Molecular Basis of Inheritance

Question 1.

In a DNA strand the nucleotides are linked together by

- (a) glycosidic bonds
- (b) phosphodiester bonds
- (c) peptide bonds
- (d) hydorgen bonds.

Answer:

(b) phosphodiester bonds

Ouestion 2.

The net electric charge on DNA and histones is

- (a) both positive
- (b) both negative
- (c) negative and positive, respectively
- (d) zero.

Answer:

(c) negative and positive, respectively

Question 3.

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 conferes resistance to acquiring malaria.
- (d) All of the above.

Answer:

(d) All of the above.

Question 4.

The first genetic material could be

- (a) protein
- (b) cabohydrates
- (c) DNA
- (d) RNA.

Answer:

(d) RNA.

Question 5.

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.

Answer:

(c) chromosome 1 and Y







Question 6.

Who amongst the following scientist had no contribution in the development of the double helix model for the structure of DN A?

- (a) Rosalind Franklin
- (b) Maurice Wilkins
- (c) Erwin Chargaff
- (d) Meselson and Stahl

Answer:

(b) Maurice Wilkins

Question 7.

Which of the following steps in transcription is catalysed by RNA polymerase?

- (a) Initiation
- (b) Elongation
- (c) Termination
- (d) All of the above

Answer:

(d) All of the above

Question 8.

Control of gene expression takes place at the level of

- (a) DNA-replication
- (b) transcription
- (c) translation
- (d) none of the above.

Answer:

(b) transcription

Question 9.

Which was the last human chromosome to be completely sequenced?

- (a) Chromosome 1
- (b) Chromosome 11
- (c) Chromosome 21
- (d) Chromosome X

Answer:

(a) Chromosome 1

Question 10.

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.

Answer:

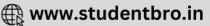
(c) cDNA

Question 11.

If the sequence of initrogen bases of the coding strand of DNA in a transcription unit is: 5' – ATGAATG – 3', the sequence of bases in its RNA transcript would be

(a) 5' - AUG A AUG - 3'





- (b) 5' UACUU AC 3'
- (c) 5' CAUUCAU 3'
- (d) 5' GUAAGUA 3'.

(d) 5' - GUAAGUA - 3'.

Question 12.

The RNA polymerase holocnzyme transcribes

- (a) the promoter, structural gene and the terminator region.
- (b) the promoter and the terminator region
- (c) the structural gene and the terminator region
- (d) the structural gene only.

Answer:

(b) the promoter and the terminator region

Question 13.

If the base sequence of a codon in mRNA is 5' - AUG - 3' the sequence of tRNA pairing with it must be

- (a) 5' UAC 3'
- (b) 5' CAU 3'
- (c) 5'-AUG -3'
- (d) 5' GUA 3'

Answer:

(b) 5' - CAU - 3'

Question 14.

The amino acid attaches to the tRNA at its

- (a) 5'- end
- (b) 3' end
- (c) anticodon site
- (d) DHUloop.

Answer:

(b) 3' - end

Question 15.

To initiate translation, the wiRNA first bind to

- (a) the smaller ribosomal sub-unit
- (b) the larger ribosomal sub-unit
- (c) the whole ribosome
- (d) no such specificity exists.

Answer:

(a) the smaller ribosomal sub-unit

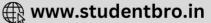
Question 16.

In E. colt, 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.







(a) lactose is present and it binds to the repressor

Question 17.

In DNA strand, the nucleotides are linked together by

- (a) glycosidic bonds
- (b) phosphodiester bonds
- (c) peptide bonds
- (d) hydrogen bonds.

Answer:

(b) phosphodiester bonds

Ouestion 18.

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%

Answer:

(c) 30%

Question 19.

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) TACTACGT
- (d) UACGUACGU

Answer:

(c) TACTACGT

Question 20.

How far is each base pair from the next one in DNA double helix model?

- (a) 2 nm
- (b) 3.4 nm
- (c) 34 nm
- (d) 0.34 nm

Answer:

(d) 0.34 nm

Question 21.

Synthesis of DNA from RNA is explained by

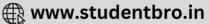
- (a) central dogma reverse
- (b) reverse transcription
- (c) feminism
- (d) all of these.

Answer:

(d) all of these.







Question 22.

Histone proteins are

- (a) basic, negatively charged
- (b) basic, positively charged
- (c) acidic, positively charged
- (d) acidic, negatively charged

Answer:

(b) basic, positively charged

Question 23.

The structure in chromatin seen as 'beads-on string' when viewed under electron microscope are called

- (a) nucleotides
- (b) nucleosides
- (c) histone octamer
- (d) nucleosomes.

Answer:

(d) nucleosomes.

Question 24.

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.

Answer:

(c) It is transcriptionally active.

Question 25.

They year 2003 was celebrated as the 50th anniversary of discovery of

- (a) transposons by Barbare Me Clintock
- (b) structure of DNA by Watson and Crick
- (c) Mendel's laws of inheritance
- (d) biotechnology by Kary Muliis.

Answer:

(b) structure of DNA by Watson and Crick

Question 26.

The process of transofrmation is not affected by which of the following enzymes?

- A. DNase
- B. RNase
- C. Peptidase
- D. Lipase
- (a) A, B
- (b) A, B, C, D
- (c) B, C, D
- (d) A, B, C

Answer:

(c) B, C, D







Question 27.

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

Answer:

(b) UAA, UAG, UGA

Question 28.

Amino acids which are specified by single codons are

- (a) phenylalanine and arginine
- (b) tryptophan and methionine
- (c) valine and proline
- (d) methionine and aroinine.

Answer:

(b) tryptophan and methionine

Question 29.

Which out of the following statements is incorrect?

- (a) Genetic code is ambiguous.
- (b) Genetic code is degenerate.
- (c) Genetic code is universal.
- (d) Genetic code is non-overlanning.

Answer:

(a) Genetic code is ambiguous.

Question 30.

Some amino acids are coded by more than one codon, hence the genetic code is

- (a) overlapping
- (b) degenerate
- (c) wobbled
- (d) unambiguous.

Answer:

(d) unambiguous.

Question 31.

The mutations that involve addition, deletion or substitution of a single pair in a gene are referred to as

- (a) point mutations
- (b) lethal mutations
- (c) silent mutations
- (d) retrogressive mutations.

Answer:

(a) point mutations

Question 32.

Sickle cell anemia results from a single base substitution in a gene, thus it is an example of

- (a) point mutation
- (b) frame-shift muttion





- (c) silent mutation
- (d) both (a) and (b).

(a) point mutation

Ouestion 33.

Select the incorreclty matched pair.

- (a) Initation codons AUG, GUG
- (b) Stop codons UAA, UAG, UGA
- (c) Methionine AUG
- (d) Anticodons mRNA

Answer:

(d) Anticodons - mRNA

Question 34.

Amino acid acceptor end of tRNA lies at

- (a) 5' end
- (b) 3' end
- (c) T VC loop
- (d) DHUloop.

Answer:

(b) 3' end

Ouestion 35.

Which RNA carries the amino acids from the amino acid pool to mRnA during protein synthesis ?

- (a) rRNA
- (b) mRNA
- (c) /RNA
- (d) hnRNA

Answer:

(c) /RNA

Question 36.

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)

Answer:

(b) discharging of/RNA

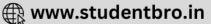
Question 37.

To prove that DNA is the genetic material, which radioactive isotopes were used by Hershey and Chase (1952) in experiments?

- (a) 33S and 15N
- (b) 32P and 35S
- (c) 32P and 15N
- (d) 14N and 15N







(d) 14N and 15N

Question 38.

RNA is the genetic material in

- (a) prokaryotes
- (b) eukaryotes
- (c) Tabacco Mosaic Virus (TMV)
- (d) E.coli.

Answer:

(c) Tabacco Mosaic Virus (TMV)

Question 39.

Which one among the following was the first genetic material?

- (a) DNA
- (b) RNA
- (c) Protein
- (d) Nuclein

Answer:

(b) RNA

Question 40.

Which of the following life processes is evolved around RNA?

- (a) Metabolism
- (b) Translation
- (c) Splicing
- (d) All of these

Answer:

(b) Translation

Ouestion 41.

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

Answer:

(c) (i) more, (ii) less

Question 42.

Which of the following phenomena was experimentally proved by Meselson and Stahl?

- (a) Transformation
- (b) Transduction
- (c) Semi-conservative DNA replication
- (d) Central dogma

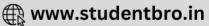
Answer:

(c) Semi-conservative DNA replication

Question 43.

First experimental proof for semi-conservative DNA replication was shown in





(a) Streptococcus pneumoniae(b) Escherichia coli(c) Neurospora crassa(d) Rattus rattus.Answer:(b) Escherichia coli
Question 44. Select the correct match of enzyme with its related function. (a) DNA polymerase – Synthesis of DNA strands (b) Helicase – Unwinding of DNA helix (c) Ligase – Joins together short DNA segments (d) All of these Answer: (d) All of these
Question 45. Other than DNA polymerase, which are the enzymes involved in DNA synthesis? (a) Topoisomerase (b) Helicase (c) RNA primase (d) All of these Answer: (d) All of these
Question 46. DNA replication takes place at phase of the cell cyle. (a) G_1 (b) S (c) G_2 (d) M Answer: (b) S
Question 47. 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 Answer: (b) transcription
Question 48. The enzyme DNA dependent RNA polymerase catalyses the polymerisation reaction indirection. (a) only $5' \rightarrow 3'$ (b) only $3' \rightarrow 5'$

CLICK HERE >>



- (c) both (a) and (b)
- (d) none of these

(a) only $5' \rightarrow 3'$

Question 49.

If the sequence of bases in coding strand of DNA is ATTCGATG, then the sequence of bases in mRNA will be

- (a) TAAGCTAC
- (b) UAAGCUAC
- (c) ATTCGATG
- (d) AUUCGAUG.

Answer:

(d) AUUCGAUG.

Question 50.

If the sequence of bases in DNA is GCTTAGGCAA then the sequence of bases in its transcript will be

- (a) GCTTAGGCAA
- (b) CGAATCCGTT
- (c) CGAAUCCGUU
- (d) AACGGAUUCG.

Answer:

(c) CGAAUCCGUU

Question 51.

Transcription unit

- (a) starts with TATA box
- (b) starts with pallendrous regions and ends with rho factor.
- (c) starts with promoter region and ends in terminator region
- (d) starts with CAAT region.

Answer:

(c) starts with promoter region and ends in terminator region

Question 52.

During transcription, the site of DNA molecule at which RNA polymerase binds is called

- (a) promoter
- (b) regulator
- (c) receptor
- (d) enhancer.

Answer:

(a) promoter

Question 53.

Polycistronic messenger RNA (mRNA) usually occurs in

- (a) bacteria
- (b) prokaryotes
- (c) eukaryotes
- (d) both (a) and (b)





(d) both (a) and (b)

Question 54.

In transcription in eukaryotes, heterogenous nuclear RNA (hnRNA) is tmascribed by

- (a) RNA polymerase I
- (b) RNA polymerase II
- (c) RNA poly merase II
- (d) all of these.

Answer:

(b) RNA polymerase II

Ouestion 55.

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

Answer:

(b) capping

Question 56.

In eukaryotes, the process of processing of primary transcript involves

- (a) removal of introns
- (b) capping at 5'end
- (c) tailing (polyadenlation) at 3' end
- (d) all of these.

Answer:

(b) capping at 5'end

Question 57.

In a n/RNA molecule, untranslated regions (UTRs) are present at

- (a) 5' end (before start codon)
- (b) 3' end (after stop codon)
- (c) both (a) and (b)
- (d) 3'- end only.

Answer:

(c) both (a) and (b)

Question 58.

UTRs are the untranslated regions present on

- (a) rRNA
- (b) hnRNA
- (c) mRNA
- (d) hnRNA.

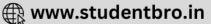
Answer:

(c) mRNA

Question 59.

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.

(b) Complete polypeptide is released from there.

Question 60.

Regulation of gene expression occurs at the level of

- (a) transcription
- (b) processing/splicing
- (c) translation
- (d) all of these.

Answer:

(d) all of these.

Ouestion 61.

During expression of an operon, RNA polymerase binds to

- (a) structural gene
- (b) regulator gene
- (c) operator
- (d) promoter.

Answer:

(d) promoter.

Question 62.

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 A, Lac A
- (d) Lac Z, Lac Y, Lac A

Answer:

(d) Lac Z, Lac Y, Lac A

Question 63.

Which of the following cannot act as inducer?

- (a) Glucose
- (b) Lactose
- (c) Galactos
- (d) Both (a) and (c)

Answer:

(d) Both (a) and (c)

Question 64.

Human genome consists of approximately

- (a) 3×10^9 bp
- (b) 6×10^9 bp
- (c) 20,000 25,000 bp
- (d) 2.2×10^4 bp.



(a) 3×10^9 bp

Question 65.

Estimated number of genes in human beings is

- (a) 3,000
- (b) 80,000
- (c) 20,500
- (d) 3×10^9

Target Series Objective Guide Science (English Medium)

Answer:

(c) 20,500

