Read **Text A**, and then answer **Questions 1(a)–1(e)** on the question paper.

Text A: Project Mammoth

This text is an article about a new scientific project.

Of all the incredible possibilities presented by controversial new scientific techniques, perhaps the most intriguing are efforts to bring animals back from extinction. Candidates for 'de-extinction', as the process is known, include species like the passenger pigeon (the last one died in captivity in 1914) and the dodo (last seen in 1662).

These projects are not just distant dreams.

Scientists working on such projects estimate that a variation of the first new woolly mammoth (which disappeared some 4 000 years ago) may soon be born. They hope these animals will play a role in slowing or reversing the effects of climate change.

The basic idea behind how it would work is that scientists would first retrieve DNA from the remains of a woolly mammoth that had been preserved for centuries in the frozen tundra[1] and use that to alter the DNA of modern Asian elephants. According to scientists, the two species are so closely related that if mammoths were alive today they could successfully breed with elephants. Tweaking the Asian elephants' DNA to more closely resemble that of their ancient relatives could mean elephants might be able to give birth to a furrier, fattier hybrid.

Scientists say this work is decidedly not about creating Mammoth Park – the creature would not be a perfect copy of a mammoth anyway. The hope is that these mammoth-like Asian elephants will be more resistant to cold and will repopulate the tundra and coniferous forest in Eurasia and North America. Scientists feel that this will help to protect endangered Asian elephants and revive an ancient grassland in the tundra, which could prevent the melting of Siberia's permafrost.

The project is not without its critics who claim the idea is no more than a gimmick, seducing scientists into thinking they are saving the world and distracting us from guaranteeing our planet's biodiversity for future generations with promises of being able to fix mistakes later.

Scientists defending the idea explain, 'We're just bringing DNA back from the past to improve modern survival and diversity. The Asian elephant faces threats to its existence – it's going extinct, just like the mammoth did, and mainly because of humans. Bits of mammoth DNA can give them a better chance of survival.'

[1] **tundra**: a vast treeless plain in the Arctic where the subsoil is permanently frozen

Read **Text A**, ***Project Mammoth***, in the insert and then answer **Questions 1(a)–(e)** on this question paper.

Question 1

(a) Give **two** examples of extinct species (other than the mammoth) according to the text.

- .....
- ..... [1]

(b) **Using your own words**, explain what the text means by:

(i) 'candidates for "de-extinction"' (line 2): .....

..... [2]

(ii) 'not just distant dreams.' (line 5): .....

..... [2]

(c) Re-read paragraph 3, ('Scientists working on such projects … climate change.').

Give **two** reasons why scientists might be excited by the possible birth of a woolly mammoth.

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

(d) Re-read paragraphs 4 and 5, ('The basic idea … Siberia's permafrost.').

(i) Identify **two** main tasks that scientists will need to complete in order to breed the hybrid.

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

(ii) Explain why Asian elephants were chosen for Project Mammoth.

.....

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..... [3]

(e) Re-read paragraphs 6 and 7, ('The project is not without ... chance of survival.').

Using your own words, explain why some people disagree with Project Mammoth.

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..... [3]