1. Gram staining is a technique used to distinguish between gram-positive and gram-negative bacteria.

   Which of the options, **A** to **D**, is correct?

   A gram-positive bacteria stain blue / purple, gram-negative bacteria do not stain
   B gram-positive bacteria stain blue / purple, gram-negative bacteria stain pink / red
   C gram-positive bacteria stain pink / red, gram-negative bacteria do not stain
   D gram-positive bacteria stain pink / red, gram-negative bacteria stain blue / purple

   Your answer [ ]

   [1]

2. A population of *Escherichia coli* was grown in the laboratory from a single cell.

   In a laboratory, *E. coli* divides once every 15 minutes.

   Which of the options, **A** to **D**, is the theoretical size of the *E. coli* population after 2 hours?

   A   8 cells
   B   16 cells
   C   225 cells
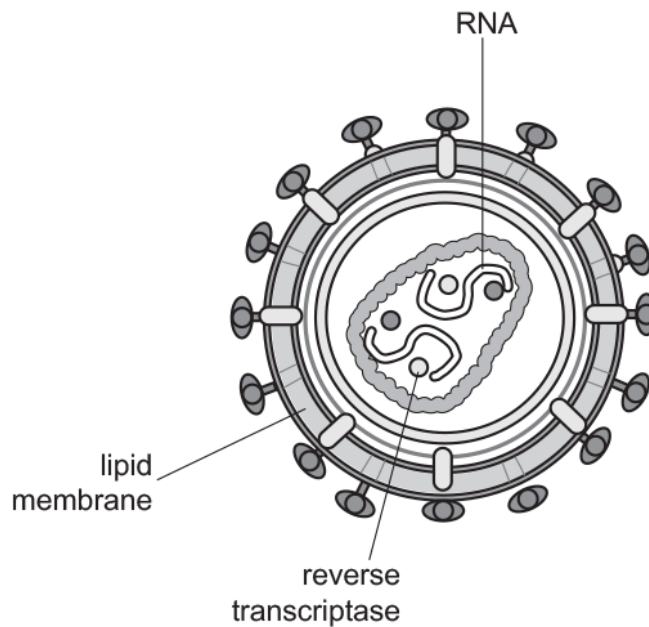   D   256 cells

   Your answer [ ]

   [1]

3. Which of the options, **A** to **D**, could cause a genetic bottleneck?

   A   disease epidemic
   B   habitat conservation
   C   intensive farming
   D   species extinction

   Your answer [ ]

   [1]

4.   The diagram shows a type of pathogen that can cause disease in humans.

RNA

lipid
membrane

reverse
transcriptase

Which of the statements, **A** to **D**, correctly describes its mechanism of pathogenicity?

A   damages host cells by using them to make its own proteins rather than host protein

B   produces agglutinins that clump host cells together

C   secretes enzymes that enable it to spread through host tissues

D   produces antibodies against host cells

Your answer   **[1]**

5. 15 cases of thyroid cancer were recorded in Iceland between December 2009 and January 2011.

The graph below shows, for each case, the month of diagnosis (▲) and month of recovery (▼) or death (**X**) from the disease.
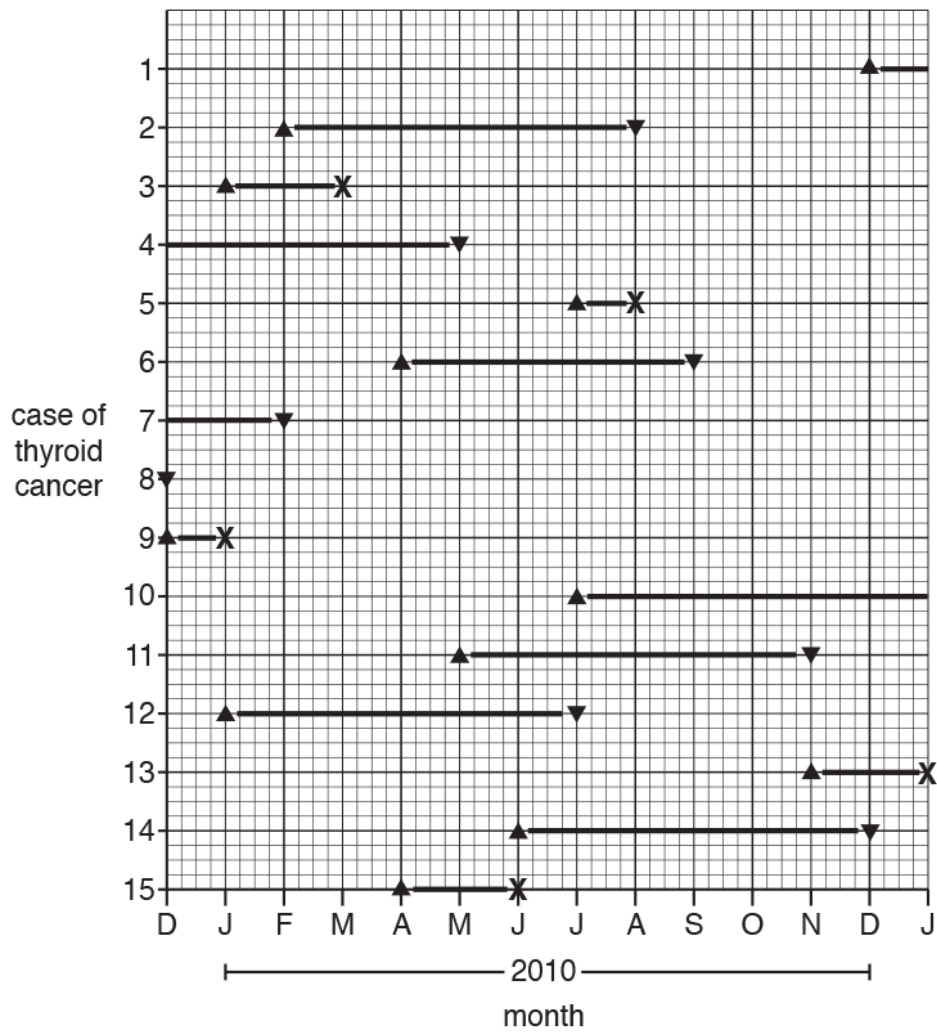
Iceland has a population of 330 000 people.

Which of the options, **A** to **D**, was the incidence rate (per 100 000) of thyroid cancer in 2010?

A 2.1

B 2.7

C 3.3

D 4.2

Your answer [ ] [1]

END OF QUESTION PAPER

Mark Scheme

Question			Answer/Indicative content	Marks	Guidance
1			B	1	
			Total	**1**	
2			D ✓	1	
			Total	**1**	
3			A ✓	1	
			Total	**1**	
4			A	1	
			Total	**1**	
5			C	1	
			Total	**1**	