PART 1

Read the text below and answer questions 1–13.

THE UNDERESTIMATED SENSE: AN INTRODUCTION TO OLFACTION

A

For much of modern history, smell has been treated as a secondary sense, especially in cultures that privilege vision and hearing. Yet olfaction plays a constant role in survival and judgement: it warns of smoke, spoiled food, and volatile chemical hazards, and it quietly shapes appetite, avoidance, and social comfort. Recent work has challenged the long-standing stereotype that humans are "poor smellers". While the exact number is debated, evidence from discrimination experiments suggests that human sensitivity and flexibility may be far greater than earlier textbook summaries implied, especially when attention, training, and real-world mixtures are considered.

B

At a biological level, olfaction begins when inhaled molecules dissolve in the nasal mucus and bind to olfactory receptors on olfactory sensory neurons. Each receptor type can respond to a range of odorants, and each odorant can activate multiple receptors, so the brain recognises odours mainly as patterns rather than as one-to-one signals. From the nasal epithelium, signals travel to the olfactory bulb and then project to regions linked to the limbic system, including the amygdala and hippocampus. This close routing helps explain why smell can evoke autobiographical memories with unusual speed and emotional vividness: odour cues are embedded in networks that support both recollection and emotion before conscious verbal labelling has fully occurred.

C

Unlike vision, olfaction does not map neatly onto a single primary stimulus dimension. Odours depend on molecular shape, functional groups, and chemical interactions with receptors, and many smells are experienced as mixtures rather than isolated molecules. Crucially, mixtures can yield emergent perceptions that are not predictable from the components alone, because the nervous system integrates overlapping receptor activity into a unified percept. This makes classification difficult. Two molecules that look similar on paper can smell different if they activate receptors in different ratios, while structurally unrelated molecules can smell alike if they converge on a similar activation pattern. As a result, attempts to organise smells into a tidy "periodic table of odours" have repeatedly run into exceptions.

D

Smell is also an unexpectedly social channel. Human body odours contain cues that can

reflect diet, stress physiology, and aspects of health, though interpretations are strongly shaped by culture and context. Many societies use fragrance as a form of social signalling—marking status, intimacy, or professionalism—and norms about “clean” and “acceptable” odour vary widely. Olfaction can therefore influence interpersonal judgements in subtle ways, affecting perceptions of trustworthiness, compatibility, or comfort even when people are unaware that smell is shaping the interaction. These effects are typically probabilistic rather than deterministic, but they illustrate that olfaction is embedded in social life rather than confined to private sensation.

E

Olfaction also underpins what people commonly call taste. Much of flavour is created by retronasal olfaction, in which volatile compounds from food travel from the mouth to the nasal cavity during chewing and exhalation. When nasal airflow is blocked, foods seem bland because the tongue’s basic tastes cannot supply the full perceptual experience. This is why respiratory illnesses that reduce smell can change appetite and nutrition, and why clinicians increasingly view smell loss as more than a minor inconvenience. Persistent anosmia can affect safety behaviours, dietary quality, and mental well-being, particularly when people lose the pleasure and warning functions that smell normally provides.

F

Smell commonly declines with age, and sudden changes can also signal neurological or infectious conditions. Because loss can occur gradually, people often adapt without noticing, which can hide risk and delay medical attention. Screening tests exist and can be quick, but they are not routinely used in many healthcare systems. A key reason is cultural and institutional undervaluation: if smell is treated as a “lesser” sense, its impairment is less likely to be measured systematically, even though it can affect nutrition, hazard detection, and quality of life. This gap between available tools and routine practice is one reason clinicians argue for broader awareness.

G

Technology is now attempting to engage directly with olfaction. Researchers are developing “electronic noses” that use sensor arrays to detect volatile organic compounds (VOCs) for food safety, environmental monitoring, and medical diagnostics. In principle, these devices translate complex odour mixtures into measurable signals that can be classified by algorithms. In practice, the task is difficult: sensors can drift over time, humidity and temperature can distort readings, and real-world environments are far noisier than laboratory conditions. Datasets may also be biased if they over-represent certain populations or settings, reducing reliability in deployment. As these tools improve, ethical

issues become sharper: if odour signatures can reveal health status, questions arise about privacy, ownership, and potential misuse by employers, insurers, or other gatekeepers.

Questions 1–4

The text has seven paragraphs, **A–G**. Which paragraph contains the following information? Choose the correct letter, **A–G**. **NB** You may use any letter more than once.

1 A biological explanation for why smell can trigger memories unusually quickly and vividly.

2 A reason odours resist tidy classification, including cases where similar molecules smell different.

3 A description of devices that aim to translate complex odour mixtures into measurable patterns for practical applications.

4 A warning that smell-based information could raise data ownership and misuse concerns.

Questions 5–8

Select the correct answer.

5 What point is made about human ability to discriminate odours?

A It is essentially unchanged from earlier estimates.
B It is inferior to vision and hearing in every situation.
C It has little relevance to everyday judgement.
D It may be greater than people once assumed.

6 According to the passage, how does the brain mainly recognise different odours?

A By interpreting patterns across multiple receptor responses.
B By reading a single stimulus dimension comparable to wavelength.
C By matching each smell to one dedicated receptor only.
D By separating mixtures into their original ingredients with ease.

7 What does the passage suggest about what people call “taste”?

A It depends mainly on temperature changes rather than smell.
B It is unaffected when nasal airflow is blocked.
C It often relies heavily on smell.
D It is determined chiefly by cultural expectation.

8 Why are smell-screening tests not widely used in healthcare, according to the passage?

A They are too slow for routine clinical work.
B Smell has been undervalued within health systems.
C They can detect only sudden loss, not gradual change.
D Clinicians think smell loss has no effect on nutrition.

Questions 9–13

Complete the summary below. Choose **NO MORE THAN TWO WORDS** from the text for each answer.

How smell works and why it matters

Smell helps protect people by warning of smoke, **9** ....., and chemical hazards. Odour signals reach areas linked to memory and **10** ..... . Odour mixtures can create **11** ..... that are not predictable from individual components. Smell combines with taste to produce **12** ..... . Odour-sensing technologies create a risk of **13 .....** by employers or insurers.

Answer Key

1. B
2. C
3. G
4. G
5. D
6. A
7. C
8. B
9. spoiled food
10. emotion
11. emergent perceptions
12. flavour
13. misuse