Reading
Answer ALL questions

Case Study 1
Bringing scents to the metaverse.

Read the text and answer the questions below.

1

It was one of those many inventions that never quite took off. In 1960, audiences watching the film “Scent of Mystery” got to experience the wonders of “Smell-O-Vision”. The system was placed under the cinema seats and it pumped out 30 different scents - from salty ocean breezes to scents of fruit - at crucial moments in the plot. The system had its faults. Those in the balcony complained that the smells reached them too late. Others found the scents to be too faint, or else irritatingly persistent. More novel than effective, Smell-O-Vision never really took root in Hollywood.

2

These days the cutting-edge of entertainment is video games and virtual reality, not the cinema. Several groups are trying to bring scents to virtual worlds. In one paper, Xinge Yu at City University of Hong Kong and Yuhang Li at Beihang University describe two wearable “olfaction interfaces”. The first is the size of a plaster, and is stuck to the skin, like a fake moustache, under the user’s nose. The second, more convenient version is a flexible face mask.

3

Both rely on heating tiny pieces of wax that have been loaded with various liquid perfumes. The smaller version of the system uses two such tiles; the bigger one has nine. The researchers claim that they can generate a scent, such as mint or green tea, in as little as 1.44 seconds. The nine generators on the mask can combine to produce hundreds of possible odours.

4

Drs Li and Yu have been beaten to market by ovr, a startup based in the United States. Its headset uses a system of refillable cartridges, each of which can make thousands of scents. The firm’s newest product, the “ion3”, will be released later this year, and can be tied into existing game-creation tools with minimal fuss.

5

Getting smells right could make virtual worlds more compelling. Odours are famously evocative. The part of the brain that processes them connects directly to parts associated with emotions and memory. People can instantly recall memories of a place or person when they smell a scent which they haven’t experience for decades. Connecting with these emotions could be a game-changing invention for those who like to play on their computer.

6

However, the science is tricky. Unlike colour or sound, where wavelengths and frequencies combine in predictable ways, smell is not so straightforward. Altering a single chemical bond can shift a scent from sweet to rotten. Whether smelly virtual reality will do better than smelly films remains to be seen. But perhaps one day users will be able to stop and smell the virtual roses.

(Adapted from The Economist, May 12th 2023)

Question 1

Match the numbers of paragraphs 1 to 6 with the headings (a) to (h) below. You will **not** need TWO (2) headings.

a) The features of the system.

b) The importance of smells.

c) A pair of inventions.

d) A delicate process.

e) How smells work.

f) Errors prevent success

g) A product to be on sale soon.

h) The success of gaming.

Total 6 Marks

Question 2

Answer each question by choosing the best option: 1,2, 3 or 4.

a) What problem with “Smell-o-vision” did people on a balcony have? **1**

1. The smells were irritating and lasted a long time.
2. The scents were very faint and couldn’t be smelled.
3. The scents did not reach them in time to match the action.
4. There were 30 scents which was too many.

b) How do olfaction interfaces work? **1**

1. Gamers sense smells while drinking tea.
2. Small samples of liquid scent are heated up.
3. The scents are placed in the player’s moustache.
4. Scents are pumped from under the gamers seats.

c) How did ovr beat Drs Li and Yu? **1**

1. They sold their product first.
2. They had better smells.
3. They could be used with more games.
4. They had more customers.

d) Why are companies trying to bring scents to video games? **1**

1. It will help players’ memories.
2. Players will be able to play games from decades ago.
3. Players could play with their childhood friends.
4. It could make gaming a more emotional experience.

e) Why is smell a trickier science than colour or sound? **1**

1. It has many frequencies.
2. It is more unpredictable.
3. Smells can be rotten.
4. Its wavelengths are predictable.

Total 5 Marks

Case Study 2
The development of walking

Read the text and answer the question below.

Humans were not the first creatures to walk. The invention of walking as we know it today began with our ancient aquatic relatives moving from water to land. However, the science of Earth's earliest land walkers is far from settled.

The earliest evidence of efficient walking appears with the lizard-like Orobates in what is now Germany. Nearby and at roughly the same time, the first biped (animals using two legs for walking) emerged in the form of a small plant-eating reptile called Eudibamus cursoris which didn't walk around on two legs but could run to quickly escape predators. More importantly, the species marks the beginning of a bipedal trend that led to many upright beasts strolling across Earth's surface by the reign of the dinosaurs, around 230-66 million years ago.

While Tyrannosaurus rex and other bipedal dinosaurs certainly walked, they didn't look or move anything like us. The modern human-like walk came much later, long after the dinosaurs perished around 66 million years ago. Our ape ancestors began walking upright around 6 million years ago, but it wasn't until the emergence of Homo erectus around 1.9 million years ago that they evolved long legs and started walking as we do.

Because Homo erectus and their relatives did the hard work of 'inventing' our method of walking through evolutionary adaptations, we Homo sapiens were born to do it when our species first emerged around 300,000 years ago.

Why early humans started walking upright is still an open question. Charles Darwin theorised that it freed up the use of our hands to start using tools. While we now know that our ancestors were bipedal long before they were using tools, having hands would have been beneficial for carrying food. Walking upright also allowed humans to move across open landscapes with great efficiency.

As for recreational walking, the kind of walking we do for exercise or to relax, that's probably a modern human invention. Going for a stroll became a popular pastime of Britain's upper classes in the 18th Century and was popularised in guidebooks and romanticised by writers of the time.

(Adapted from BBC Science Focus, June 2023)

Question

Complete the summary below by filling each gap with **ONE (1) or TWO (2) words** from the text.

The first walkers were the lizard-like Orobates. A plant eating reptile could flee from **(a)** _____ although it didn't usually walk. It was the first creature to move on two legs though. The **(b)** _____ walked, but not in the same way as humans. Our early ape ancestors began walking around **(c)** _____ million years ago but it was the development of **(d)** _____ in *homo erectus* which meant they walked similar to us. We therefore didn't have to 'invent' walking but developed it through the **(e)** _____ process. It is still not know when humans started to walk **(f)** _____. One theory is that it enabled us to start using **(g)** _____. It also enabled humans to move **(h)** _____ around as well as survey wide **(i)** _____. The **(j)** _____ hobby of strolling didn't develop until modern times.

Total 10 Marks

Case Study 3
Sofia, Bulgaria

Read the text and answer the question below.

Whether you prefer golden-domed basilicas or Roman ruins, antique flea markets or opulent bathhouses, there's plenty to keep you occupied in the Bulgarian capital. And if you plan it right, it's possible to explore the best the city has to offer in a single day. Here's how to plan the perfect break, taking in all the must-see sights.

1. The Sun Moon bakery

The sweet smell of freshly baked pastry hangs in the air of the Sun Moon neighbourhood vegetarian bakery and restaurant, where diners converge around a large wooden counter and tables, or on a scattering of seating that occupies a parasol-shaded wedge of pavement outside. Homemade breads, traditional banitsa (a sweet pastry served with yoghurt) and lip-smacking smoothies all vie for the affection of early risers, while pizzas and curries are on offer later in the day.

2. The Sofia Regional History Museum

The Sofia Regional History Museum is no longer a functioning bathhouse, but the stunning property is now free for guests to nose around. The floors are still brightly tiled and the large arched windows illuminate plunge pools where bathers once soaked. The exhibits themselves provide an enjoyable overview of the city's colourful history, encompassing everything from Neolithic-age pottery to gold-encrusted royal carriages. Don't forget to sip from the mineral-water drinking fountains outside.

3. Ancient ruins and relics

During construction of the city metro, authorities turned up Roman remains. You'll likely bump into some on any trip underground, but the most impressive section is the Ancient Serdica Complex, comprising the remnants of Roman homes, an early Christian basilica and a bathhouse dating from around the fifth century. For more recent relics, a short walk east is the antique flea market, where you can browse stalls piled with war medals, communist-era signs and vintage cameras.

(Adapted from National Geographic Travel Magazine, February 2023)

Question

Match the sentences to the place by writing the number (1-3) of a place to visit.

a) This attraction can be seen while using a transport system. **1**

b) The products on sale at this attraction vary depending on the time of day. **1**

c) A drink is not mentioned in the description of this attraction. **1**

d) The attraction is in a converted building. **1**

Total 4 Marks

Case Study 4
Biphasic sleep

Read the text and answer the question below.

Biphasic sleep refers to sleep which is taken in two phases within a 24-hour period. Examples of biphasic sleep include taking a nap during the day before sleeping again at night. Another example is of **(a)** _____.

In certain circumstances, biphasic sleep can offer advantages. For example, naps may be particularly beneficial for young children **(b)** _____. Naps may also be useful for those who live in hot locations and might struggle to function during the midday heat. Napping more generally can increase our alertness and functioning, **(c)** _____

Nonetheless, naps are not appreciated by everyone as they can sometimes lead to sleep inertia (a confused state experienced upon waking). They can also make it more difficult to fall asleep at night, **(d)** _____.

When it comes to waking during the night, the historian Arthur Roger Ekirch discovered that before the Industrial Revolution, it was standard to have two sleeps - perhaps going to bed at 9pm or 10pm and waking after midnight for an hour or two, and then falling back to sleep until the morning. This too offered certain advantages, **(e)** _____ such as stoking the fire and preparing food and drink.

(Adapted from BBC Science Focus, March 2023)

Question

Five (5) clauses have been removed from the text. Choose the clauses 1-6 which best fill each gap. You will NOT need one of the clauses.

1) support the immune system and mental wellbeing and reduce stress **1**

2) which has been unproven by the many experiments carried out **1**

3) waking during the night for a period before falling asleep again **1**

4) as it was possible to visit the toilet and attend to tasks during the night **1**

5) as they can support learning and development **1**

6) so are best avoided in people who suffer from insomnia **1**

Total 5 Marks