# MOLECULAR BASIS OF INHERITANCE

**SECTION - B**

MY E-GURU
mye-guru.com

SAFALTA.COM
An Initiative by अमर उजाला

## Biology By Mahesh Sir DPP-12

1. If the sequence of one strand of DNA is 5' A T G C A T C G 3', find the sequence of complementary strand in 5' → 3' direction
   a. T A C G T A G C
   b. C G A T G C A T
   c. A T G C A T C G
   d. A T C G T A C G
2. NHC structural proteins are
   a. Basic proteins rich in lysine, arginine
   b. Regulatory proteins
   c. Catalytic proteins rich in tryptophan and arginine
   d. Required for packaging of chromatin at higher levels
3. How many types of DNA polymerases are present in bacteria?
   a. Five b. Three c. Two d. One
4. Synthesis of leading and lagging strand require
   a. Single primer
   b. Single and many primers respectively
   c. Many and single primers respectively
   d. Many primers
5. For the strand separation and stabilization during DNA replication which of the following set of enzymes and proteins are required?
   a. SSBP, gyrase, primase
   b. Topoisomerase, Helicase, ligase
   c. Gyrase, ligase, primase
   d. Topoisomerase, Helicase, SSBP
6. In eukaryotes, the RNA polymerase that synthesizes tRNA is RNA polymerase _____ and is also responsible for formation of _____ rRNA.
   a. II, 5.8 S
   b. I, 5 S
   c. III, 5 S
   d. II, 18 S
7. What is **correct** for bacterial transcription?
   a. mRNA requires processing to become active
   b. Translation can begin when mRNA is fully transcribed
   c. Transcription and translation takes place in the same compartment
   d. Rho factor initiates the process
8. Which of the following is not required during post transcriptional processing in eukaryotes?
   a. Methyl guanosine triphosphate
   b. Ligase
   c. ScRNA
   d. SnRNA
9. Which of the following feature is **correct** for bacteria?
   a. Presence of intervening sequences in DNA
   b. DNA does not show coiling
   c. Linear ss-DNA representing single chromosome
   d. DNA can be chromosomal as well as extrachromosomal
10. *In-vitro* template independent RNA synthesis is a feature of
    a. RNA polymerase
    b. Reverse transiptase
    c. Ochoa enzyme
    d. DNA polymerase
11. In protein synthesis, which of the following are required for the synthesis of charged tRNA?
    a. Amino acid, GTP, initiation codon, ribosome
    b. Amino acid, ATP, $Mg^{++}$, enzyme, tRNA
    c. Amino acid, ATP, $K^{++}$, enzyme, mRNA
    d. Aminoacyl tRNA, ribosome, initiation codon, release factor
12. Termination of polypeptide synthesis in bacteria differs from eukaryotes in
    a. Having different termination codons

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

**SECTION - B**

b. Being GTP dependent
c. Involving more than one type of release factors
d. All of these

13. The accessibility of promoter regions of bacterial DNA in many cases regulated by the interaction of proteins with sequences termed
    a. Regulators
    b. Structural genes
    c. Inhibitor genes
    d. Operators
14. When the genomes of two people are cut using the same restriction enzyme, the length and number of fragments obtained are different, this is called
    a. PCR
    b. RFLP
    c. EST
    d. Northern blotting
15. Which of the following does not code for any proteins?
    a. Micro-satellites
    b. Exons
    c. Mini-satellites
    d. More than one option is correct
16. Which statement is correct for homeotic genes?
    a. Control is exerted through homeodomain proteins
    b. Mutation in these genes not results in conversion of one body part into another
    c. Such genes have been studied extensively in humans
    d. Control oncogenesis process
17. In which step of DNA profiling, nitrocellulose membrane is used?
    a. Denaturation
    b. Autoradiography
    c. Blotting
    d. DNA amplification
18. Repressor of lac-operon
    a. Is a tetrameric protein
    b. Having a molecular weight of 16, 000
    c. Has only one side
    d. Is made by operator gene
19. Select the correct one (w.r.t. Wobble hypothesis)
    a. Third base of a codon lacks vibrating capacity
    b. Third base can establish H-bonds even with the non complementary anticodon
    c. Specificity of a anticodon is particularly determined by first two codon
    d. Major cause of degeneracy is the first two N-bases of codon
20. A set of genes or cDNA is immobilized on a glass slide and used in transciptome studies is called
    a. Proteome
    b. Microarray
    c. DNA chip
    d. Genome
21. Which of the following bond is not present in DNA?
    a. β – 1' – 9 – N-glycosidic bond
    b. 3' – 5' Phosphodiester bond
    c. β – 1' – 1 – N-glycosidic bond
    d. β – 1' – 2 – N-glycosidic bond
22. If there are 81 million bases in RNA of human cell, then calculate the total number of Introns present in cDNA
    a. 27 millions
    b. Zero
    c. Equal to ribonucleotides
    d. Half the number of ribonucleotides
23. Splicing is necessary for preparing a mature transcript and its movement to cytoplasm. It requires
    a. scRNA and proteins
    b. snRNA and proteins
    c. scRNA and snRNA
    d. scRNA only
24. Majority of unusual bases are found in tRNA, TΨC loop is
    a. First loop from 5' –end of tRNA
    b. AA – tRNA synthetase binding loop
    c. Ribosomal binding loop
    d. Nodoc site
25. How many amino acids will be coded by the mRNA sequence – 5'CCCUCAUAGUCAUAC3' if a adenosine residue is inserted after $12^{th}$ nucleotide?
    a. Five amino acids
    b. Six amino acids

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

**SECTION - B**

c. Two amino acids
d. Three amino acids

26. Identification and binding of RNA polymerase to the promoter sequence is a function of
a. Rho factor
b. Sigma factor
c. Beta factor
d. Omega factor

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

# MOLECULAR BASIS OF INHERITANCE

## SECTION - B

27. Repetitive sequences are stretches of DNA with repeated bases many times in a genome, but
    A. These sequences are of no transcriptional function
    B. These are associated with euchromatin region
    C. These helps to identify a person on the basis of its DNA specificity
    a. All are correct
    b. Only B is incorrect
    c. Both A and B are correct
    d. Both B and C are incorrect
28. The microsatellites have simple sequences of repeated
    a. 11-60 bp
    b. 1-6 bp
    c. 10 bp
    d. 50 bp
29. The DNA strand showing replication using Okazaki fragments also shows
    a. Continuous growth in 5' → 3' direction
    b. Discontinuous growth on 5' → 3' parental strand
    c. Discontinous gwoth on 3' → 5' parental strand
    d. Involvement of one primer only
30. Prokaryotic transcription mechanism requires involvement of only one polymerase type and
    A. It occurs in cytoplasm only
    B. It is often coupled with translation
    C. It does not require splicing but capping is essential
    a. All are correct
    b. Both B and C are incorrect
    c. Both A and C are correct
    d. Only C is incorrect
31. Pribnow box is a consensus of _____ bases, forming a binding site for *E. coli* RNA polymerase at promotor
    a. TATAAT
    b. AGGAGG
    c. CAAT
    d. GC
32. In tryptophan operon
    a. Non-proteinaceous aporepressor is synthesized by R-gene
    b. Normally chorismic acid is not converted into tryptophan
    c. Repression is mostly connected with a catabolic pathway
    d. Enzymes produced by structural genes normally present in the cell
33. In tailing, adenylate residures are added at 3' end
    a. With the help of gyanyl transferase
    b. In a template independent manner
    c. With the help of methyl transferase
    d. Of hn-RNA of *E. coli*
34. For every single amino acid incorporated in peptide chain _____ ATP and _____ GTP molecules are used
    a. 1, 4
    b. 1, 6
    c. 1, 2
    d. 1, 3
35. In t-RNA
    a. CCA – OH is present at 5-end
    b. TΨC loop for attaching the amino acid
    c. DHU loop for binding with AA – activating enzyme
    d. There are three recognition sites

27.(b), 28.(b), 29.(c), 30.(d), 31.(a), 32.(d), 33.(b), 34.(c), 35.(c)