

# Shagaf

## Molecular Bio Mid

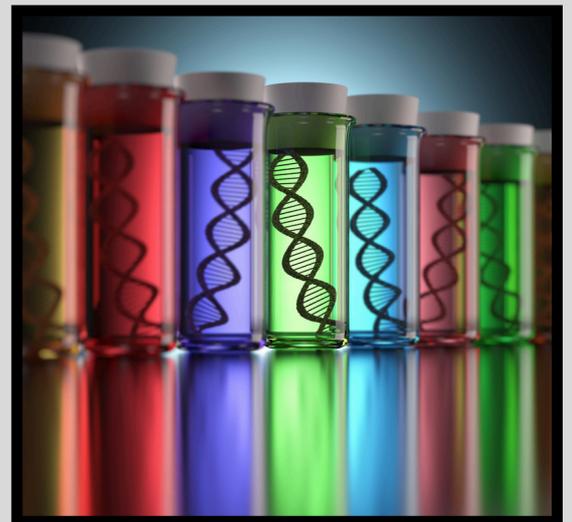
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**Q1. What is the estimated frequency of genetically determined disease is about**

- A) 1% – 2%**
- B) 2.5% – 3.5%**
- C) 3.5% – 5%**
- D) 5.5% – 7%**

**Ans : c**

**Q2. Which of the following statements about DNA is incorrect?**

- A) DNA is a double helix.**
- B) The distance between adjacent nucleotides is 34 Å.**
- C) DNA strands run in an antiparallel direction.**
- D) The bases in DNA are adenine, thymine, cytosine, and guanine.**

**Ans : B**

**Q3. How does uracil (U) differ from thymine (T)?**

- A) Uracil has an additional hydroxyl group.**
- B) Thymine has an additional phosphate group.**
- C) Uracil lacks a methyl group at the carbon 5 position.**
- D) Thymine has an extra nitrogen atom.**

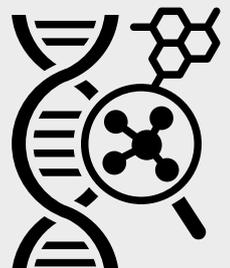
**Ans : c**

**Q4. Deoxydenosine : has sugar**

**Q5. Which of the following statements about DNA is correct?**

- A) The distance between adjacent nucleotides is 34 Å.**
- B) DNA strands are parallel to each other.**
- C) The bond is always between purines and pyrimidines.**
- D) Uracil is present in DNA instead of thymine.**

**Ans : c**



**Q6. Which of the following statements about the phosphate group in nucleic acids is incorrect?**

- A) The phosphate group is part of the backbone of DNA and RNA.**
- B) The phosphate group is involved in forming phosphodiester bonds.**
- C) The third hydroxyl group binds to the sugar to form a phosphodiester bond.**
- D) Phosphodiester bonds link the 5' carbon of one sugar to the 3' carbon of the next sugar.**

**Ans : c**

**Q7. Which of the following statements about the hydrogen bonding between guanine and cytosine is correct?**

- A) The NH group of guanine forms a hydrogen bond with the N3 position of cytosine.**
- B) The NH group of guanine forms a hydrogen bond with the N1 position of cytosine.**
- C) The NH group of guanine forms a hydrogen bond with the O2 position of cytosine.**
- D) The NH group of guanine forms a hydrogen bond with the C5 position of cytosine.**

**Ans : A**

**Q8. Which of the following statements about the helix–turn–helix motif is incorrect?**

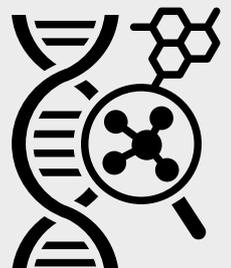
- A) It consists of two  $\alpha$ -helices connected by a short turn.**
- B) It is commonly found in DNA-binding proteins.**
- C) It consists of parallel  $\beta$ -sheets.**
- D) It is involved in the recognition and binding of specific DNA sequences.**

**Ans : c**

**Q9. Which of the following statements about the zinc finger motif is incorrect?**

- A) The nucleotide recognition signal is contained within a helix and  $\beta$ -sheet.**
- B) Zinc ions are essential for the structural stability of zinc fingers.**
- C) Zinc finger motifs are exclusively composed of  $\alpha$ -helices.**
- D) Zinc finger motifs can bind to DNA, RNA, or proteins.**

**Ans : c**



**Q10. Which of the following statements about mitochondrial DNA (mtDNA) is incorrect?**

- A) mtDNA lacks exons.**
- B) mtDNA is circular in structure.**
- C) mtDNA encodes essential proteins for mitochondrial function.**
- D) mtDNA is inherited maternally.**

**Ans : A**

**Q11. The end of chromosomes is**

- A. Telomere**
- B. Telomerase**

**Ans : A**

**Q13. What is the typical sequence of telomeres in humans?**

- A) ATCGAT**
- B) GCGCGC**
- C) TTAGGG**
- D) AACCAA**

**Ans : c**

**Q14. Karyotyping nomenclature 47,XX,+21**

**Is it?**

- A. female with one extra chromosome at 21 (dawn syndrome)**
- B. Male with one extra chromosome at 21 (dawn syndrome)**
- C. Female with one missing chromosome at 21 ( dawn syndrome)**

**Ans : A**

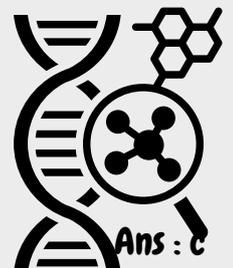
**Q15. Which term describes the duplication of a chromosome segment that is located immediately adjacent to the original segment on the same chromosome?**

- A) Translocation**
- B) Tandem duplication**
- C) Inversion**
- D) Deletion**

**Ans : B**

**Q16. Which genetic syndrome is characterized by the following features: mental deficiency, deafness, cleft lip, and cardiac anomalies?**

- A) Down syndrome**
- B) Turner syndrome**
- C) Patau syndrome**
- D) Klinefelter syndrome**



**Ans : c**

**Q17. What is the function of sliding clamp ?**

**bind DNA polymerase at the DNA strand and prevent dissociating**

**Q18. Which enzyme is primarily responsible for removing the RNA primer during DNA replication?**

- A. DNA polymerase III**
- B. DNA ligase**
- C. Helicase**
- D. RNase H**

**Ans : D**

**Q19. Which transcription factor is responsible for targeting RNA polymerase II to the promoter during transcription initiation?**

- A. TFIIA**
- B. TFIIB**
- C. TFIIF**
- D. TFIIH**

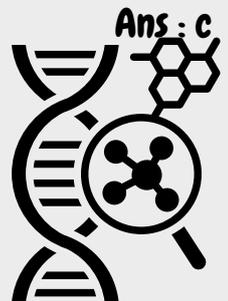
**Ans : c**

**Q20. Which subunit of prokaryotic RNA polymerase is primarily responsible for the initiation of transcription by recognizing and binding to promoter regions?** اجت نفس فكرة

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- A. Alpha ( $\alpha$ ) subunit**
- B. Beta ( $\beta$ ) subunit**
- C. Sigma ( $\sigma$ ) factor**
- D. Omega ( $\omega$ ) subunit**

**Ans : c**



# Lab questions

**Q1. DNA can be extracted from all of the following except:**

- A. Skin cells
- B. White blood cells (WBCs)
- C. Hair follicles
- D. Red blood cells (RBCs)

Ans : D

**Q2. All of the following statements are incorrect except:**

- A. Miniprep kits are used for extracting large quantities of plasmid DNA (100–350  $\mu\text{g}$ ).
- B. Midiprep kits are used for extracting small quantities of plasmid DNA (1–20  $\mu\text{g}$ ).
- C. Midiprep kits are used for extracting medium quantities of plasmid DNA (100–350  $\mu\text{g}$ ).
- D. Maxiprep kits are used for extracting small quantities of plasmid DNA (1–20  $\mu\text{g}$ ).

Ans : C

**Q3. Which of the following outlines the correct principle of DNA extraction?**

- A. Cell lysis, protection, purification
- B. Cell lysis, denaturation, replication
- C. Protection, purification, transcription
- D. Replication, cell lysis, purification

Ans : A

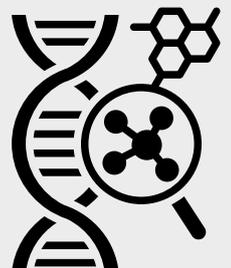
**Q4. All of the following is correct except?**

Milli Q water is deionized water to remove DNA or RNA segments

**Q5. The interaction of DNA with silica in extraction protocols primarily depends on:**

- A. The hydrophobic interactions between DNA and silica.
- B. The positive charge of the silica surface.
- C. The negative charge of DNA's phosphate backbone.

Ans: C



# Lab questions

Q6. All of the following correct about features of automated magnetic beads mode except ? centrifuge is necessary and important

Q7. If the OD (0.2) and the dilution factor (10) , calculate the yield of 50 microl

- A. 5000 ng
- B. 500ng
- C. 5ng

Q8. A 260/280 ratio of 1.7 in a nucleic acid sample most likely indicates:

- A. High purity of nucleic acids
- B. Contamination with proteins
- C. Contamination with RNA
- D. Insufficient sample concentration

Ans : B

Q9. What is the primary function of Ethidium bromide in molecular biology?

- A. Inhibiting DNA replication
- B. Breaking down RNA molecules
- C. Visualizing DNA under UV light
- D. Enhancing PCR amplification

Ans : c

Q10. The .....is a technique used to find the integrity of DNA & the ..... is an instrument used to find the purity

Ans : Electrophoresis&Nanodrop

