

Name: _____

Q.1

Part (a) deals with DNA structure and replication.

- (a) (i) Name the base in DNA that pairs with cytosine.
 (ii) What are the two main events in the replication of DNA? (9)

Part (b) deals with protein synthesis.

- (b) (i) Explain the terms *transcription* and *translation*.
 (ii) In which structures in the cell does translation occur?
 (iii) How many bases in sequence make up a codon in mRNA?
 (iv) Each mRNA codon specifies one of three possible outcomes during protein synthesis. Name these **three** possible outcomes.
 (v) What does the letter 't' stand for in tRNA?
 (vi) During translation one end of a tRNA molecule attaches to an mRNA codon. What is usually attached to the other end of the tRNA molecule? (27)

- (c) (i) Explain, in terms of what happens to body cells, what is meant by the term *cancer*.
 (ii) Give **two** possible causes of cancer.
 (iii) Some people choose to be screened to determine their risk of getting a particular type of cancer. What is meant by genetic screening?
 (iv) Blood samples taken from a crime scene were put through a process called DNA profiling. During the process cells were broken down to release the DNA, which was then cut into fragments. The fragments were then separated.
 1. What was used to cut the DNA?
 2. On what basis were the DNA fragments separated?
 3. Give an application of DNA profiling other than solving crime.
 (v) The following are the results of the DNA profiling process. Using these results, identify which suspect, **A**, **B** or **C** committed the crime.

| <u>Crime Scene</u> | <u>Victim</u> | <u>Suspect A</u> | <u>Suspect B</u> | <u>Suspect C</u> |
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(27)

Q.2

- (i) DNA is made of units called nucleotides. Draw a labelled diagram of a nucleotide to show its three constituent parts. (6)
- (ii) Which of the labelled parts in your diagram in (i) may vary from nucleotide to nucleotide? (3)
- (iii) The genetic code is contained within the DNA of chromosomes. Briefly describe the nature of this code. (3)
- (iv) What is meant by non-coding DNA? (3)
- (v) Give **one** structural difference between DNA and RNA. (3)
- (vi) Name a cell organelle, apart from the nucleus, in which DNA is found. (3)

Q.3

- (i) What plant did you use? (3)
- (ii) It is usual to chop the tissue and place it in a blender. Suggest a reason for this. (3)
- (iii) For how long should the blender be allowed to run? (3)
- (iv) Washing-up liquid is normally used in this experiment. What is its function? (3)
- (v) Sodium chloride (salt) is also used. Explain why. (3)
- (vi) What is a protease enzyme? (3)
- (vii) Why is a protease enzyme used in this experiment? (3)
- (viii) The final separation of the DNA involves the use of alcohol (ethanol). Under what condition is the alcohol used? (3)