Cambridge Assessment International Education

Cambridge International AS Level

ENGLISH GENERAL PAPER **8021/21**

Paper 2 Comprehension **May/June 2020**

INSERT **1 hour 45 minutes**

INFORMATION

- This insert contains all the resources referred to in the questions.
- You may annotate this insert and use the blank spaces for planning. **Do not write your answers** on the insert.

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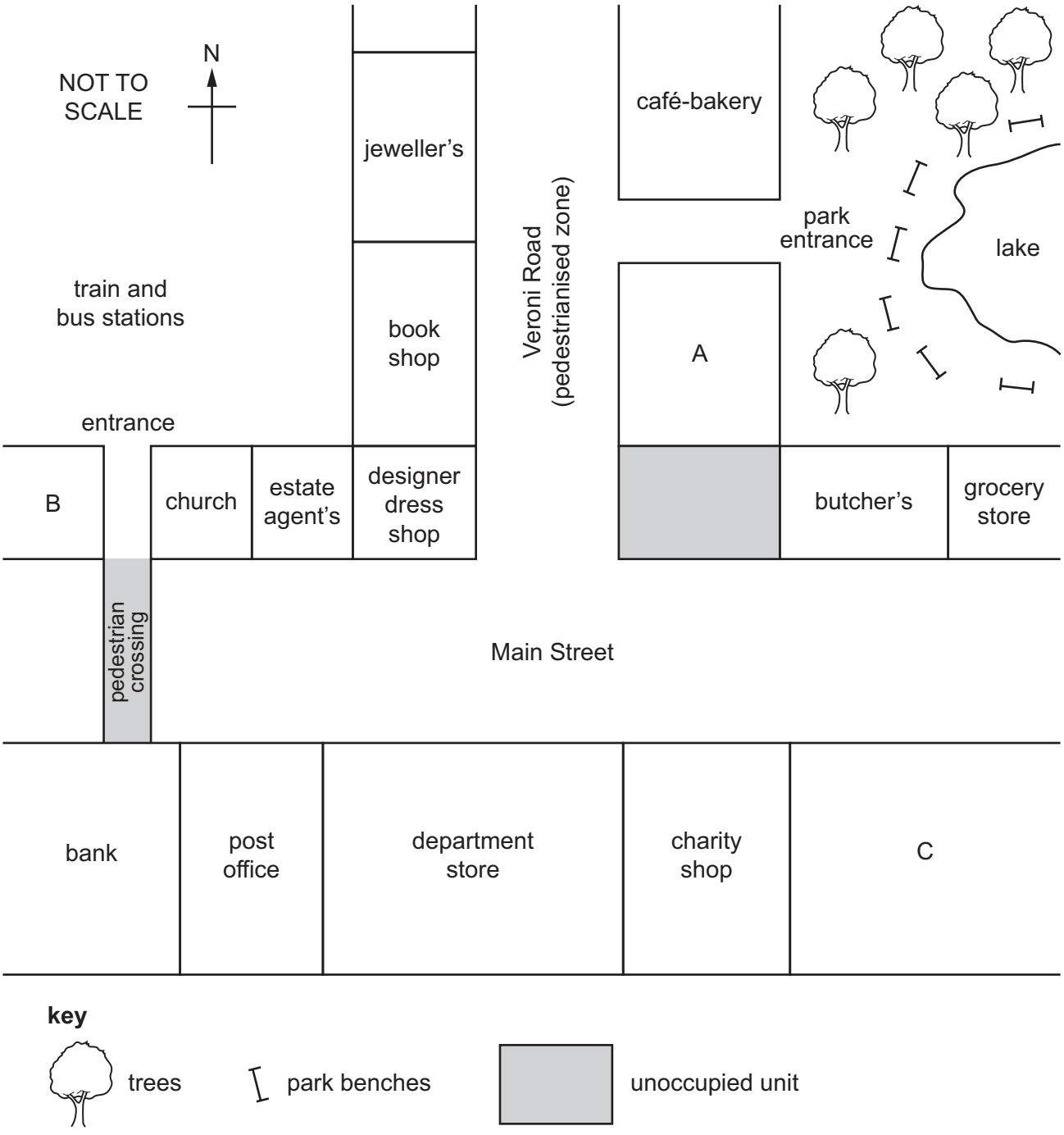
Material for Section A

Background

Over the past six months, Luco has been so successful running a cake-making business from his kitchen that he is now looking to rent a retail unit in the centre of Zere, his local town, in order to grow his business. Thanks to Zere Town Council's recent positive strategies, put in place to attract more people to the town centre, the town is not reflecting the national trend of shop closures but seeing retailers starting to thrive again. This has given Luco the incentive to take a risk and make a big financial investment in the future of his burgeoning business.

The plan below of Zere town centre shows the locations of the three retail units (A, B and C) that Luco is currently considering.



Additional information

1. Up until now, Luco has been selling his products, such as cupcakes and brownies, mostly at farmers' markets, music festivals and pop-up cultural events, as well as online. From the public reaction so far, he knows that they would make an eye-catching and sophisticated display in a shop window.
2. A recent study carried out in Zere has revealed that 65 per cent of consumers polled prefer to buy products from retailers who have both a permanent physical presence and an online one.
3. The landlord of retail unit A will charge $8000 per month. The minimum rental period is a year. Discounts of up to 25 per cent are available for a tenant who upgrades the premises in any way.
4. In addition, in the not-too-distant future, Luco would like to branch out into providing his upmarket cakes for weddings, parties, corporate gift-giving, etc., and, if possible, into selling quality cooking utensils and equipment to maximise the upselling potential of his shop.
5. The landlady of retail unit B will charge $3000 per month for the first year, then the rent will increase in line with the rate of inflation. The minimum rental period is three years.
6. Unit A is 1500m², unit B is 800m² and unit C is 3000m².
7. The town council is offering generous grants to any business in Zere taking on a young person as an apprentice.
8. Zere Town Park has won the award for being the best-kept park in the country for the last two years – ever since the council cleaned out the lake and planted hundreds of trees.
9. The landlord of retail unit C will charge a discounted rent of $10 000 per month for the first year. The minimum rental period is two years.
10. Until a month ago, unit C was a restaurant, charging prices in the mid-range for its meals.
11. The café-bakery offers baked goods priced at the cheapest end of the market.
12. There is free car parking along the Main Street for half an hour, but only on the north side.
13. The unit on the corner of Veroni Road and the Main Street has been unoccupied for two years.
14. Luco is very environmentally aware and so, to get to work, he cycles or uses public transport (e.g. buses and trains) as often as he can.
15. The charity shop, which sells second-hand goods to raise money for the local hospital, still cannot afford to replace a broken pane of glass in its shop window, so it remains boarded up.
16. Initially, Luco is hoping to create one full-time post and one part-time post with this planned expansion of his business.
17. Having checked over Luco's business plan, his bank has agreed to loan him $100 000.
18. Unit A underwent a deep clean before being made available to rent.

Material for Section B

A magazine article by Emma Young

The Hot Zone

Deep in the western Amazon lies the Yasuni National Park. Packed within an average hectare of this dense, steamy rainforest are more species of tree than are native to the US and Canada combined, as well as 150 types of amphibian and an estimated 100 000 insect species. According to recent research there are more different life forms in Yasuni than anywhere else in South America. 'It's hard to get very far, because every few minutes you see or hear something new,' says Matt Finer, staff ecologist at Save America's Forests. Yasuni may well be the most biodiverse place in the World.

If Yasuni does indeed hold this title, its tropical location will come as no surprise to biologists. The tropics boast more than ten times as many species of animal and plant as the Arctic, with diversity decreasing steadily as you approach the poles. This gradient* holds true for both land and the ocean depths. The big question is why? What is it about the tropics that so fosters biodiversity? It is a mystery that has puzzled biologists for decades. Yasuni might help us find an answer.

According to one classic theory, the reason is that there is more habitable space around the Equator than at the poles. On the face of it, this seems to make sense. The tropics encompass an area nearly five times the size of the Earth's polar regions, and there is evidence that habitable space is correlated with the number of species on land. Research in the ocean tells a different story, however.

David Jablonski, of the University of Chicago, and his colleagues are involved in a long-term study of living and fossil marine bivalves, a group including oysters and mussels. Looking at present-day biodiversity patterns in 4000 bivalve species, they have found no relationship between habitable area and the number of bivalve species. 'Habitable area just doesn't explain marine biodiversity gradients,' Jablonski says.

Perhaps biodiversity at sea and on land are governed by different rules. The traditional explanation for patterns of marine biodiversity is known as Rapoport's rule. The idea here is that ocean-dwelling species in the tropics are very sensitive to temperature, so are restricted to small ranges where the water is just right, whereas species in cooler waters can tolerate a broader range of temperatures so spread out. This could explain why large numbers of species are packed together in the tropics, but it doesn't seem to hold consistently. 'There are more exceptions to this rule than strong examples,' says Jablonski, 'which means it's not much of a rule.'

So what are the alternatives? Some researchers have argued that speciation** rates, both terrestrial and marine, could be much higher in the tropics, making them a 'cradle' of biodiversity. Others have suggested that extinction rates are the decisive factor, with species less likely to become extinct near the Equator than at higher latitudes, making the tropics a 'museum' of biodiversity.

To tease out these alternatives, Jablonski and his colleagues focused on three key factors: the rate at which species have evolved in any given location, the local extinction rate, and the immigration rate of new species. They found that three-quarters of marine bivalve genera*** existing today evolved in the tropics then spread out towards the poles, while also remaining in their original habitat. So the tropics are a cradle of biodiversity. But that's not all. There are also a number of old genera in the tropics,

indicating extinction rates are lower in the tropics than in temperate (cooler) regions. So the tropics are also a museum of biodiversity. The team concluded that their findings support an 'out of the tropics' theory to explain decreasing diversity towards the poles. Since then, a few other teams have found more evidence that the tropics are both a cradle and a museum of biodiversity.

Not all research backs the idea, though. In 2009 Martin Buzas of the Smithsonian Institution and Stephen Culver of East Carolina University published a study of all 259 species of single-celled, seabed-dwelling animals living along the Atlantic coast of North America. They found not only that equal numbers of these originated in tropical and temperate regions, but that three-quarters of the species that had evolved at higher latitudes were now also found in the tropics. These results are very interesting, says Jablonski, although he points out the Caribbean underwent a major extinction event between 2 and 3 million years ago, which might at least partly account for Buzas's findings.

If the tropics are indeed the 'engine' of biodiversity, with more species evolving here than anywhere else, why could this be? Shane Wright of the University of Auckland has a possible explanation. He compared the genes of 45 common tropical plants with those of plants from cooler regions, and found the tropical species had more than twice the rate of molecular evolution. Warmer temperatures could increase metabolic rates and rates of DNA replication, Wright suggests. This would raise the mutation rate, which, via natural selection, would lead to a proliferation of new species.

The idea has its detractors, however. 'I don't think DNA replication rates are driving speciation,' says Stuart Pimm at Duke University. 'If it were just temperature, then deserts would have more species.' He also points out that marine diversity varies considerably within equatorial regions.

Nevertheless, warmer temperatures may at least be important for sustaining biodiversity by providing plenty of energy to fuel crowded ecosystems. This seems to be the case in Yasuni National Park.

*The rate of change.

** The formation of new and distinct species in the course of evolution.

*** The plural of genus. A category used in biological classification that is below a family and above a species level.

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