READING PASSAGE 2

*You should spend about 20 minutes on **Questions 14–26**, which are based on Reading Passage 2 below.*

The Power of Smell

Research shows that our olfactory sense is more influential than we realise

A Dogs' noses are renowned for sensitivity to smells, while human noses are thought to be poor by comparison, yet that might be a misconception. According to recent studies, our noses are in fact acutely sensitive instruments that guide our everyday lives to a surprising extent. Subtle smells can change your mood, behaviour and the choices you make, often without you realising it. Our own odours, meanwhile, indicate emotional states such as fear or sadness to those around us. The big mystery is why we aren't more aware of our nasal activity. Noses have certainly never been at the forefront of sensory research, and were pushed aside until recently in favour of the seemingly more vital senses of vision and hearing. 'There has been a lot of prejudice that people are not that influenced by olfactory stimuli, especially compared to other mammals,' says Lilianne Mujica-Parodi, who studies the neurobiology of human stress at Stony Brook University in New York, in the United States.

B One of the first people to assert the relative unimportance of human smelling was Pierre Paul Broca, an influential 19th-century anatomist. After comparing the proportion of the brain devoted to smell in different animals, he suggested that mammals can be classed into two broad groups: macrosmatic mammals, such as dogs, have a finely tuned sense of smell which they rely on to perceive the world, while we, along with other primates and the marine mammals, are microsmatic – we have small olfactory organs that we only rely on to a small extent. That idea seemed to fit with more recent studies which found that the majority of mammals have genes coding for about 1000 different types of smell receptor. Most of these genes aren't expressed in humans, giving our noses just 400 different types of receptor.

C Yet these findings may have been misleading. Brain scans now show that more of the brain is devoted to smell processing than Broca's anatomical studies suggested. And although we may have fewer types of receptor than other mammals, Charles Greer at Yale University in the United States has shown that the human nose and brain are unusually well connected, with each group of receptors linking to many more neural regions than is the case in other animals. That should give us a good ability to process incoming scents. Once researchers began looking, they found the nose to be far more sensitive than its reputation suggested. One study, for example, found that we can detect certain chemicals diluted in water to less than one part per billion. That means that a person can detect just a few drops of a strong smell like ethyl mercaptan in an Olympic-sized pool.

D ‘We are also exceptionally gifted at telling smells apart, even in the case of two molecules whose only difference is that their structures are mirror images of one another. That is fantastic sensitivity,’ says George Dodd, a perfumer and researcher at the olfaction group of the University of Warwick, in the United Kingdom. What’s more, it’s becoming clear that the brain’s olfactory centres are intimately linked to its limbic system, which is involved in emotion, fear and memory. That suggests a link between smell and the way we think.

E The power of smell will be no news to estate agents, who often advocate the smell of baking bread or brewing coffee to promote the sale of a house. But there are more subtle and surprising effects too. When Hendrik Schifferstein and colleagues, from Delft University of Technology in the Netherlands, pumped the smell of orange, seawater or peppermint into a nightclub, the revellers danced more, rated their night as more enjoyable, and even thought the music was better than when there was no added scent. Meanwhile, Rob Holland, of the University of Utrecht in the Netherlands, found that the hint of aroma wafting out of a hidden bucket of citrus-scented cleaner was enough to persuade students in a hostel to clean up after themselves.

F Other work has found that scent can influence our cognitive skills. A study by William Overman and colleagues at the University of North Carolina in the United States found that when men were subjected to a novel smell – either good or bad – during a task used to test decision-making skills, they performed significantly worse than normal. The researchers conclude the scent stimulated brain areas connected with emotion, making their decisions emotional rather than rational.

G Smells are especially good memory evokers, but it is actually a myth that odours trigger more detailed memories than other stimuli. ‘The memory is not more accurate and you don’t remember more details,’ says Yaara Yeshurun at the Weizmann Institute of Science in Rehovot, Israel, ‘but it is unique in that it is more emotional.’ This isn’t surprising when you consider that there are certain brain areas dedicated to both emotion and olfaction, such as the amygdala, and there is a strong link between emotion and memory. In 2009, Yeshurun found that the link between a memory and a smell is stronger if the smell is unpleasant rather than pleasant. She also discovered that the very first time we attach a smell to an object, it evokes a much greater response in our brains than for any subsequent encounter with the smell or object, laying down stronger foundations for the memory. That doesn’t happen with any other sense. Since those first encounters with a smell would have happened at a young age, this explains why smells often transport us back to our childhood.

Questions 14–19

Reading Passage 2 has seven paragraphs, ***A–G****.*

Which paragraph contains the following information?

Write the correct letter, ***A–G****, in boxes 14–19 on your answer sheet.*

14 a finding that humans can distinguish between two extremely similar substances

15 a categorisation of species according to their sensitivity to smell

16 an instance where smell negatively affected people's ability to make choices

17 a study that proved humans could perceive a tiny quantity of a substance

18 an observation that studies of the sense of smell have been undervalued

19 an example of using smell to prompt people to buy something

Questions 20–23

Look at the following statements (Questions 20–23) and the list of people below.

Match each statement with the correct person, ***A–F****.*

Write the correct letter, ***A–F****, in boxes 20–23 on your answer sheet.*

20 A faint smell could motivate people to do household chores

21 Humans are better equipped to interpret smell than other species are

22 Smell is associated with feelings, rather than the logical part of the brain

23 Humans do not require a sophisticated ability to smell

List of People

A	Lilianne Mujica-Parodi
B	Pierre Paul Broca
C	Charles Greer
D	Hendrik Schifferstein and colleagues
E	Rob Holland
F	William Overman and colleagues

Questions 24–26

Complete the sentences below.

Choose ***ONE WORD ONLY*** *from the passage for each answer.*

Write your answers in boxes 24–26 on your answer sheet.

24 The _____ is a part of the brain that deals with feelings and smell.

25 _____ smells create especially powerful associations with memories.

26 Of all the senses, smell has the capacity to prompt memories of _____.

段落匹配（14–19）

题号	答案	题干翻译	精确定位句（英文原文）	定位句翻译	解释与排除
14	**D**	人类能分辨两种极其相似的物质的一个发现	**D 段**："*We are also exceptionally gifted at telling smells apart, even in the case of two molecules whose only difference is that their structures are mirror images of one another.*"	我们也非常擅长把气味彼此区分开来，即使是两种**唯一差别是彼此为镜像**的分子。	"tell … apart（分辨）" ≈distinguish；"two molecules… mirror images"="两种极其相似的物质"。其他段未谈"镜像分子"的对比，故锁定D。
15	**B**	按嗅觉敏感度对物种进行分类	**B 段**："*he suggested that mammals can be classed into two broad groups: macrosmatic … while we … are microsmatic…*"	他提出哺乳动物可分为两大类：**嗅觉灵敏的**（macrosmatic）与**嗅觉弱的**（microsmatic）。	"classed into two broad groups"="分类"；并以嗅觉敏感度为标准（macrosmatic vs microsmatic）。
16	**F**	嗅觉对人们做出选择的能力产生负面影响的实例	**F 段**："*when men were subjected to a novel smell… they performed significantly worse than normal… making their decisions emotional rather than rational.*"	当男性在任务中暴露于新奇气味（好或坏）时，**表现显著变差**，决策更**感性而非理性**。	"performed worse"=能力受负面影响；主题是"决策任务（choices/decision-making）"。其他段虽谈气味影响，但未涉及"变差/负面"。
17	**C**	证明人类能感知极微量物质的研究	**C 段**："*we can detect certain chemicals… to less than one part per billion… a few drops … in an Olympic-sized pool.*"	我们可检测到**十亿分之一以下**稀释度的化学物，堪比在奥运泳池里几滴气味。	明确是"study found we can detect… less than 1 ppb"，与"tiny quantity（极微量）"同义。
18	**A**	关于嗅觉研究长期被低估的观察	**A 段**："*Noses have certainly never been at the forefront of sensory research, and were pushed aside until recently…*"；以及引语："*a lot of prejudice that people are not that influenced by olfactory stimuli…*"	嗅觉**从未处于研究前沿**，直到近年一直**被边缘化**；并且长期存在"人类不太受嗅觉刺激影响"的**偏见**。	"undervalued/被低估"对应"not at the forefront/pushed aside/偏见"。
19	**E**	用气味促使人们购买某物的例子	**E 段**："*estate agents … advocate the smell of baking bread or brewing coffee to promote the sale of a house.*"	房产中介常用**新鲜面包或咖啡**的味道来**促进卖房**。	"prompt people to buy" ≈ "promote the sale"；E段还举夜店与清洁例，但"购买/交易"对应卖房情境。

人物配对（20–23）

题号	答案	题干翻译	精确定位句（英文原文）	定位句翻译	解释与排除
20	**E（Rob Holland）**	微弱气味能促使人做家务	**E 段**："*the hint of aroma … citrus-scented cleaner was enough to persuade students … to clean up after themselves.*"	**一丝**柑橘清洁剂的气味就足以让学生**自觉打扫**。	"hint（微弱）" + "clean up（家务/清洁）" 精准对应。
21	**C（Charles Greer）**	人类比其他物种更擅长**解释/处理**气味	**C 段**："*the human nose and brain are unusually well connected… linking to many more neural regions … That should give us a good ability to process incoming scents.*"	人类鼻与脑**连接异常发达**，受体组连接**更多脑区**，因而**更善于处理**进入的气味。	题干中的"better equipped to interpret"对应"well connected → good ability to process"。非A/D/E/F/B。
22	**F（Overman 等）**	嗅觉与情感相关，而非大脑的理性部分	**F 段**："*stimulated brain areas connected with emotion, making their decisions emotional rather than rational.*"	气味**激活情感相关脑区**，使决策**偏情感而非理性**。	直击题干对立"emotional vs rational"。
23	**B（Broca）**	人类不需要复杂的嗅觉能力	**B 段**："*we … are microsmatic – we have small olfactory organs that we only rely on to a small extent.*"	人类属**嗅觉较弱**的"microsmatic"，**只在小范围依赖**嗅觉。	"do not require a sophisticated ability" ≈ "rely … to a small extent/器官小"。

句子填空（24–26，ONE WORD ONLY）

题号	答案	题干翻译	精确定位句（英文原文）	定位句翻译	解释
24	**amygdala**	（**大脑中**）**处理情感与嗅觉**的部分是——？	**G 段**："*there are certain brain areas dedicated to both emotion and olfaction, such as the **amygdala**.*"	存在既负责**情感**又负责**嗅觉**的脑区，例如**杏仁核**。	题干限定"一词"；专名小写作答。
25	**unpleasant**	**____**气味会与记忆形成尤为强烈的联结。	**G 段**："*the link … is stronger if the smell is **unpleasant** rather than pleasant.*"	若气味是**不愉快**的，记忆联结更强。	比较级触发词"rather than pleasant"提示答案取"unpleasant"。
26	**childhood**	在所有感官中，嗅觉尤其能唤起对**____**的记忆。	**G 段**："*this explains why smells often transport us back to our **childhood**.*"	这解释了为何气味常把我们**带回童年**。	填"childhood"（不可填"our childhood memories"，因题干已含"memories of …"结构）。