**Problem Set-2**

1. The accepted mechanism for DNA replication is

(A) conservative mechanism (B) dispersive mechanism

**(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 **TRUE**

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

(C) Okazaki fragments are observed during lagging strand synthesis **TRUE**

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

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 **TRUE**

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

(C) Smaller DNA molecules migrate faster **TRUE**

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

4. RNA is chemically less stable than DNA, because of

(A) the uracil base instead of the thymine **(B) the presence of the 2’-OH group**

(C) the extra carbon atom (D) all of the above

5. Ligase enzyme 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. Suppose we assign numerical values to each nucleotide base as follows:

(A) A: 0; (B) T: 1; (C) G: 2; (D) C: 3

In that case, the DNA sequence 5’-TATA-3’ will have a numerical value of 68 (in base 10).

(A) Convert the following DNA sequences to their numerical values:

5’-TCCGAT-3’ **→ 1332014 = 201710**

5’-TGCAAT-3’ **→1230014  = 172910**

(B) Convert the following binary code to a DNA sequence:

10110000000110010110 → **5’-GCAAATGTTG- 3’**

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