

SECTION A

Multiple Choice Questions

[1X 10=10]

1. **Statement I:** In an experiment conducted by Avery et al, the transforming substance was not a protein or RNA.
Statement II: In experiment conducted by Avery et al, the proteases and RNases do not affect transformation.
- A. Both statements I and II are correct and II explains I
B. Both statements I and II are correct and II does not explain I
C. Statement I is true and statement II is false
D. Both statements I and II are false
2. **Statement I:** Chromosome 1 has 231 genes and the Y has 2968 genes.
Statement II: Repetitive sequences of DNA are thought to have direct coding function and shed light on chromosome structure, dynamics and evolution.
- A. Only statement I is correct
B. Only statement II is correct
C. Both statements I and II are correct
D. Both statements I and II are incorrect
3. **Statement I:** The relationship between genes and DNA are best understood by mutation studies.
Statement II: Frame shift mutation forms the genetic basis of proof that codon is a triplet and it is read in a contiguous manner.
- A. Only statement I is correct
B. Only statement II is correct
C. Both statements I and II are correct
D. Both statements I and II are incorrect
4. Blood stain component to be used for DNA profiling technique is
- A. Serum B. Leucocytes C. Platelets D. Erythrocytes
5. Which of the following events would occur in 'Lac-operon of E. coli when growth medium has high concentration of lactose?
- A. Structural genes fail to produce polycistronic mRNA
B. Repressor protein binds to RNA polymerase and prevents translation
C. Repressor protein attaches to the promoter sequence and represses the operator
D. Inducer molecule binds to repressor protein and RNA polymerase binds to promoter sequence.
6. Which of the following has no tRNA?
- A. UAU B. UAA C. UGU D. UGG
7. The tRNA takes part in
- A. Transfer of genetic code to cytoplasm
B. Carry amino acids to ribosomes
C. Collection of RNA in ribosome
D. Copy the genetic code from DNA in nucleus



8. In ATG ACC AGG ACC CCA ACA sequence the first base gets mutated. It will effect
- A. Change in type and sequence of amino acids
 - B. Change in first amino acid only
 - C. No change
 - D. No coding

9. Aminoacylation of tRNA is essential for

- A. Replication of RNA
- B. Formation of peptide bond
- C. Splicing
- D. Initiation of transcription

10. Opal is

- A. UGA
- B. UAG
- C. UAA
- D. UUU

SECTION – B

[2X3= 6]

11. What do you understand by semi-conservative DNA replication ? Who proved it ?

12. Mention the structural & chemical differences bw RNA & DNA.

13. Diagrammatically [only] represent the Hershey-Chase experiment.

SECTION-C

[3X 3= 9]

14. Define Operon. Explain lac Operon.

15. Name the contributors & their contributions that led to the proposition of genetic code that could direct the sequence of amino acids during protein synthesis.

16. Mention the machinery & enzymes require for the process of DNA Replication along with the functions.

SECTION-D

[5X1= 5]

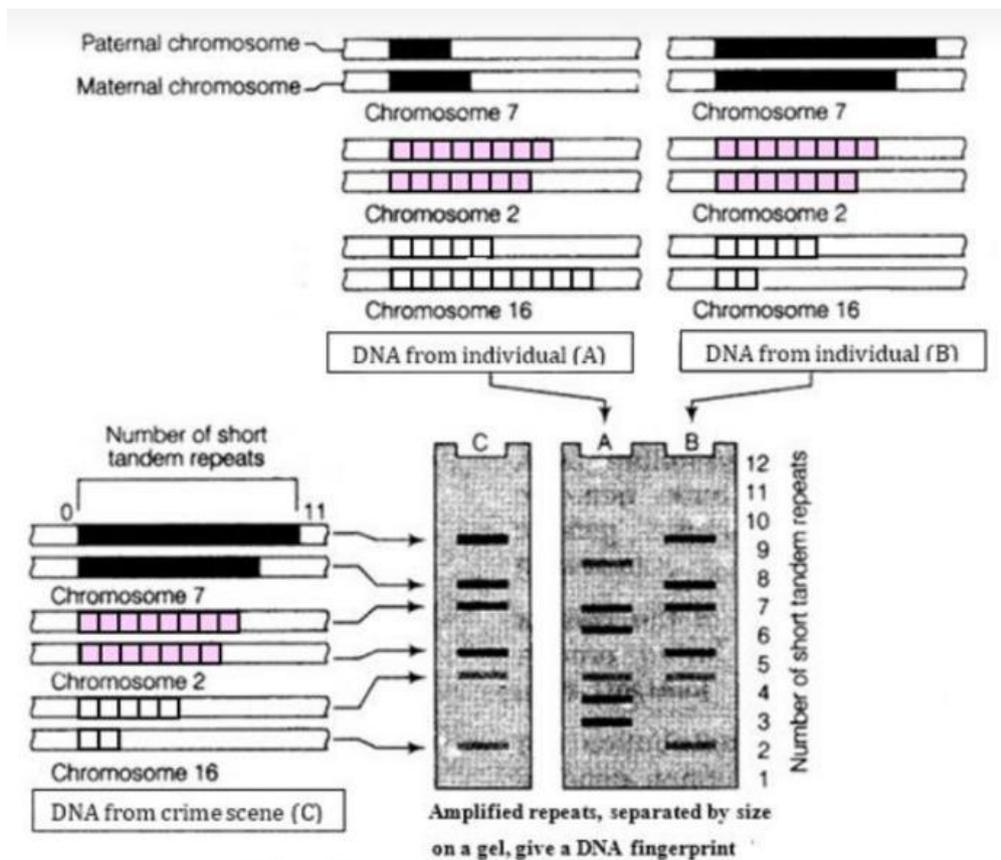
17. Explain the process of translation . Support your answer with appropriate diagrams.

CASE STUDY

[1X5= 5]

18. Two blood samples of suspects 'A' and 'B' were sent to the Forensic Department along with sample 'C' from the crime scene. The Forensic Department was assigned the responsibility of running the samples and matching the samples of the suspects with that of the sample from the scene of the crime and thereby identifying the culprit.





Q1: In genetic fingerprinting, the 'probe' refers to –

1. A radioactively labelled double stranded RNA molecule.
2. A radioactively labelled double stranded DNA molecule.
3. A radioactively labelled single stranded DNA molecule.
4. A radioactively labelled single stranded RNA molecule.

Q2: What does 'minisatellite' and 'microsatellite' mean in relation to DNA Fingerprinting?

Q3: How does polymorphism arise in a population?

Q4: State the steps involved in DNA Fingerprinting in a sequential manner.

Q5: What forms the basis of DNA Fingerprinting ?

