**Science – 2 – Spring 2025**

**In – Class Test**

**Question 1**

The DNA strand used as a template for DNA replication is **3′ TACCGATTGCA 5′**. Which of the following DNA strands will be created from this template strand?

a. **5′ TGCAATGCCTA 3′**  
b. **5′ TAGGCATTGCA 3′**  
c. **5′ AUGGCUAACGU 3′**  
d. **5′ ATGGCTAACGT 3′** ✅

**Question 2**

In a sample of double-stranded DNA, 10% of the nitrogenous bases are guanine (G). What percentage of the nitrogenous bases in the sample are adenine (A)?

a. **80%**  
b. **40%** ✅  
c. **90%**  
d. **10%**

**Question 3**

Which of the following is **not** a difference between DNA and RNA?

a. **DNA contains alternating sugar-phosphate molecules, whereas RNA does not contain sugar.** ✅  
b. **DNA contains deoxyribose and RNA contains ribose.**  
c. **RNA is single-stranded and DNA is double-stranded.**  
d. **DNA contains thymine, whereas RNA contains uracil.**

**Question 4**

Template-dependent nucleotide polymerization is carried out by:

a. **Both DNA and RNA polymerases** ✅  
b. **Only RNA polymerase**  
c. **Only DNA polymerase**

**Question 5**

We have thousands of SARS-CoV-2 genome sequences available in the database. What advantage is gained by re-sequencing the viral genome?

a. **Identify strain-specific mutations for drug/vaccine development.**  
b. **All of the above.** ✅  
c. **Understand its migration pattern.**  
d. **Understand how the virus is evolving.**

**Question 6**

Many antibiotics interfere with the transfer of genetic information from RNA to protein, preventing bacteria from growing. Which of the following processes is affected by antibiotics?

a. **Transcription**  
b. **Replication**  
c. **Translation** ✅  
d. **Transmission**

**Question 7**

Based on the presence of which of the following cell structures would you claim that the cell is a **eukaryotic cell**?

a. **Cytoplasm**  
b. **DNA**  
c. **Ribosomes**  
d. **Nucleus** ✅

**Question 8**

The recognition site for Sau3A I is **GATC** and is contained in the recognition site of BamH I, **GGATCC**. The number of fragments generated by the two restriction enzymes will be:

a. **Same**  
b. **More for Sau3AI** ✅  
c. **More for BamHI**

**Question 9**

If the length of sequence read is **100 bases**, and **10× coverage** is desired, the number of reads required to sequence a human genome (**3 × 10⁹ bases long**) is:

a. **3 × 10⁷**  
b. **3 × 10⁸** ✅  
c. **3 × 10¹⁰**  
d. **3 × 10⁹**

**Question 10**

One of Darwin’s observations during his trip to the Galápagos Islands was **“species can adapt to the changing environment”**. Is this statement:

a. **True** ✅  
b. **False**

**Question 11**

Which type of information-carrying biopolymer evolved first?

a. **DNA**  
b. **RNA** ✅  
c. **Proteins**  
d. **Both DNA and RNA evolved simultaneously.**

**Question 12**

Which of the following DNA strands would have been the template to produce the RNA strand: **5′ AAA AUG AGU AAG 3′**?

a. **3′ UUU TAC UCA UUC 5′**  
b. **3′ AAA ATG AGT AAG 5′**  
c. **3′ TTT TAC TCA TTC 5′** ✅  
d. **3′ TTT TAC TCA TTC 5′** ✅