**Multiple Choice.** Select the best answer. (2 marks each)

1 . Replication refers to the synthesis of:

1. ATP
2. DNA
3. bacteria
4. BGH

2. What modifications are necessary to rewrite the following DNA strand as an RNA strand?

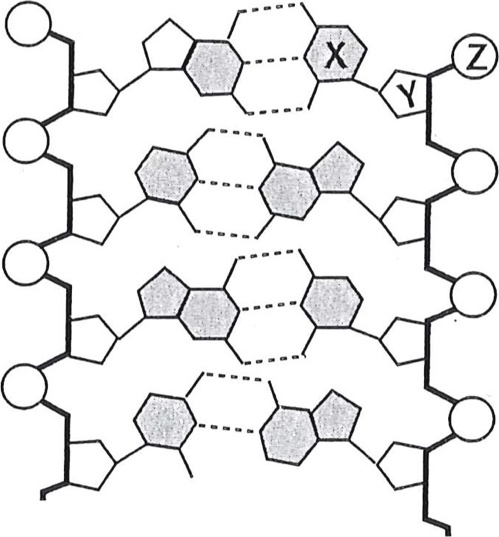
DNA strand: GGCATPGCA

1. CCGUAACGU
2. GGCAUUGCU

### C. CCGTUUGCA

D. GGCUAACGU

Use the following diagram to answer questions 3 to 6:

3. The structure labelled X is a

1. base
2. deoxyribose sugar
3. phosphate group
4. nucleotide

4. The structure labelled Y is a

1. base
2. deoxyribose sugar
3. phosphate group
4. nucleotide
5. Z represents a
   1. base
   2. deoxyribose sugar
   3. phosphate group
   4. nucleotide
6. Taken together, structures X, Y, and Z represent a
   1. base
   2. deoxyribose sugar
   3. phosphate group
   4. nucleotide
7. Which of the following can be produced using recombinant DNA techniques?
   1. testosterone
   2. glycogen
   3. insulin
   4. cholesterol

**Short Answer:**

1. Describe the structure of DNA. Include the components of a nucleotide, the types of bonds found between bases, and complementary base pairs. You may choose to draw and label a diagram. (5 marks)
2. Identify and **describe** in detail the three steps involved in DNA replication. Use the enzymes: topoisomerase, ligase, RNA primase, and DNA polymerase in your explanations. (5 marks)
3. Identify three differences between the structures of RNA and DNA. (5 marks)

4.Label the diagram below with the terms: *DNA helicase, DNA polymerase, RNA Primase, topoisomerase, Okazaki fragment, ligase, daughter strand, complimentary strand, lagging strand, leading strand, chromatin, chromatid, chromosome, centromere, nitrogenous base pairs, DNA sugar-phosphate backbone, H-bond*

