}$ S

D. . ^{15} N

Answer: A

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22. Blender experiments conducted by Hershey and Chase demonstrated that DNA is genetic material in :

A. Escherichia coli

B. T_2 bacteriophage

C. Tobacco mosaic virus

D. Diplococcus pneumoniae

Answer: B

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23. A bacteriophage with radioactive DNA and protein when infects a bacterium the radioactivity inside the bacterium will be located in :

A. DNA

B. protein

C. Both DNA and protein

D. All parts of bacteria cell

Answer: A

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24. Prokaryotic genetic material possesses :

A. DNA but no histones

B. Either DNA or histones

C. Both DNA and histones

D. Neither DNA nor histones

Answer: A

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25. The proteins associated with nucleic acids are :

A. albumins

B. histones

C. globulins

D. lipoproteins

Answer: B

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26. Prokaryotic DNA is :

A. single stranded straight

B. single stranded circular

C. double stranded straight

D. double stranded circular

Answer: D

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27. Which type of DNA is found in bacteria ?

A. Helical DNA

B. Straight DNA

C. Circular free DNA

D. Membrane bound DNA

Answer: C

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28. Circular DNA molecules occur in :

A. viruses

B. bacteria only

C. bacteria and chloroplasts only

D. bacteria, chloroplasts and mitochondria

Answer: D

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29. The hereditary material (DNA) present in the bacterium E.coli is :

A. single stranded straight

B. single stranded circular

C. double stranded straight

D. double stranded circular

Answer: D

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30. The eukaryotic genome differs from the prokaryotic genome because :

A. repetitive sequence are present in eukaryotes

B. the DNA is complexed with histones in prokaryotes

C. genes in the former case are organised into operons

D. the DNA is circular and single stranded in prokaryotes

Answer: A

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31. Supercoiled DNA can be traced in :

A. prokaryotes and eukaryotes

B. eukaryotes only

C. prokaryotes only

D. none of the above

Answer: A

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32. Which suger is present in nucleic acid ?

A. Hexose

B. Glucose

C. Pentose

D. Fructose

Answer: C

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33. Pentose sugar in nucleic acid was discovered by

A. Kossel

B. Fischer

C. Levene

D. Chargaff

Answer: C

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34. Which of the following sugar is found in nucleic acid ?

A. Glucose

B. Dextrose

C. Levolose

D. Deoxyribose

Answer: D

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35. The sugar in DNA is :

A. $2'-$ deoxyribose

B. $4'-$ deoxyribose

C. $3'-$ deoxyribose

D. $5' -$ deoxyribose

Answer: A

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36. Number of carbon in ring of deoxyribose sugar is :

A. six

B. four

C. five

D. three

Answer: C

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37. Phosphorus is present in :

A. DNA

B. RNA

C. Protein

D. Both DNA and RNA

Answer: D

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38. Adenosine is :

A. purine

B. pyrimidine

C. nucleoside

D. nucleotide

Answer: C

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39. A nucleoside is :

A. sugar + phosphate

B. purine / pyrimidine + sugar

C. purine / pyrimidine + sugar

D. purine / pyrimidine + phosphate

Answer: B

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40. A nucleoside differs from a nucleotide is not having :

A. sugar

B. phosphate

C. nitrogen base

D. phosphate and sugar

Answer: B

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41. In the carbon skeleton of the pentose sugar in DNA, what is the attachment point of a base to form a nucleoside ?

A. C_3

B. C_2

C. C_1

D. C_4

Answer: C

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42. What is the common point of similarity between DNA and RNA ?

A. Both are double stranded

B. Both are polymers of nucleotides

C. Both have identical sugar molecules

D. Both have identical pyrimidine bases

Answer: B

43. Genetic informatiosn are carried in form of long chain of molecules made of :

A. RNA

B. Nucleotides

C. Amono acids

D. Polypeptides

Answer: B

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44. Adenylic acid is a / an :

A. nucleoside

B. Nucleotides

C. amino acid

D. nitrogen base

Answer: B

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45. Structural unit of DNA is :

A. Nucleotide

B. Nucleoside

C. Nucleosome

D. Polynucleotide

Answer: A

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46. Nucleotides have a sugar consisting of :

A. 3 carbon atoms

B. 2 carbon atoms

C. 6 carbon atoms

D. 5 carbon atoms

Answer: D

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47. What is a nucleotide ?

A. Phosphoric acid

B. Nitrogenous base

C. Sugar + nitrogenous base

D. Sugar + nitrogenous base + phosphoric acid

Answer: D

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48. Nucleotides are building blocks of nucleic acids. Each nucleotide is a composite molecule formed by :

A. base- sugar -OH

B. Sugar -phosphate

C. base-sugar-phosphate

D. (base-sugar-phosphate)n

Answer: C

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49. Similarity between DNA and RNA, both :

A. have similar sugars

B. are genetic materials

C. have similar pyrimidines

D. are polymers of nucleotides

Answer: D

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50. Nucleotides arrangement in DNA can be studied by :

A. Ultracentrifuge

B. Light microscope

C. Electron microscope

D. X- ray crystallography

Answer: D

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51. Nucleotide on hydrolysis does not give :

A. purines

B. amino acids

C. pyrimidines

D. pentose sugar

Answer: B

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52. Condensation product of adenine, ribose and phosphoric acid is named as :

A. adenosine

B. adenylic acid

C. adenine phosphate

D. none of these

Answer: B

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53. A short length of DNA molecule has 80 thymine and 80 guanine bases. The total number of nucleotides in the DNA fragment is :

A. 40

B. 80

C. 160

D. 320

Answer: D

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54. Which of the following is not relevant to the structure of double helical DNA ?

A. The diameter of the helix is 20A

B. The distance between adjacent nucleotide is $3.4A$

C. The helix makes one complete sprial turn every $34A$

D. Each strand of helix has a backbone make up of alternating ribose sugar and phosphate

Answer: D

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55. If a length of DNA has 45,000 base pairs, how many complete turns will the DNA molecule take ?

A. 45

B. 450

C. 4500

D. 45000

Answer: C

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56. Statements :

A. The four nucleotide bases are not necessarily present in DNA in exact equal proportions.

B. The total amount of purines are equal to the toal amount of pyrimidines.

C. DNA ligase enzyme act to hydrolyse or breakdown a polynucleotide chain into its component nucleotides.

D. Nuclease enzymes are capable of restoring an intact DNA duplex.

Of the above statements :

A. A,B and C are correct but D is wrong

B. B,C and D are correct but A is wrong

C. B is correct But A, C and D are wrong.

D. A and B are correct but C and D are wrong.

Answer: D

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57. The successive nucleotides of DNA are covalently linked through :

A. peptide bonds

B. hydrogen bonds

C. glycosidic bonds

D. phosphodiester bonds

Answer: D

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58. The carbon atoms of the pentose sugar involved in phosphodiester bond formation in DNA and RNA are :

A. C_1' and C_5'

B. C_2' and C_3'

C. C_3' and C_5'

D. C_4' and C_5'

Answer: C

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59. In DNA the two chains of double helix run opposite to each other. This head to tail arrangement is called :

A. alternation

B. antiparallelism

C. semiconservatism

D. autoconservatism

Answer: B

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60. The two polynucleotide chains in DNA are :

A. parallel

B. antiparallel

C. discontinuous

D. semiconservative

Answer: B

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61. Antiparallel strands of a DNA molecule means that :

A. one strand turns clockwise

B. one strand turns anti-clockwise

C. the phosphate groups of two DNA strands at their ends, share the same position.

D. the phosphate groups at the start of two. DNA strands are in opposite position (pole)

Answer: D

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62. DNA strands are antiparallel because of the presence of :

A. H-bonds

B. Prptide bonds

C. Disulphide bonds

D. Phosphodiester bonds

Answer: D

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63. A nitrogenous base is linked to the pentose sugar through :

A. peptide bond

B. Hydrogen bond

C. Phosphate diester bond

D. glycosidic bond

Answer: D

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64. Phosphodiester bond is present in :

A. ADP

B. ATP

C. CAMP

D. all of these

Answer: D

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65. In the double -helical structure of DNA, the pitch of the helix is :

A. 3.4 nm

B. 0.34 nm

C. 6.6 nm

D. 34 nm

Answer: A

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66. The four nitrogen base sequence which form the code words for DNA language are :

A. UTAC

B. ACTU

C. ATCG

D. AGCU

Answer: C

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67. The chemical name of cytosine is :

A. 6-amino purine

B. 2-amino-6-oxopurine

C. 4-amino-2-oxopyrimidine

D. 5-methyl-2,4-dioxopyrimidine

Answer: C

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68. Which are purines ?

A. Adenine and guanine

B. Adenine and thymine

C. Cytosine and thymine

D. Cytosine and guanine

Answer: A

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69. Which of the following pairs is not correctly matched ?

A. ATP-The principial energy carrying compound in the cell

B. Purine - Nitrogenous bases cytosine, thymine and uracil

C. r-RNA- RNA molecules found in ribosomes

D. Recombinant-DNA formed by joining of segment DNA of DNA from different sources

Answer: B

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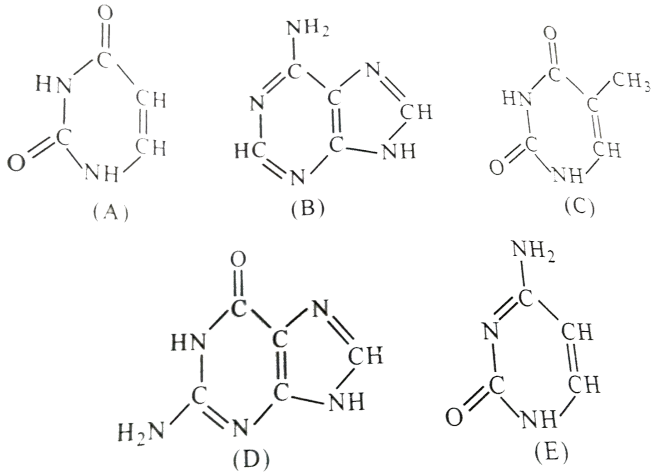
70. The following diagrams represent the nitrogenous bases of nucleic acid molecules. Identify the correct combination :



A. A= uracil, B= guanine, C=cytosine,D=adenine,E=thymine

B. A=thymine,B=adenine,C=cytosine,D=guanine,E=uracil

C. A=uracil,B=adenine,C=thymine,D=guanine,

E=cytosine

D. A=uracil,B=guanine,C=thymine,D=adenine,E=cytosine

Answer: C

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71. In a DNA double helix :

A. the single strands are not helical

B. phosphodiester bonds are oriented towards the interior of the helix

C. adenine on one strand is hydrogen bonded to thymine on the opposite strand.

D. hydrogen bonds form between a purine and pyrimidine base on the same strand.

Answer: C

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72. Select the specific base pairs of DNA :

A. adenine and cytosine

B. guanine and uracil

C. guanine and adenine

D. adenine and thymine

Answer: D

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73. Which base is not found in DNA ?

A. Uracil

B. Adenine and thymine

C. guanine and adenine

D. Cytosine

Answer: A

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74. DNA is not present in :

A. Nucleus

B. Ribosomes

C. Chloroplast

D. Mitochondria

Answer: B

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75. Thymine is :

A. purine

B. enzymes

C. pyrimidine

D. vitamin

Answer: C

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76. Which of the following is not a pyrimidine ?

A. Thymine

B. Uracil

C. guanine and adenine

D. Cytosine

Answer: C

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77. In DNA, guanine pairs with :

A. uracil

B. thymine

C. adenine

D. cytosine

Answer: D

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78. AGCT are nitrogenous bases of DNA. The pairing is

:

A. $A-G, C-T$

B. $A-T, G-C$

C. $A-C, G-T$

D. $A-T, G-T$

Answer: B

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79. Why does bytosine make pair with guanine and not with adenine ?

A. C and A are both polar

B. C-A pair would not reach across the double helix

C. C-A pair would be too wide to fit in the double helix

D. The functional groups that form H-bond are not complementary between C and A

Answer: B

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80. Assertion (A) : Adenine cannot pair with cytosine.

Reason ® : Because there wold be two hydrogen

atoms in one of the bonding and none at the other.

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true but (R) is not the correct explanation of (A)

C. (A) is true statement but (R) is false

D. Both (A) and (R) are false

Answer: A

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81. The two strands of DNA are held together by :

A. peptide bonds

B. S-S

C. BONDS

D. Hydrogen bonds

Answer: C

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82. Two strands of double helical model of DNA are held together by H- bonds between :

A. nitrogen bases

B. phosphoric acid

C. sugar and phosphate

D. nitrogen and sugar

Answer: A

83. Double hydrogen bonds occur in DNA between :

A. adenine and thymine

B. thymine and uracil

C. adenine and guanine

D. thymine and cytosine

Answer: A

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84. Hydrogen bonds between cytosine and guanine are :

A. 1

B. 2

C. 3

D. 4

Answer: C

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85. If a highly purified sample of plant DNA is dissolved in distilled water, the resulting solution will be :

A. basic

B. acidic

C. neutral

D. highly basic

Answer: B

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86. The acidic characters of DNA and RNA are due to :

A. purine bases

B. sugar molecules

C. pyrimidine bases

D. phosphoric group

Answer: D

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87. In 3.2 Kbp long piece of DNA, 820 adenine bases were found. What would be the number of cytosine bases ?

A. 780

B. 740

C. 1480

D. 1560

Answer: A

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88. Match the following :

	Set-I		Set-II
A	Chargaff	1	Wilkins and Franklin
B	Replicon	2	Uptake of lactose
C	Permease	3	hn-RNA
D	Split gene	4	Length of DNA
E	X-ray diffraction	5	(A + G) = (C + T)

A. A=5,B=4,C=2,D=3,E=1

B. A=5,B=4,C=1,D=3,E=2

C. A=5,B=4,C=2,D=1,E=3

D. A=5,B=1,C=2,D=3,E=4

Answer: A

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89. Which of the following scientists demonstrated that in DNA, A=T and G=C ?

A. Erwin Chargaff

B. Frederick Griffith

C. Meselson and Stahl

D. Hershey and Chase

Answer: A

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90. DNA has equal number of adenine and thymine residues (A=T) and equal number of guanine and cytosine (G=C). These relationships are known as :

A. Van't Hoff plot

B. Le Chatelier's principle

C. Coulomb's law

D. Chargaff's rule

Answer: D

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91. According to the Chargaff's law :

A. $A + T = G + C$

B. $T + A = C$

C. $A + T + G = C$

D. $A + G/C + T = 1$

Answer: D

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92. Which of the following is correct according to Chargaff's rules ?

A. $A + C = G + T$

B. $A + T = G + C$

C. $A + G = C + T$

D. `All of these

Answer: C

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93. Which one is not ture ?

A. A=G,T=C

B. A=T,G=C

C. C=G,T=A

D. G=C,A=T

Answer: A

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94. Which is false ?

A. $A + G = C + T$

B. $A + T = C + G$

C. A / T is equal to one

D. C / G is equal to one

Answer: B

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95. Who gave the concept that for a double stranded DNA the ratio between $A = T$ and $G = C$ are equal and constant ?

A. Chargaff

B. Watson and Crick

C. Wilkins and Franklin

D. Wilkins and Chargaff

Answer: A

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96. The following ratio is generally constant for a given species :

A. $A = C/T + G$

B. $G + C/A + T$

C. $T + C/G + A$

D. $A + G/C + T$

Answer: B

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97. What would be the percentage of thymine in a double stranded DNA sample, which contains 20% cytosine of the total bases ?

A. 10%

B. 20%

C. 30%

D. 40%

Answer: C

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98. If the total amount of adenine and thymine in a double-stranded DNA is 60% , the amount of guanine in this DNA will be :

A. 15%

B. 20%

C. 30%

D. 40%

Answer: B

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99. What will be the percentage of guanine in a DNA molecule having 20% adenine ?

A. 0.4

B. 0.6

C. 0.2

D. 0.3

Answer: D

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100. In DNA percentage of thymine is 20, then what is the percentage of guanine ?

A. 20

B. 30

C. 40

D. 60

Answer: B

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101. Chargaff's rule is applicable to :

A. single stranded RNA

B. single stranded DNA

C. double stranded DNA

D. single stranded DNA and RNA

Answer: C

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102. You are studying a bacterial virus and found its base composition to be $A = 22\,\%\,, T = 28\,\%\,, G = 20\,\%$ and $C = 30\,\%$.

What is your conclusion regarding its genetic material ?

A. Single stranded RNA

B. Double stranded RNA

C. Single stranded DNA

D. Double stranded DNA

Answer: C

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103. In a sample of DNA the base composition (mole ratio) is found to A=40 , T=22,G=21 and C=17 :

A. DNA is linear duplex

B. DNA is circular duplex

C. DNA is single stranded

D. DNA has high melting point

Answer: C

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104. A- DNA is

A. rarely double stranded

B. rarely single stranded

C. always single stranded

D. always double stranded

Answer: B

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105. Single stranded nucleic acid is found in

A. TMV

B. $\phi \times 174$

C. Polioviruses

D. Rice dwarf virus

Answer: B

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106. The year 2003 was celebrated as the 50^{th} anniversary of discovery of

A. transposon by Barbara McClintock

B. structure of DNA by Watson and Crick

C. both (a) and (b) correct

D. none of the above

Answer: B

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107. Double helical model of DNA molecule was proposed by :

A. Erwin Chargaff

B. Watson and Crick

C. Heinz Fraenkel Conrat

D. Singer and Nicolson

Answer: B

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108. Recipients of Nobel Prize for DNA double helical structure are :

A. Watson and Crick

B. Beadly and Tatum

C. Kornberg and Ochoa

D. Khorana and Nirenberge

Answer: A

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109. Watson and Crick got Noble Prize for proposing DNA model in the year :

A. 1959

B. 1962

C. 1968

D. 1990

Answer: B

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110. To determine the three dimensional structure of DNA, Watson and Crick took the help of :

A. X-ray diffraction

B. Tissue culture

C. Electrophoresis

D. Autoradiography

Answer: A

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111. Radio tracer technique show that DNA is in :

A. multi-helix stage

B. single-helix stage

C. double-helix stage

D. none of these

Answer: C

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112. The double helical model of DNA resembles a twisted ladder in which the rungs of the ladder are :

A. a paried G and C paried with T

B. a purine paired with a pyrimidine

C. sugar - phosphate paired with sugar-phosphate

D. both(a) and (b) are correct

Answer: B

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113. A 340 Å long segment of DNA molecules has 20 thymine nitrogenous bases, what will be the number of guanine nitrogen b ases in the same segment

A. 10

B. 40

C. 160

D. 80

Answer: D

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114. What is true for Watson and Crick's model of DNA ? It is duplexed with :

A. 20 base- pairs and 34Å for each turn

B. 10 base- pairs and 34Å distance for every turn

C. 10 base -pairs with 3.4Å distance for every turn

D. none of the above

Answer: B

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115. Length of one loop of B-DNA is :

A. 10 nm

B. 20 nm

C. 0.34 nm

D. 3.40 nm

Answer: D

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116. Wilkin's X-ray diffraction showed the diameter of the DNA helix as :

A. 10Å

B. 40Å

C. 30Å

D. 40Å

Answer: B

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117. Width of DNA molecule is :

A. 15Å

B. 34Å

C. 25Å

D. 20Å

Answer: D

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118. The length of one full turn of DNA is :

A. 3.4Å

B. 34.0Å

C. 20.0Å

D. 3.04Å

Answer: B

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119. In the double helix modle of DNA , how far is each base pair from the next base pair

A. 34 nm

B. 2.0nm

C. 3.4 nm

D. 0.34 nm

Answer: D

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120. The length of DNA having 23 hase pairs is

A. 78Å

B. 78.4Å

C. 74.2Å

D. 74.8Å

Answer: C

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121. A given double stranded DNA molecule is 10000 base-pairs long. The length of this DNA molecule will be :

A. 10^4 nm

B. 10000 nm

C. 3.4×10^4 nm

D. 200000 nm

Answer: C

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122. Which of the following is correct pair of pyrimidine bases

A. Adenine and thymine

B. Adenine and guanine

C. Guanine and cytosine

D. thymine and cytosine

Answer: D

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123. DNA has :

A. left-handed coiling and parallel

B. right -handed coiling and parallel

C. left-handed coiling and antiparallel

D. right-handed coiling and antiparallel

Answer: D

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124. DNA is double helix and :

A. complementary and antiparallel

B. complementary and parallel

C. without supercoils

D. always circular

Answer: A

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125. DNA is very long in relation to its diameter. If a strand of DNA is 0.1 mm in length, what is the ratio of length to diameter, or the axial ratio ?

A. 5000

B. 50000

C. 10000

D. 100000

Answer: B

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126. Which of the following statements regarding a double - helical molecule of DNA is true ?

A. Each strand is identical

B. Each strand replicates itself

C. Bases are perpendicular to the axis

D. All hydroxyl groups of pentose are involved in linkages.

Answer: C

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127. The coiling of double strands in DNA is :

A. parallel

B. left-handed

C. symmetrical

D. right-handed

Answer: D

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128. A double strand DNA measures 34μ . How many nucleotide pairs will be present ?

A. 10

B. 104

C. 100

D. 105

Answer: C

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129. The single turn of DNA has . . . . . base pairs

A. 8

B. 10

C. 6

D. 100

Answer: B

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130. A DNA contains 20,000 base-pairs.How many nucleotides would be present in ti ?

A. 2000

B. 20000

C. 200000

D. 40000

Answer: D

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131. In a double standed DNA, the sequence of nucleotides in one strand is 3' ATTCGCTAT 5'. What will be the complementary squence on the other strand ?

A. TCGATTCGG

B. CGUAUUCG

C. AGCTAAGC

D. CAUTAUCG

Answer: A

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132. Match the List I with List II and find out the correct answer from the code give below :

	List I		List II
A	Rosalind Franklin	1	Mutation
B	Hugo de Vries	2	Chromosome
C	W. Waldeyer	3	Ribose sugar
D	Levine	4	DNA

A. A=1,B=2,C=4,D=3

B. A=4,B=1,C=3,D=2

C. A=3,B=2,C=1,D=4

D. A=4,B=1,C=2,D=3

Answer: D

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133. Z-DNA was discovered by :

A. Wang and Rich

B. Watson and Crick

C. Meselson and Stahl

D. Frankline and Wilkins

Answer: A

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134. Z- DNA and B- DNA differ in

A. number of helix

B. base pairing

C. conformation

D. constitution of bases

Answer: C

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135. The diameter of Z-DNA molecule is :

A. 18Å

B. 22Å

C. 45Å

D. 34Å

Answer: A

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136. The number of nucleotide pairs in a complete pitch of Z-DNA is :

A. 10

B. 12

C. 11

D. 12.5

Answer: B

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137. Which of the following statements is false ?

A. Rotation per bp in Z-DNA is $+36.0^{\circ}$

B. The helical diameter of A-DNA is 23Å

C. There are 12 base - pairs per turn in Z-DNA

D. Z-DNA is left-handed whereas A,B and C-DNA are right -handed

Answer: A

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138. Match List I with List II and select the correct answer using the codes give below in the lists :

List I (Helix type)	List II (Base-pairs per turn of helix)
A A	1 9.33
B B	2 10
C C	3 11
D Z	4 12

A. A=1,B=4,C=3,D=2

B. A=2,B=1,C=4,D=3

C. A=3,B=2,C=1,D=4

D. A=3,B=2,C=1,D=4

Answer: C

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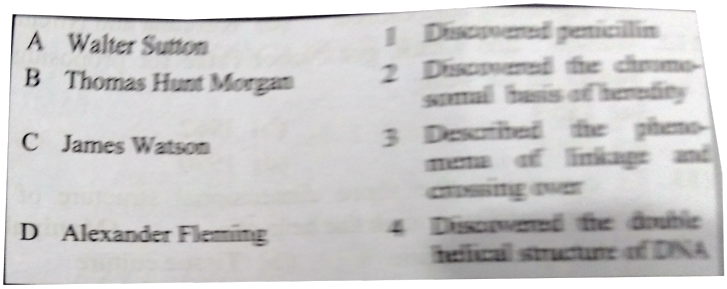
139. Match the following :



A	Walter Sutton	1	Discovered penicillin
B	Thomas Hunt Morgan	2	Discovered the chromosomal basis of heredity
C	James Watson	3	Described the phenomena of linkage and crossing over
D	Alexander Fleming	4	Discovered the double helical structure of DNA

A. A=1,B=4,C=2,D=3

B. A=2,B=3,C=1,D=4

C. A=3,B=2,C=1,D=4

D. A=2,B=3,C=4,D=1

Answer: D

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140. Melting of DNA at an elevated temperature $(70^{\circ}C)$ is primarily due to the breakdown of

A. hydrogen bonds

B. disulphide bonds

C. glycosidic bonds

D. phosphodiester bonds

Answer: A

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141. DNA is denatured by :

A. Heat

B. Acid

C. DNA polymerase

D. Both (a) and (b) correct

Answer: D

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142. If an isolated strain of DNA is kept at 82- 90° C , then

A. no effect

B. it changes into RNA

C. it uncoils and strands separate

D. it divides into one million pieces

Answer: C

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143. Which DNA molecule among the following will melt at lowest temperature ?

A.

$$5' - A - A - T - G - C - T - G - C - 3'$$

$$3' - T - T - A - C - G - A - C - G - 5'$$

B.

$$5' - A - A - T - A - A - A - G - C - 3'$$

$$3' - T - T - A - T - T - T - C - G - 5'$$

C.

$$5' - G - C - A - T - A - G - G - C - 3'$$

$$3' - C - G - T - A - T - C - C - G - 5'$$

D.

$$5' - A - T - G - G - C - T - G - C - 3'$$

$$3' - T - A - C - C - G - A - C - G - 5'$$

Answer: B

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144. Nucleic acid can be fragmented by the enzyme :

A. ligase

B. protasas

C. nuclease

D. polymerases

Answer: C

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145. Which of the following is not true for DNA ?

A. Direct synthesis of proteins

B. Direct synthesis of DNA

C. Direct synthesis of RNA

D. None of the above

Answer: A

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146. Major difference between DNA and c DNA is

A. exons absent in DNA

B. introns absent in Cdna

C. introns present in cDNA

D. Both (a) and (b) correct

Answer: B

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147. Genes were first artificially synthesized by :

A. Galton

B. Watson

C. Mendel

D. Khorana

Answer: D

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Dna Replication

1. Duplication of DNA is termed :

A. translation

B. replication

C. transcription

D. transduction

Answer: B

Watch Video Solution

2. Replication is :

A. DNA $\rightarrow$ DNA

B. DNA $\rightarrow$ RNA

C. RNA $\rightarrow$ DNA

D. DNA $\rightarrow$ Proteins

Answer: A

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3. DNA synthesis takes place during :

A. interphase

B. prophase

C. metaphase

D. anaphase

Answer: A

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4. DNA duplication takes place during :

A. only in S phase

B. only in G_1 phase

C. only in G_2 phase

D. entire interphase

Answer: A

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5. The process of DNA replication is :

A. dispersive

B. conservative

C. semiconservative

D. nonconservative

Answer: C

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6. DNA replication is :

A. continuous and conservative

B. semiconservative and discontiuous

C. conservative and semidiscontinuous

D. semiconservative and semidiscontinuous

Answer: C

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7. Mode of DNA replication in E. coli is :

A. conservative and bidirectional

B. conservative and unidirectional

C. semiconservative and bidirectional

D. semiconservative and unidirectional

Answer: C

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8. The Experimental Proof Of Replication

A. Joh Cairns

B. Herbert Taylor

C. Watson and Crick

D. Meselson and Stahl

Answer: C

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9. Experiments using $.^{15}N$ (heavy nitrogen) to confirm the semiconservative replication of DNA were carried out by :

A. Watson and Crick

B. Hershey and Chase

C. Beadle and Tatum

D. Meselson and Stahl

Answer: D

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10. DNA replicates semi-conservatively was first shown in :

A. Vicia faba

B. E. coli

C. Drosophila

D. Caenorhabditis elegans

Answer: B

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11. Isotopes used for proving semiconservative replication of DNA were :

A. $._{}^{14}N$ and $._{}^{31}P$

B. $._{}^{14}N$ and $._{}^{14}C$

C. $._{}^{14}N$ and $._{}^{15}N$

D. $._{}^{14}C$ and $._{}^{31}p$

Answer: C

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12. Escherichia coli with completely radioactive DNA was allowed to replicate in nonradioactive medium for two generations. Percentage of bacteria with radioactive DNA is :

A. 12.5

B. 25

C. 50

D. 100

Answer: C

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13. Escherichia coli fully labelled with $.^{15}N$ is allowed to grow in $.^{14}N$ medium. The two strands of DNA molecule of the first generation of bacteria have :

A. same density and resemble parent DNA

B. different density but resemble parent DNA

C. same density but do not resemble parent DNA

D. different density and do not resemble parent DNA

Answer: D

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14. If you grow bacteria in heavy nitrogen and then switched them to light nitrogen, how many generations after switching would have some light / light DNA ?

A. First generation

B. Second generation

C. Only the third generation

D. Never, because replication is semiconservative

Answer: B

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15. Taylor demonstrated semiconservative chromosome replication in :

A. Vicia faba

B. Ha La cell

C. Pisum sativum

D. Mouse liver cell

Answer: A

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16. DNA having labelled thymidine is allowed to replicate in medium having nonradioactive thymidine. After three duplications, the DNA molecules having labelled thymidine shall be :

A. one

B. two

C. four

D. eight

Answer: B

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17. During replication of a bacterial chromosome DNA syntnthesis stars from a replication origin site and

A. RNA primers are involved

B. Is facilitate by telomerase

C. Moves in bidirectional way

D. Moves in one direction of the site

Answer: C

18. The $3' - 5'$ phosphodiester linkae inside a polynucleotide chain serve to join :

A. one nucleoside with another nucleoside

B. one nucleoside with another nucleotide

C. one nitrogenous base with pentose sugar

D. one DNA strand with the other DNA strand

Answer: B

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19. During DNA replication in prokaryotes DNA is anchored to :

A. ribosome

B. nucleolus

C. mesosome

D. chromosome

Answer: C

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20. DNA replication in eukaryotes commences :

A. from centromere to either end

B. from one end of chromosome to other

C. from both ends of a chromosome simultaneously

D. several sites along DNA of a chromosome simultaneously

Answer: D

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21. There are special proteins that help to open up DNA double helix in front of the replication fork.

These proteins are :

A. DNA ligas

B. DNA gyrase

C. DAN polymerase I

D. None of these

Answer: B

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22. Durning DNA replication, the strands separate by

A. gyrase

B. unwindase

C. topoisomerase

D. DNA polymerase

Answer: B

23. Which of the following is true for DNA helicases ?

A. DNA helicases hydrolyse ATP

B. DNA helicases are ATP dependent unwinding enzymes

C. Promote separation of two parental strands and establish replication forks

D. All of the above

Answer: D

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24. The enzyme that reduces the tension during the unwinding of DNA helix in front of the replication fork is :

A. ligase

B. helicase

C. polymerase

D. topoisomerase

Answer: D

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25. The enzyme, which helps to one starnd of DNA duplex to release tension of coiling of two strands is

A. DNA ligase

B. Topoisomerase

C. DNA polymerase I

D. Swielases (helicase or unwindases)

Answer: B

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26. The enzyme which relaxes supercoiled DNA is :

A. Primase

B. DNA gyrase

C. Topoisomerase I

D. DNA polymerase III

Answer: C

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27. During polynucleotide synthesis by the following enzymes, in which case elongation occurs in $5' \rightarrow 3'$ direction ?

A. DNA plymerase

B. RNA plymerase

C. Reverse transcriptase

D. All the above

Answer: D

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28. The enzyme required to catayze the polymerzatio of deoxynucleotides is

A. DNA polymerase

B. Rnases

C. DNA ligase

D. $\beta -$ galactosidease

Answer: A

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29. DNA polymerase helps in

A. renaturation of DNA

B. proof reading of RNA

C. joining monomers of DNA

D. splitting of two DNA strands

Answer: C

Watch Video Solution

30. DNA polymerase III catalyses :

A. repair of DNA

B. replication of DNA

C. translation of m-RNA

D. joining of ends of DNA

Answer: B

31. DIFFERENCE BETWEEN DNA & RNA POLYMERASE

A. synthesizes RNA primer to initiate DNA synthesis

B. fills the gap between Okazaki fragments

C. works only in a $5'$ to $3'$ direction

D. edits as it synthesizes

Answer: A

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32. The elongation of the leading strand during DNA synthesis :

A. occur in $3' \rightarrow 5'$ direction

B. produces Okazaki fragment

C. depend on the action of DNA polymerase

D. Progresses away from the replication fork

Answer: C

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33. The prokaryotic enzymes with 5' to 3' exonuclease property is//are

A. DNA ligase

B. DNA polymerase III

C. DNA polymerase II

D. DNA polymerase II

Answer: D

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34. DNA repair in eukaryotes is carried out mainly by

:

A. DNA polymerase δ

B. DNA polymerase α

C. DNA polymerase β

D. DNA polymerase ε

Answer: D

Watch Video Solution

35. DNA repairing is done by

A. ligase

B. DNA polymerase II

C. DNA polymerase II

D. DNA polymerase III

Answer: B

Watch Video Solution

36. DNA polymerase λ promotes :

A. DNA repaire

B. Synthesis of leading strand

C. Synthesis of lagging strand

D. Replication of mitochondrial DNA

Answer: D

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37. Replication of DNA is in

A. 3' end towards 5' end

B. 5' end towards 3' end

C. amino terminus to carboxy terminus

D. carboxy terminus to amino terminus

Answer: B

Watch Video Solution

38. Replication of DNA is in

A. $3' \rightarrow 5'$ direction

B. $2' \rightarrow 5'$ direction

C. both $3' \rightarrow 5'$ and $5' \rightarrow 3'$ direction

D. none of the above

Answer: C

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39. DNA strand which is formed continuously in $5' \rightarrow 3'$ direction is called :

A. lagging strand

B. leading strand

C. template strand

D. stranded strand

Answer: B

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40. Choose the correct statement about the direction of DNA strand

A. $5' \rightarrow 3'$ takes place on template strand

B. $5' \rightarrow 3'$ takes place on leading strand

C. $3' \rightarrow 5'$ takes place on new strand

D. None of the above

Answer: B

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41. Match List I with List II and select the correct answer using the code given below in the lists.

	List I	List II
1	Ligase	Joins short segments of DNA together
2	DNA polymerase	Cuts DNA at specific DNA sequence
3	Helicase	Breaks the hydrogen bonds between complementary pairs during DNA replication

A. 1,2 and 3 are correct

B. 1 and 2 are correct but 3 is false

C. 1 is correct but 2 and 3 are false

D. 1 and 3 are correct but 2 is false

Answer: D

42. DNA replication starts in the $5' \rightarrow 3'$ directino because :

A. DNA polymerase I performs editing function.

B. DNA plymerase I is responsible for polymerization

C. DNA polymerase II can link up only in $5' \rightarrow 3'$ direction

D. DNA polymerase III can polymerize the nucleotides in the $5' \rightarrow 3'$ direction.

Answer: D

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43. During DNA replication, the sequence specificity of bases in the newly synthesized strand is determined by :

A. Template strand

B. DNA polymerase I

C. DNA polymerase II can link up only in $5' \rightarrow 3'$ direction

D. Restriction endonuclease

Answer: A

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44. Which of the following enzymes makes short RNA chains using a DNA template ?

A. Primase

B. DNA gyrase

C. DNA helicase

D. DNA polymerase I

Answer: A

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45. During the replication of DNA, the synthesis of DNA on lagging strand takes place in segments, these segments are called :

A. Satellite segments

B. Okazaki segments

C. Kornberg segments

D. Double helix segments

Answer: B

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46. Okazaki is famous for his studies on :

A. Gene expression

B. DNA replication

C. Somatic mutations

D. Somatic hybridization

Answer: B

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47. Okazaki fragments are associated with which phenomenon ?

A. Translation

B. Transcription

C. Replication of DNA

D. Reverse transcription

Answer: C

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48. Okazaki fragments are :

A. DNA fragments resulted on the lagging strand

B. Short DNA fragments on the lagging strand

C. Short DNA fragments on the leading strand

D. DNA fragments produced due to radiation action

Answer: B

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49. Okazaki fragments are synthesized on :

A. both leading and laggind strands of DNA

B. leading strand of DNA only

C. lagging strand of DNA only

D. complementary DNA

Answer: C

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50. Okazaki segments are formed during or DNA multiplication is called

A. synthesized on the leading strand of DNA replication fork

B. synthesized on the lagging strand of DNA by replication fork

C. produced during the digestion of DNA by restriction endonuclease

D. produced by sonication of DNA sample

Answer: B

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51. The Okazaki fragments in DNA chain growth :

A. result in transcription

B. prove semiconservative nature of DNA replication

C. polymerize in the $3'$ to 5' direction and explain 3' to 5' DNA fork

D. polymerize in the 5' to 3' direction and explain 3' to 5' DNA replication

Answer: D

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52. If the DNA of humans contains $3 \times 10^9 bp$, and if an Okazaki fragment, on average, is 2000 bp long, how many initiation points of RNA primase are present in the genome ?

A. 1.5×10^6

B. 3.5×10^6

C. 1.5×10^9

D. 1.0×10^6

Answer: A

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53. The 5' end of each Okazaki fragment has :

A. ACC

B. AUG

C. ribonucleotide

D. deoxyribonucleotide

Answer: D

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54. Okazaki fragments are joined in a correct sequence by :

A. Primase

B. Helicase

C. DNA ligase

D. RNA polymerase

Answer: C

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55. The enzyme used to join the DNA fragments is :

A. ligase

B. Primase

C. Endonuclease

D. DNA polymerase

Answer: A

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56. Which of the following is an enzyme used to form a phosphodiester bond in link between a 3' end of one DNA chain and 5' end of another ?

A. DNA ligase

B. DNA polymerase

C. Phosphodiesterase

D. Restriction endonuclease

Answer: A

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57. DNA replication includes :

A. DNA polymerase and ligase

B. RNA polymerase

C. DNA ligase

D. ALL of the above

Answer: D

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58. Other than DNA polymerase, which of the following enzymes involved in DNA synthesis ?

A. Ligase

B. Dnase

C. DNA polymerase

D. RNA polymerase

Answer: B

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59. During DNA replication, the sequence $5'$-TpApGpAp $= 3'$ would produce which of the following complementary structures ?

A. $5' - ApTpCpTp - 3'$

B. `5'"UpCpUpAp"-3'

C. $5' - \mathrm{TpCpTpAp} - 3'$

D. $5' - \mathrm{GpCpGpAp} - 3'$

Answer: C

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60. If one strand of DNA has the sequence CAT, GAC, TAG, what would be the base sequence in the other strand ?

A. GTA, CTG,ATC

B. GAT,GTC,ACT

C. TAC,ACT,GCT

D. CAT,TAG, GAC

Answer: A

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61. If one strand of DNA has the nitrogenous base sequence ATGCTTGA, the sequence in the complementary strand will be :

A. `TACGAACT

B. TACGTACT

C. TAGGTAGT

D. TCCGAACT

Answer: A

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62. If one strand of DNA has the nucleotide sequence 5' GATCAA 3', its complementary strand will have the sequence :

A. 5' CTAGTT 3'

B. 5'TTCATC 3'

C. 5' TTGATC 3'

D. 5' TTGTTC 3'

Answer: C

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63. In double stranded DNA, the sequence of base-pairs in one strand are AGCTAAGC. What is the complementary sequence on the other strand ?

A. CGUAUUCG

B. AGCTAAGC

C. CAUTAUGCG

D. TCGATTCG

Answer: D

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64. Which of the following enzymes adds noncoding sequences at chromosome ends ?

A. Helicase

B. Telomerase

C. DNA polymerase β

D. DNA polymerase ε

Answer: B

Watch Video Solution

65. Which one of the following DNA is synthesized on RNA template ?

A. Telomeric DNA

B. Ribosomal DNA

C. Centrameric DNA

D. Mitochondrial DNA

Answer: A

View Text Solution

66. DNA is not directly involved with the synthesis of the following

A. t-RNA molecule

B. protein molecule

C. m-RNA molecule

D. another DNA molecule

Answer: B

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67. The distance between two base - pairs in DNA is :

A. 34Å

B. 3.4Å

C. 0.34Å

D. 20Å

Answer: B

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68. E. coli about to replicate was placed in a medium containing radioactive thymidine for five minutes. Then it was made to replicate in a normal medium. Which of the following observation will be correct ?

A. Both the strands of DNA will be radioactive

B. Each strand half radioactive

C. One strand radioactive

D. None is radioactive

Answer: C

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69. Match the following :

A	t-RNA	1	Linking of amino acids
B	m-RNA	2	Transfer of genetic information
C	r-RNA	3	Nucleolar organising region
D	Peptidyl transferase	4	Transfer of amino acid from cytoplasm of ribosome

A. A=4,B=2,C=3,D=1

B. A=2,B=4,C=3,D=2

C. A=1,B=2,C=3,D=4

D. A=1,B=2,C=3,D=4

Answer: A

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70. In DNA, the complementary bases are :

A. Uracil and adenine, cytosine and guanine

B. Ademine and thymine, guanine and uracil

C. Adenine and thymine , guanine and cytosine

D. Adenine and guanine, thymine and cytosine

Answer: C

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71. In the DNA molecule

A. the total amount of purine nucleotides and pyrimidine nucleotides is not always equal

B. the proportion of adenine in relation to thymine varies with the organism

C. there are two strands which run parallel in the $5' \rightarrow 3'$ direction

D. there are two strands which run antiparallel one in $5' \rightarrow 3'$ direction and other in $3' \rightarrow 5'$ direction

Answer: D

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72. Match List -I and List -II and select the answer using the codes :

List-I (Scientists)	List-II (Discovery)
1. Frederick Griffith	Transformation
2. Gamow	A sequence of 3 nucleotides codes for a single amino acid
3. Frederick Miescher	Isolated DNA for the first time

A. 1,2 and 3 are correct

B. 1 and 2 are correct

C. 2 and 4 are correct

D. 1 and 3 are correct

Answer: A

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73. In a DNA molecule, the adenine is $15\ \%$. What will be the percentage of guanine in this DNA ?

A. 0.15

B. 0.35

C. 0.7

D. 0.3

Answer: B

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74. DNA can be formed by :

A. Lyases

B. Transaminase

C. RNA dependent DNA polymerase

D. All of the above

Answer: C

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75. The RNA primer is used in :

A. translation

B. replication

C. conjugation

D. transformation

Answer: B

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76. Meselson Stahl experiment on semiconservative replication demonstrate that :

A. 50% radioactive, 50% non- radioactive

B. 50% non-radioactive

C. 50% radioactive

D. none of the above

Answer: A

77. The method developed by Matthew Meselson and Franklin Stahl to separate heavy DNA with $\hat{}(15)$N from DNA with $\hat{}(14)$ N, for providing evidence for semi- conservative replication of DNA is

A. gel filtration

B. isopycnic centrifugation

C. buoyant density centrifugation

D. ion exchange chromatography

Answer: C

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78. Assertion (A) : Replication and transcription occur in the nucleus but translation occurs in the cytoplasm.

Reason (R) : m-RNA is transferred from the nucleus into the cytoplasm where ribosomes and amino acids are available for protein synthesis.

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true but (R) is not the correct explanation of (A)

C. (A) is true statement but (R) is false

D. Both (A) and (R) are false

Answer: A

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79. Assertion (A) : DNA code is copied in the synthesis of m-RNA.

Reason (R) : t-RNA moves out of nucleus and after attaching on ribosomes form the template.

A. Both (A) and (R) are true and (R) is the correct explanation of (A)

B. Both (A) and (R) are true but (R) is not the correct explanation of (A)

C. (A) is true statement but (R) is false

D. Both (A) and (R) are false

Answer: C

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80. The strand of DNA acting as template for m-RNA transcription is :

A. Sense strand" "B. Coding strand

C. Anti - sense " "D. Non-coding strand

The correct answer is :

A. A and C

B. A and D

C. B and C

D. C and D

Answer: D

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81. Which of the following be named for DNA produced from RNA ?

A. c-DNA

B. Z-DNA

C. A-DNA

D. B-DNA

Answer: A

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82. Semiconservative replication of DNA was first demonstrated in

A. Escherichia coli

B. Salmonella typhimurium

C. Drosophila melanogaster

D. Streptococcus pneumoniae

Answer: A

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83. Whose experiments cracked the DNA and discovered unequivocally that a genetic code is a "triplet " ?

A. Beadle and Tatum

B. Hershey and Chase

C. Nirenberg and Matthaei

D. Morgan and Sturtevant

Answer: C

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84. There is no DNA in

A. hair root

B. mature RBCs

C. an enucleated ovum

D. a mature spermatozoan

Answer: B

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85. In microbial genetics which one is referred to as "Griffith effect"?

A. Sexduction

B. Conjugation

C. Transduction

D. Transformation

Answer: D

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86. The anti -paralle nature of DNA refers to

A. Its charged phosphate groups

B. The opposite direction of the two strands

C. The pairing of bases on one strand with bases on the other strand

D. The formation of hydrogen bonds between bases from opposite strands.

Answer: B

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87. Among the nitrogenous bases involved in DNA and RNA formation, the double ring base is :

A. uracil

B. guanine

C. thymine

D. cytosine

Answer: B

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88. In a double stranded DNA molecule , the percentage of cytosine is 18. What would be the percentage of adenine ?

A. 0.32

B. 0.64

C. 0.36

D. 0.18

Answer: A

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89. In DNA of certain organisms, guanine constitutes 20% of the bases. What percentage of the bases would be adenine

A. 0

B. 0.1

C. 0.3

D. 0.2

Answer: C

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90. In a nucleotide having a cytosine base and linked to a sugar by glycosidic bond at carbon number :

A. 1

B. 2

C. 4

D. 5

Answer: A

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91. The part of molecule that varies among DNA molecule is

A. Phosphate molecule

B. nitrogen base

C. sugar molecule

D. all of these

Answer: B

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92. There is no DNA in

A. hair root

B. mature RBCs

C. an enucleated ovum

D. a mature spermatozoan

Answer: B

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93. Which DNA replication starts

A. the phosphodiester bonds between the adjacent nucleotides break

B. the bonds between the nitrogen base and deoxyribose sugar break

C. the leading strand produces Okazaki fragments

D. the hydrogen bonds between the nucleotides of two strands break.

Answer: D

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94. During replication of DNA, Okazaki fragments are formed in the direction of :

A. $3' \rightarrow 5'$

B. $5' \rightarrow 3'$

C. $5' \rightarrow 5'$

D. $3' \rightarrow 3'$

Answer: B

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95. True replication of DNA is possible due to

A. hydrogen bonding

B. phosphate backbone

C. complementary base paring rule

D. None of the above

Answer: C

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96. If the total amount of adenine and thymine in a double stranded DNA is 45% the amount of guanine this DNA will be :

A. 0.45

B. 0.55

C. $22.5\ \%$

D. $27.5\ \%$

Answer: D

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97. Purines have nitrogen atoms at _____ positions.

A. 1,3,7 and 9 position

B. 1,3,5 and 7 position

C. 1,2,6 and 8 position

D. 1,2,4 and 6 position

Answer: A

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98. During Meselson and Stahl's experiments, heavy DNA was distinguished from normal DNA by cetnrifugation in :

A. $.^{35} SO_2$

B. $.^{14} NH_4Cl$

C. $.^{15} NH_4Cl$

D. CsCl gradient

Answer: D

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99. DNA gyrase, the enzymes that participates in the process of DNA repliation is a type of :

A. DNA ligase

B. DNA polymerase

C. DNA topoisomerase

D. Reverse transciptase

Answer: C

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100. Given below is a sample of a portion of DNA strand giving the base sequence on the opposite strands. What is so special shown in it ?

$5'\_GAATTC\_3'$

$3'\_CTTAAG\_5'$

A. Delection mutation

B. Replication completed

C. Stard codon at the 5' end

D. Palindromic sequence of base pairs

Answer: D

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101. The double helical model of the DNA was proposed by Watson and Crick based on what data produced by wilkins and Franklin

A. Hybridization

B. DNA sequencing

C. Southern blotting

D. X- ray diffraction

Answer: D

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102. The pyrimidine base which confers additional stability to DNA over RNA is :

A. adenine

B. guanine

C. cytosine

D. thymine

Answer: D

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103. In Hershey and Chase experiments , radioactive $.^{32}P$ was used to culture bacteriophages which resulted in radioactive :

A. viral DNA

B. viral proteins

C. bacterial capsule

D. plasma membrane of bacteria

Answer: A

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104. The unequivocal proof of DNA as the genetic material came from the studies on :

A. Fungus

B. Viroid

C. Bacterium

D. Bacterial virus

Answer: D

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105. In a double standed DNA, the sequence of nucleotides in one strand is 3' ATTCGCTAT 5'. What will be the complementary squence on the other strand ?

A. 3'TAAGCGATA5'

B. 5'TAAGCGATA3'

C. 5' ATTCGCTAT3'

D. 5' TAAGCGTTA3'

Answer: B

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106. c-DNA is a :

A. Complementary ss-DNA produced from template m-RNA

B. Complementary DNA produced from template DNA

C. Short segment of DNA present in cytoplasm

D. Cytoplasmic DNA of mitochondria

Answer: A

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107. During DNA replication, the torques are relieved by the enzyme :

A. DNA ligase

B. DNA polymerase I

C. DNA helicase

D. DNA gyrase

Answer: D

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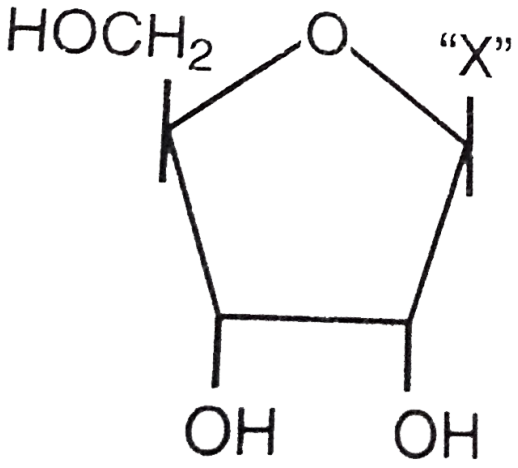
108. The given diagrammatic representation shows one of the categories of small molecular weight organic compounds in the living tissues. Identify the category shown and the one blank component "X" in it :



A. Category: Amino acid; Component: NH_2

B. Category: Nucleotide; Component: Uracil

C.	Category Nucleoside	Component Adenine
D.	Category Cholesterol	Component Guanine

Answer: C

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109. Read the following statements and choose the correct option.

A. Nitrogenous base is linked to the pentose sugar through a N- glycosidic linkage.

B. Phosphate group is linked to 5'-OH of a nucleoside through phosphoester linkage.

C. Two nucleosides are linked through 3'-5' N-

glycosidic linkage.

D. Negatively charged DNA is wrapped around positively charged histone octamer to form nucleosome.

A. A alone is wrong

B. D along is wrong

C. C and E alone are wrong

D. A,B and D alone are wrong

Answer: C

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110. Match the coloumn I with column II and choose the correction option :

	Column I		Column II
A	Incomplete dominance	1	Hershey and Chase
B	Linkage	2	*Antirrhinum* sp.
C	Transforming principle	3	Griffith
D	Proved that DNA is the genetic material	4	Morgan

A. A=1,B=4,C=3,D=2

B. A=4,B=2,C=3,D=1

C. A=2,B=4,C=4,D=1

D. A=2,B=4,C=3,D=1

Answer: D

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111. A-DNA is :

A. left-handed helix with 11 nucleotide pairs per turn

B. left-handed helix with 12 nucleotide pairs per turn

C. right-handed helix with 11 nucleotide pairs per turn

D. right-haned helix with 12 nucleotide pairs per tunr

Answer: C

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112. Okazaki fragments are :

A. large DNA segments having promoter, initiation, coding and terminator regions

B. short segments of replicated DNA formed from DNA template with polarity $5' \rightarrow 3'$

C. additional nucleotides added to the ends of RNA

D. short segments of wrong bases introduced during replication

Answer: B

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113. The sequence of nitrogenaous bases in one strand of DNA are 3' TAC GCG ACG 5' . The complementary DNA strand should have :

A. 5' AUG CGC TGC 3'

B. 3' ATG CGC TGC 5'

C. 5' UAC GCG ACG 3'

D. 5' ATG CGC TGC 3'

Answer: D

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114. The double helix of DNA is made of polynucleotide chains where backbone constituted by sugar-phosphate and bases are projected :

A. inside

B. outside

C. one base inside and the other outside

D. bases remain in line of sugar - phosphate

Answer: A

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115. Match the following and choose the correct combination from the options given .

	Column I (Chemical compounds)		Column II (Example)
A	Nitrogen base	1	RNA
B	Nucleoside	2	Thymidylic acid
C	Nucleotide	3	Cytidine
D	Nucleic acid	4	Uracil

A. A-1,B-2,C-3,D-4

B. A-1,B-3,C-2,D-4

C. A-4,B-3,C-2,D-1

D. A-4,B-1,C-2,D-3

Answer: C

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116. Identify the wrong statement about DNA.

A. Deoxythymidine is a nucleoside.

B. Thymine is chemically 5-methyl uracil.

C. Cytosine is common to both DNA and RNA.

D. In a nucleotide , the nitrogenous base is linked to a phosphate group.

Answer: D

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117. Which property among these listed below is not a criteria for a molecule to act as a gentic material ?

A. Generate its replica.

B. Chemically and structurally stable.

C. Destroy itself after every cell cycle.

D. Mutate slowly to facilitate evolution.

Answer: C

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118. Choose the correct statement.

A. Haploid content of human DNA is $4.6 \times 10^6 bp$.

B. A nitrogenous base is linked to pentose sugar through phosphodiester linkage

C. DNA as an acidic substance was first identified by Watson and Crick.

D. X-ray diffraction data of Mauric Wilkins and Rosalind Franklin was the basis of Watson and Crick's DNA model.

Answer: D

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119. Who gave semiconservative mode of DNA replication for the first time in E. coli with the help of $.^{15}N$ heavy nitrogen isotope ?

A. Watson and Crick

B. Meselson and Stahl

C. Luria and Delbruck

D. Kornberg and Ochoa

Answer: B

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120. The result of which of the following reaction experiments carried out by Avery et al. on Streptococcus pneumoniae has proved conclusively that DNA is the genetic material ?

A. Live 'R' strain + DNA from 'S' strain + Rnase

B. Live 'R' strain + DNA from 'S' strain + Dnase

C. Heat killed 'R' strain + DNA from 'S' strain + Dnase

D. Live 'R' strain + Denatured DNA of 'S' strain + protease

Answer: B

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121. A stretch of DNA consisting of 10-20 bases is most appropriately be called as :

A. nucleotides

B. nucleosides

C. polynucleotide

D. oligonucleotide

Answer: D

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122. In sea urchin DNA, which is double stranded, 17% of the bases were show to be cytosine. The percentages of the other three bases expected to be present in this DNA are

A. $G17\,\%$, $A33\,\%$, $T33\,\%$

B. $G8.5\,\%$, $A50\,\%$, $T24.5\,\%$

C. $G34\,\%$, $A24\,\%$, $T24.5\,\%$

D. $G17\,\%$, $A16.5\,\%$, $T32.5\,\%$

Answer: A

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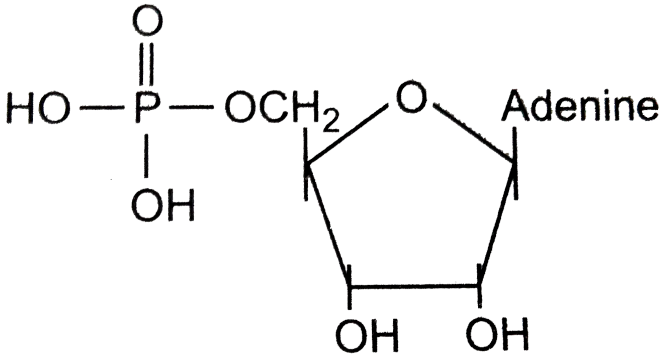
123. The given organic compound is a diagrammatic representation of :



A. lecithin

B. uridine

C. adenosine

D. adenylic acid

Answer: D

124. In the ribose of RNA, unlike DNA, every nucleotide residue has an additional :

A. Phosphate group in the 2' position

B. COOH group in the 2' position

C. OH group in the 2' position

D. OH group in the 5' position

Answer: B

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125. Nucleosome core is intimately associated with

A. They are similar to endosomes.

B. Negatively charged histone octamers.

C. They are the transforming principles discoved by Griffith.

D. A structure formed by wrapping of negatively charged DNA around positively charged histone octamer.

Answer: d

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126. Nucleosome contains :

A. only DNA

B. only histone protein

C. both DNA and RNA

D. both DNA and histone protein

Answer: D

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127. During polynucleotide synthesis by the following enzymes, in which case elongation occurs in $5' \rightarrow 3'$ direction ?

A. DNA polymerase

B. RNA polymerase

C. Reverse transcriptase

D. All the above

Answer: D

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128. A molecule to act as a genetic material has the following properties.

(i) should be able to replicate

(ii) should be structurally more stable

(iii) shoulbe be more reactive and labile

(iv) shoulde provide scope for slow charnges

Choose the correct option :

A. (i),(ii) and (iii) are correct

B. (i),(ii) and (iv) are correct.

C. (iii) and (iv) are correct.

D. (iii) alone is correct.

Answer: B

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129. Choose the correct statement among the following :

A. Taylor and his colleagues used E. coli to prove semi-conservative replication of DNA.

B. In Griffith's experiment the mice infected with R- strain of Streptococcus pneumoniae died due to pneumonia

C. Hershey and Chase proved the transforming principle experimentally.

D. Semi-conservative replication was experimentally proved by Meselson and Stahl.

Answer: D

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130. The nitrogen base found only in DNA is also called

A. Uracil

B. Gaunine

C. NH_4Cl

D. 5-methyl uracil

Answer: D

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131. In griffith's experiment, the conversion of R-type to S-type of Diplococcus pneumoniae when mixed with heat killed S-type is called

Or

The uptake of naked DNA by bacteria is called

A. mutation

B. transduction

C. transfection

D. transformation

Answer: D

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132. During DNA replication, the addition of nucleotides on the lagging strand occurs

A. continuouly

B. discontinuously

C. toward the replicating fork

D. at a faster rate than leading strand

Answer: B

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133. Which of the following is not application of RNA

:

A. Chargaff's rule

B. Complementary base pairing

C. Heterocyclic nitrogenous bases

D. 5' phosphoryl and 3' hydroxyl ends

Answer: A

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134. Taylor conducted the experiment to prove semiconservative mode of chromosomereplication on :

A. E. coli

B. Vinca rosea

C. Vicia faba

D. Drosophila melanogaster

Answer: C

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135. A molecule that can act as a genetic material must fulfill the traits give 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'.

Answer: B

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136. DNA-dependent RNA polymerase catalyzes transcription on one strand of the DNA which is called the :

A. Alpha strand

B. Antistrand

C. template strand

D. Coding strand

Answer: C

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