**Problem Set-2**

1. The mechanism of DNA replication is

(A) conservative (B) dispersive

(C) semi-conservative (D) all of the above

2. State TRUE or FALSE for the following statements:

(A) Leading strand are synthesized from 5’ to 3’ direction

(B) Lagging strand are synthesized from 3’ to 5’ direction

(C) Okazaki fragments are observed during lagging strand synthesis

(D) Lagging strand requires more primers than leading strand during replication

3. State TRUE or FALSE for the following statements regarding DNA gel electrophoresis:

(A) DNA is negatively charged, hence migrates towards the positive terminal in the applied electric field gradient

(B) Different DNA molecules separate according to mass/size/length

(C) Smaller DNA molecules migrate faster

(D) DNA is visualized by staining with ethidium bromide, which fluoresces under UV light

4. During DNA replication, helicase enzyme unwinds the double stranded DNA to produce localized single stranded DNA. In a PCR reaction, we use an alternative mechanism for DNA unwinding. What is that?

(A) A special buffer with high salt concentration (B) High temperature

(C) A special DNA polymerase that can denature DNA (D) Very low pH

5. DNA ligase is required during DNA replication for

(A) Sealing the gaps between newly synthesized DNA fragments

(B) Synthesis of Okazaki fragments

(C) Stabilizing single stranded DNA

(D) Sealing the gaps between RNA primers and newly synthesized DNA

6. Which sugar is found in RNA?

(A) Deoxyribose (B) Pentose (C) Fructose (D) Lactose

7. Metal ions such as Mg2+, Na+ typically interact with the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ group of DNA.

(A) sugar (B) nitrogenous base (C) hydroxyl (D) phosphate

8. If you run 35 cycles of PCR, by what factor does the target sequence theoretically increase?

9. **In order to conclude a forensic investigation using DNA sample, a forensic lab must have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ facilities.**