

MOLECULAR BASIS OF INHERITANCE

SECTION - A



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DPP-11

- Haploid content of human DNA contains
 - 4.6×10^8 bp
 - 3.3×10^8 bp
 - 6.6×10^9 bp
 - 3.3×10^9 bp
- Which of the following nitrogenous bases are common for both RNA and DNA?
 - C, G, A
 - G, A, U
 - T, A, C
 - U, A, C
- Adjacent nucleotides in a polynucleotide chain are joined by
 - N-glycosidic bond
 - Phosphodiester bond
 - O-glycosidic bond
 - Hydrogen bond
- Sugars are attached to the pyrimidines by the formation of
 - Hydrogen bond
 - N-glycosidic bond
 - Phosphoester bond
 - O-glycosidic bond
- Cytidine is a
 - Nucleoside
 - Nitrogen base
 - Nucleotide
 - Common dinucleotide in DNA and RNA
- Which of the following process is related to reverse transcription?
 - DNA dependent DNA synthesis
 - RNA dependent DNA synthesis
 - DNA dependent RNA synthesis
 - RNA dependent polypeptide synthesis
- Which of the following structures are present in core particle of nucleosome?
 - Octamer of histone proteins
 - 200 bp of DNA
 - Non-histone proteins
 - Linker DNA
- Packaging of DNA helix
 - Involves polyamines in eukaryotes
 - Occurs with the help of NHC proteins only
 - Requires acidic proteins that help in coiling of DNA in prokaryotes
 - Is more complex in eukaryotes than prokaryotes
- Length of DNA in *E. coli* is
 - 2.2 m
 - 1.36 mm
 - 1.36 m
 - 3.4 m
- Which of the following radioactive isotopes were utilized for labeling protein and DNA in a transduction experiment respectively?
 - ^{32}P , ^{35}P
 - ^{35}S , ^{36}P
 - ^{35}S , ^{32}P
 - ^{32}S , ^{35}P
- Dominance of RNA world is proved by
 - Capping
 - Splicing
 - Polyadenylation
 - All of these
- Which plant was used by Taylor to prove semiconservative replication at chromosomal level?
 - Haematoxylin*
 - Vicia faba*
 - Trilium*
 - Ophioglossum*
- Unwinding of DNA creates tension which is released by enzyme
 - Helicase
 - Topoisomerase
 - Primase
 - Ligase
- During polymerisation of deoxyribonucleoside triphosphates in bacteria which of the following enzymes is mainly required?
 - DNA dependent RNA polymerase
 - DNA dependent DNA polymerase
 - RNA dependent DNA polymerase
 - DNA gyrase

1.(d), 2.(a), 3.(b), 4.(b), 5.(a), 6.(b), 7.(a), 8.(d), 9.(b), 10.(c), 11.(b), 12.(b), 13.(b), 14.(b), 15.(b), 16.(c)

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15. DNA polymerase catalyse polymerisation of / in
- a. Ribonucleotides
 - b. $5' \rightarrow 3'$ direction
 - c. $3' \rightarrow 5'$ direction
 - d. Deoxyribonucleosides
16. During DNA replication which of the following does not act as substrates?
- a. dATP
 - b. dCTP
 - c. dUTP
 - d. dGTP

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17. Out of the two strands of DNA one is carrying genetic information for transcription and it is called
- Coding strand
 - Non template strand
 - Sense strand
 - Template strand
18. When a mature mRNA was hybridised to its gene certain loops were observed. These loops represent
- Introns in DNA
 - Introns in rRNA
 - Exons in tRNA
 - Exons in DNA
19. Poly A tail is present in
- mRNA of bacteria
 - tRNA of eukaryotes
 - Promotor of bacteria
 - mRNA of eukaryotes
20. Find out the **incorrect** match.
- UUU - Phenylalanine
 - UAG - Sense codon
 - GUG - Valine
 - UGG - Tryptophan
21. One codon codes for only one amino acid, hence the code is
- Ambiguous and non-specific
 - Unambiguous and specific
 - Ambiguous and specific
 - Unambiguous and non-specific
22. What is **incorrect** for UTR?
- Present in between the translational unit in mRNA
 - Not recognised by any tRNA
 - Required for efficient translational process
 - Provide stability to mRNA
23. In bacteria, catalytic RNA is found in
- 60S subunit of ribosome
 - 50S subunit of ribosome
 - 30S subunit of ribosome
 - 40S subunit of ribosome
24. In *lac* operon, the regulator gene codes for
- Aporepressor
 - Corepressor
 - Inactive repressor
 - Active repressor
25. Mark the **incorrect** option w.r.t. *lac* operon
- Is under positive as well as negative control
 - Controls catabolic pathway
 - Shows feedback repression
 - Discovered by Jacob and Monod
26. In *lac* operon, the *lac* mRNA
- Has several initiation and termination codons
 - Forms four different enzymes
 - Is not transcribed in the presence of lactose
 - Is involved in an anabolic reaction
27. How many locations have been identified in human genome where single base differences occur?
- 1.4 million
 - 14 million
 - 1.4 billion
 - 14 billion
28. What is **incorrect** for human chromosome 1?
- It is one of the largest chromosome
 - Its sequence was completed in May 2007
 - It has maximum number of genes
 - It was the last chromosome to be sequenced

17.(d), 18.(a), 19.(d), 20.(b), 21.(b), 22.(a), 23.(b), 24.(d), 25.(c), 26.(a), 27.(a), 28.(b)

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29. The non-human model organisms sequenced in Human Genome project were
- A nematode and fruit fly
 - Wheat and rice
 - Fish and birds
 - Garden pea and fruit fly
30. Mark the **correct** one (w.r.t. Application of DNA fingerprinting)
- Forensic science
 - Determining the population diversity
 - Determining the genetic diversity
 - More than one option is correct
31. In the technique of DNA fingerprinting digestion of DNA is followed by
- Electrophoresis
 - Hybridisation
 - Denaturation
 - Southern blotting
32. In eukaryotes, RNA polymerase III catalyses the synthesis of
- 5 S rRNA, tRNA & SnRNA
 - mRNA, HnRNA & SnRNA
 - 28 S rRNA, 18 S rRNA & 5 S rRNA
33. Read the following statements:
- Variation at genetic level arises due to mutations.
 - Technique of DNA fingerprinting was initially developed by Alec Jeffreys
- Only (B) is correct
 - Both (A) and (B) are correct
 - Only (A) is correct
 - Both (A) and (B) are incorrect
34. In DNA fingerprinting, detection of hybridised DNA fragments is possible by
- Electrophoresis
 - Blotting
 - Autoradiography
 - Centrifugation
35. Mark the **correct** match.
- | | | | |
|----------------------|-------------|---|--|
| a. Catalytic RNA | in bacteria | - | 16 S rRNA and 23 S |
| b. <i>Val</i> operon | | - | Found in eukaryotes |
| c. Sanger method | | - | Determination of amino acid sequences in proteins only |
| d. VNTR | | - | Intron |