

BA SANGAM COLLEGE

YEAR 13

BIOLOGY

WORKSHEET 4

STRAND 1

STRUCTURE AND LIFE PROCESSES

1. DNA was extracted from the cells of a rabbit and analysed. The table below shows the percentage abundance of each base in the DNA extract.

Guanine	Adenine	Cytosine	Thymine
20%	X%	Y%	Z%

The percentage abundance of Thymine base in the DNA extract is

- A. 20%
- B. 30%
- C. 40%
- D. 60%

2. The retention/accuracy/preservation of information passed from one generation to another in a given population is most dependent on the accuracy of the

- A. sequence of bases copied.
- B. number of molecules produced.
- C. action of the polymerase enzyme.
- D. time it takes for new proteins to be made.

3. Which one of the structures in the nucleus named below prevents fraying and attack by DNA hydrolysing enzymes to the chromosomes?

- A. histone
- B. telomere
- C. centromere
- D. nucleosome

4. Which of the following sets of compounds would differentiate a RNA nucleotide from a DNA nucleotide ?

- A. uracil, cytosine, adenine, guanine
- B. phosphate, deoxyribose sugar, uracil
- C. phosphate, ribose sugar, uracil, guanine, thymine
- D. phosphate, deoxyribose sugar, adenine, uracil, guanine

5. When a lens is said to have a resolving power of $0.4\mu\text{m}$, it means that the lens

- A. has a magnifying power of 0.4.
- B. can magnify objects up to $0.4\mu\text{m}$.
- C. cannot differentiate objects more than $0.4\mu\text{m}$ apart.
- D. cannot differentiate objects less than $0.4\mu\text{m}$ apart.

6. DNA is able to replicate itself to form two identical molecules.

(a) Give the purpose of DNA replication.

(b) Give the function of the following chemicals in DNA replication:

(i) Helicase

(ii) DNA polymerase

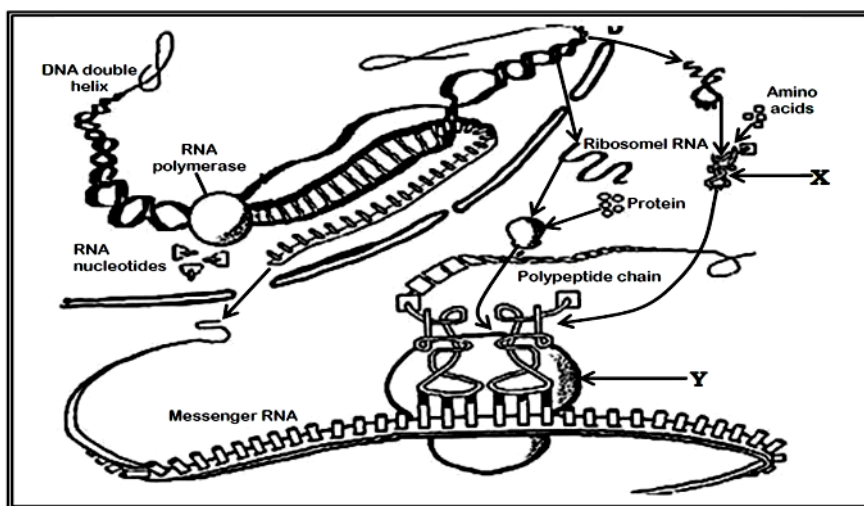
(iii) Ligase

(iv) Okazaki fragments

7. A cell is able to accurately replicate DNA so that there is less than one mistake per billion nucleotides added to the growing chains. Explain how this accuracy is possible.

8. Discuss **two** ways in which the process of DNA Replication ensures that each daughter cell receives a complete set of DNA.

9. Study the diagram of protein synthesis outlined below and answers the questions that follow.



(i) Identify the structures labelled X and Y.

(ii) In which region of the cell do the processes of transcription and translation occur?

(iii) The base sequence on the codon that codes for the amino acid proline is **CCU**. Write the complementary base sequence on the DNA molecule.

(iv) Why is the process of DNA replication known as a semi-conservative process?

(v) Briefly describe the assembly of bases on the lagging strand.

10. Discuss **three** other roles of proteins in the body besides their role as a catalyst.

11. Long Essay

(a) Define the term **Lac Operon Theory**.

Discuss the following processes of protein synthesis:

(i) Lac Operon Theory and its significance to procaryotes.

(ii) translation in eucaryotes

THE END