

2024 Bi H1 Q3

Section: DNA and the Genome

Topic: Polymerase Chain Reaction (PCR)

Question Summary:

During PCR, repeated cycles of heating and cooling are used to amplify a region of DNA. The question asks which row in the table correctly identifies the events taking place at 72°C and 55°C.

Worked Solution:

- PCR involves three key temperature steps in each cycle.

1. Around 94–96°C: DNA strands separate (denaturation).
2. Around 55°C: primers bind (anneal) to target sequences on the single DNA strands.
3. Around 72°C: DNA polymerase extends from the primers, replicating the DNA region (extension).

Therefore, at 72°C DNA polymerase replicates the DNA region, and at 55°C primers bind to target sequences.

Final Answer: **D** (DNA polymerase replicates the region of DNA; primers bind to target sequences).

Revision Tips:

- PCR = Denaturation (94–96°C), Annealing (55°C), Extension (72°C).

- DNA polymerase used is thermostable (Taq polymerase) so it can function at high temperatures.
- Primers define the region of DNA that will be amplified.