

BYJU'S Study Planner for Board Term I (CBSE Grade 12)

Date: 19/11/2021

Subject: Biology

Topic : Molecular Basis of
Inheritance

Class: Standard XII

1. Removal of introns and joining the exons in a defined order in a transcription unit is called:
 - A. Tailing
 - B. Transformation
 - C. Capping
 - D. Splicing
2. All of the following are found in prokaryotic mRNA except
 - A. AUG
 - B. UGA codon
 - C. introns
 - D. uracil
3. If the sequence of the coding strand in a transcription unit is written as follows
5'-TGAAGTGTAGCATGC-3'.
Find out the correct sequence of the m-RNA transcribed from it.
 - A. 5'-UGAACUGUAGCAUGC-3'
 - B. 3'-CGUACGAUGACAAGU-5'
 - C. 3'-CGUACGAUGUCAAGU-5'
 - D. 5'-UGACUGUAGCUUGC-3'

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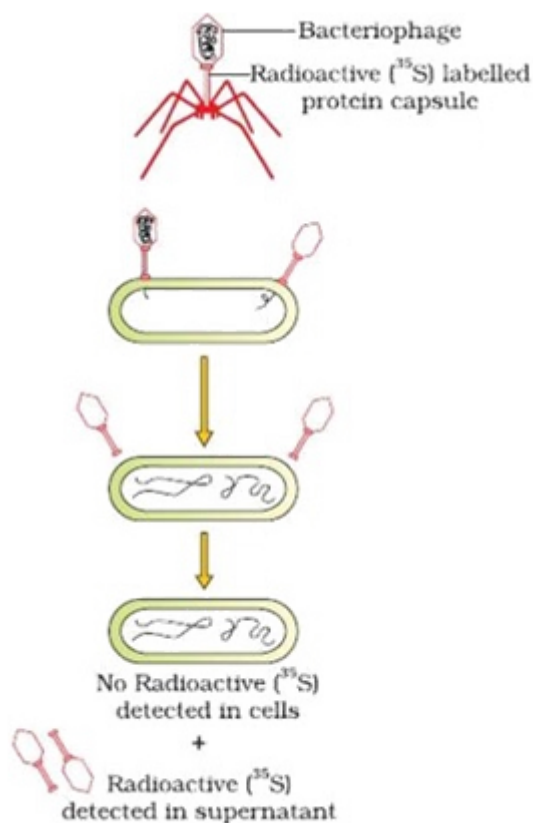
4. Polycistronic mRNA is characteristic of:
- A. Prokaryotes
 - B. Eukaryotes
 - C. Both a and b
 - D. Viruses
5. *Lac* operon has
- A. Y genes
 - B. Z genes
 - C. A genes
 - D. all the above
6. Which of the following is true of RNA synthesis (transcription)?
- A. RNA synthesis is always in the 5' - 3' direction
 - B. RNA polymerase needs a primer to initiate transcription
 - C. In transcription, U is inserted opposite T
 - D. New nucleotides are added on to the 2' OH of the ribose sugar
7. Constitutive genes are those genes which are active
- A. during developmental stages
 - B. during differentiation stages
 - C. throughout lifetime
 - D. at a particular stage of life

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8. In a DNA segment, 10 N₂ bases are present. How many sugar molecules are present in this segment?
- A. 5
 - B. 10
 - C. 15
 - D. 20
9. A double stranded DNA molecule with 6390 base pairs long will have the following number of turns:
- A. 639
 - B. 63.9
 - C. 6.39
 - D. 31.95

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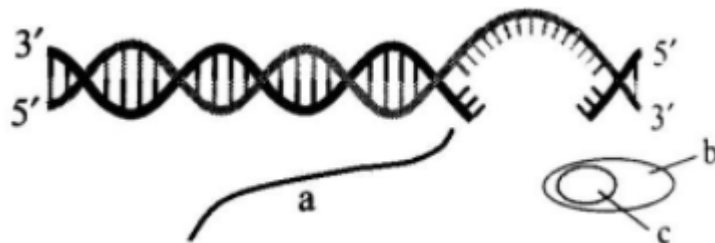
10. *E.coli* was infected with bacteriophage having radioactive (S^{35}) protein in a culture. It was blended, centrifuged and distribution of S^{35} determined. What does the experiment show?



- A. Protein is not the genetic material
- B. *DNA* is not involved in heredity
- C. Nothing is proved
- D. *DNA* is the genetic material

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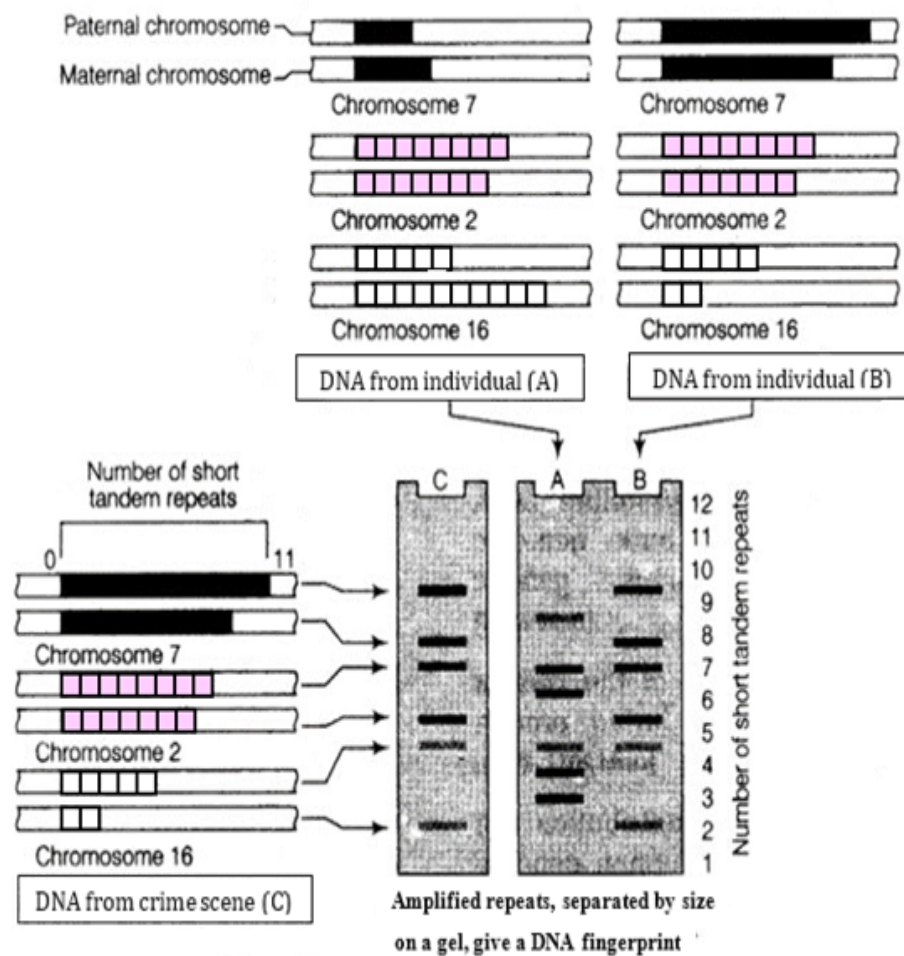
11. The given figure represents the process of transcription in bacteria.



- A.** a – DNA, b – RNA, c – Promoter
- B.** a – RNA, b – RNA~polymerase, c – Rho factor
- C.** a – RNA, b – RNA~polymerase, c – Sigma~ factor
- D.** a – DNA, b – DNA~polymerase, c – RNA

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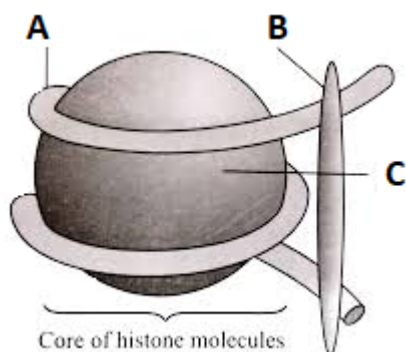
12. In the schematic representation, few representative chromosomes have been shown containing different copy number of VNTR. Which of the following individual is criminal on the behalf of this?



- A. Individual 'A'
- B. Individual 'B'
- C. Can't be predicated
- D. Neither 'A' nor 'B', any other individual

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13. The given figure shows the structure of nucleosomes with their parts labelled as A, B and C. Identify A, B and C.



- A.** A – DNA; B – H1 histone; C – Histone octamer
- B.** A – H1 histone; B – DNA; C – Histone octamer
- C.** A – Histone octamer; B – RNA; C – H1 histone
- D.** A – RNA; B – H1 histone; C – Histone octamer
14. Assertion (A): In eukaryotes, both introns and exons are transcribed to form hnRNA.

Reason (R): The exons are removed to make the final transcript by splicing.

- A.** Both assertion and reason are true and reason is the correct explanation of assertion
- B.** Both assertion and reason are true but reason is not the correct explanation of assertion
- C.** Assertion is true but the reason is false
- D.** Both assertion and reason are false

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15. Assertion: In eukaryotes, replication and transcription occur in the nucleus but translation takes place in the cytoplasm.

Reason: mRNA is transferred from the nucleus into cytoplasm where ribosomes and amino acids are available for protein synthesis.

- A. Both assertion and reason are true and reason is the correct explanation of assertion
 - B. Both assertion and reason are true but reason is not the correct explanation of assertion
 - C. Assertion is true but reason is false
 - D. Both assertion and reason are false
16. A biologist isolated a gene from a human cell, attached it to a plasmid and inserted the plasmid into a bacterium. The bacterium made a new protein, but it was nothing like the protein normally produced in a human cell. Why?
- A. The gene contained introns
 - B. The gene did not have sticky ends
 - C. The biologist should have cloned the gene
 - D. The bacterium had undergone a transformation
17. During analysis of the *DNA* of an organism having 5386 nucleotides find out $A = 29\%$, $G = 17\%$, $C = 32\%$, $T = 17\%$. Considering the Chargaff's rule, it can be concluded that:
- A. It is double-stranded linear *DNA*
 - B. It is double-stranded circular *DNA*
 - C. It is single-stranded *DNA*
 - D. Both a and b

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18. In the biochemical characterisation of the transforming principle, it was found that the process of transformation is not affected by which of the following enzymes?

- A. DNase
- B. RNase
- C. Peptidase
- D. Lipase

A. A, B, D

B. A, C, D

C. B, C, D

D. A, B, C

19. Which result is false according to Griffith's experiment?

A. S Strain → Mice die

B. R strain → Mice live

C. S Strain → Mice live
(Heat killed)

D. S Strain + R Strain → Mice live
(Heat killed) (Live)

20. Match the type of RNA in column I with its function in column II.

Column I	Column II
1. mRNA	A. reads the genetic code
2. tRNA	B. catalytic role
3. rRNA	C. acts as a template

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

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

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

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