1. Cancer is a non-communicable disease.

(i) Describe what causes cancer.

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[2]

(ii) Identify **one** factor that could increase a person's risk of developing cancer.

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[1]

(iii) In the past it has been estimated that 1 in 3 people will develop cancer in their lifetime.

Recent estimates suggest the ratio is 1 in 2.

The UK population is 65 640 000.

If the **recent estimate** is correct, how many people can be expected to develop cancer?

Give your answer to **2** significant figures.

Number of people = ... **[2]**

(iv) Suggest why the figure calculated in **(iii)** will be an estimation.

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[1]

2. Plants can be infected by diseases caused by pathogens.

The plant disease ash dieback was first recorded in the early 1990s in Poland.

Since then, many thousands of trees in northern Europe have become infected.

Ash dieback was first found in eastern parts of Great Britain (GB) in 2012, and has been spreading across the country ever since.

Suggest **two** ways in which ash dieback could have been spread from mainland Europe to Great Britain.

1 ----------

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2 ----------

---------- [2]

END OF QUESTION PAPER

Question			Answer/Indicative content	Marks	Guidance
1		i	**Any two from:** changes to DNA/genes ✓ uncontrollable cell division/ rapidly dividing cells/ cell divides many times by mitosis ✓ creates a tumour ✓	2 (AO 1.1 x 2)	**ALLOW** mutation of DNA/genes <u>Examiner's Comments</u> Most candidates scored well on this question, but it was noted that very few candidates referred to mitosis when stating 'uncontrollable cell division'. Terminology used could also be improved upon, many candidates used terms such as cells reproducing, replicating or duplicating rather than dividing. Those that did not score on this question often did so for referring to risk factors such as smoking or for referring to cell growth.
		ii	**Any one from:** obesity ✓ family history / inherited allele(s)/variant(s)/ gene mutation✓ smoking ✓ human papilloma virus / HPV ✓ carcinogens ✓ ionising radiation / UV / sunlight ✓	1 (AO 1.1)	**ALLOW** examples of carcinogens, e.g. asbestos, radon gas, alcohol **ALLOW** examples of ionising radiation, e.g. ultraviolet/UV/sunlight, X-rays, gamma rays
		iii	**FIRST CHECK ANSWER ON ANSWER LINE** **If answer = 33000000 / 33 & 10^6 award 2 marks** 65640000 / 2 or 32,820000 ✓ **= 33000000 / 33 × 10^6 ✓**	2 (AO 2.2) (AO 1.2)	**ALLOW** 33 million for 2 marks ALLOW an incorrect answer to 2 sig figs

Question			Answer/Indicative content	Marks	Guidance
		iv	**Any one from:** because the original figures are an estimate/only given to 2 sig figs ✓ change of exposure to risk factors ✓ life expectancy increase/ could die before you get cancer✓	1 (AO 2.1)	**ALLOW** any valid suggestion Examiner's Comments Many candidates gained both marks for the calculation in 5 (a) (iii), those that did not score 2 marks generally scored 1 mark for either using the correct ratio (1 in 2) to determine the number or for using the wrong ratio (1 in 3) but presenting the number to two significant figures. Many candidates then utilised the idea that this number would be an estimate of the number of people who would develop cancer and took it through to 5 (a) (iv). It would be helpful if centres could discuss with candidates why figures such as this are an estimation as very few candidates suggested that there could be a change to risk factors. Those candidates that did attempt to answer this question in this way often missed the mark for stating there could be lifestyle changes without qualifying what this could be. Candidates were not given credit for this answer as only some lifestyle changes would affect numbers.
			Total	6	
2			(fungal spores) carried by the wind ✓ import/movement of material from infected ash trees ✓	2 (AO 2.1 × 2)	**ALLOW** (spores) carried on the back//body/legs of insects **ALLOW** trees/saplings/cuttings/seeds/soil/wood Examiner's Comments Many candidates recognised that spores could be carried in the air or infected material could be imported into the country.
			Total	2	