

Academic Reading Paper 17

Noons, Octopuses and Offices

Time allowed: 1 hour

INSTRUCTIONS TO CANDIDATES

- Do not open this booklet until you are told to do so.
- Write your name and the date at the top of the answer sheet.
- Answer **all** the questions.
- Write your answers **on the answer sheet**, not in this booklet.
- You must transfer your answers within the hour. **No extra time is given for transferring answers in the Reading test.**
- Do not remove this booklet from the examination room.

INFORMATION FOR CANDIDATES

- There are 40 questions in this paper.
- Each question carries one mark.
- There are three passages, with 13, 13 and 14 questions.

These passages were written for this library. They are **not** reproduced from any published past paper. The format, timing and task types follow the published specification for the Academic Reading test so that sitting this on paper feels like the real thing.

You should spend about 20 minutes on Questions 1–13, which are based on Reading Passage 1 below.

The day of two noons

Before the railways there was no such thing as the time. There was the time in Bristol, which was about ten minutes behind the time in London, and the time in Oxford, which was five minutes and two seconds behind it, and every one of those readings was correct, because each town set its clocks by the sun standing over that town. The differences were real and nobody minded them. At the speed of a horse, ten minutes could not be lost between one place and the next, and a traveller who arrived to find the church clock disagreeing with his watch had no reason to think either was wrong.

A railway makes that arrangement unworkable, and it does so through the timetable rather than through the trains. A single printed sheet has to state a departure from one town and an arrival in another, and if the two towns are keeping different clocks the sheet is either wrong or has to carry a correction for every station on the line. Worse, two trains approaching each other on a single track are kept apart by an agreement about when each will be where. The Great Western Railway settled the matter for itself in November 1840 by ordering that London time be kept at every station it owned, whatever the town outside thought.

Other companies followed one at a time, and in 1847 the Railway Clearing House recommended that all lines adopt Greenwich time. Most had done so within a year. What the railways could not do was make anybody else agree. Towns went on keeping their own time beside the new one, and some of them advertised the fact: a clock on the Corn Exchange in Bristol was given a second minute hand, ten minutes behind the first, so that a person could read either time from the same face and decide which one they were living by.

The disagreement reached the courts, which is usually where a country discovers that a word it has been using for centuries has no settled meaning. A case was thrown out because a hearing had been called for ten o'clock, the plaintiff had arrived at ten by the railway clock, and the court had sat and risen at ten by the town's own. The judgment held that ten o'clock meant local mean time, since that was what the word had always meant and no statute said otherwise. It was a correct decision and an impossible one, and it made the case for legislation better than any argument had.

Parliament acted in 1880. The Statutes (Definition of Time) Act declared that any expression of time in an Act of Parliament or a legal document meant Greenwich mean time in Great Britain and Dublin mean time in Ireland. The railways had been running on Greenwich for thirty-three years by then. The law did not create the standard; it recorded one that had already won, and it did so only after a court had demonstrated that the alternative produced absurdities.

The United States had the same problem at a larger scale and solved it the same way round. Its railroads were running on more than fifty local times, and the companies, not the government, agreed to divide the country into five zones. The change took effect at noon on 18 November 1883, and in the eastern

cities the clocks reached noon, were set back, and reached it again — the day of two noons. Congress did not make any of this law until 1918, thirty-five years later.

The international settlement came in October 1884, when twenty-five nations met in Washington to choose a prime meridian. Greenwich was already being used by about two-thirds of the world's shipping, and the resolution passed with twenty-two votes in favour, San Domingo against, and France and Brazil abstaining. France went on keeping its own meridian for another generation, and when it finally gave way in 1911 it did so by defining French time as Paris mean time retarded by nine minutes and twenty-one seconds — which is Greenwich time exactly, arrived at without using the word.

It is worth being clear about what was standardised, because it was not time. Nothing was done to the sun, and the moment the sun stands over Bristol is still ten minutes after the moment it stands over Greenwich. What was standardised was the naming of moments: an agreement that when people in different places say ten o'clock they will mean the same instant, at the cost of the number no longer describing where the sun is. Every objection raised at the time was a complaint about that cost, and every one of them was correct, and none of them mattered.

Questions 1–5

Complete the notes below.

Choose **NO MORE THAN TWO WORDS AND/OR A NUMBER** from the passage for each answer.

How Britain came to keep one time

Before the railways

- Every town set its clocks by the sun standing over that town.
- Bristol was about **1** minutes behind London.
- Oxford was five minutes and **2** seconds behind.

The railways impose a standard

- November 1840 — the Great Western ordered that **3** time be kept at every station it owned.
- 1847 — the Railway Clearing House recommended Greenwich time; most lines complied within a year.
- Bristol Corn Exchange — the clock was given a second **4** hand so either time could be read.

The law catches up

- A court ruled that ten o'clock meant local mean time, because no statute said otherwise.
- 1880 — time in a legal document meant Greenwich mean time in Great Britain and **5** mean time in Ireland.

Questions 6–9

Complete the sentences below.

Choose **NO MORE THAN TWO WORDS AND/OR A NUMBER** from the passage for each answer.

- 6** Before 1883 American railroads were running on more than local times.
- 7** At the Washington conference the resolution was carried with votes in favour.
- 8** In 1911 France defined its time as Paris mean time retarded by nine minutes and seconds.
- 9** American time zones were not made law by Congress until

Questions 10–13

Do the following statements agree with the information given in Reading Passage 1?

Write **TRUE** if the statement agrees with the information, **FALSE** if the statement contradicts the information, or **NOT GIVEN** if there is no information on this.

- 10** The Great Western Railway adopted a single time before the Railway Clearing House recommended one.
- 11** The 1880 Act created the standard that the railways then adopted.
- 12** The writer believes the court reached the wrong decision.
- 13** Greenwich was chosen in 1884 because most of the world's shipping already used it.

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

The other intelligence

- A** Whatever an octopus is doing, it is not doing it the way we do. The last common ancestor of a human and an octopus lived something like six hundred million years ago and was probably a flattened worm with a few thousand neurons and no brain worth the name. Everything either lineage has built since then was built separately. If complex behaviour has evolved twice on this planet, and there is reasonable evidence that it has, then the octopus is the closest thing available to an intelligence that did not come from our branch, which is why the animal attracts a kind of attention that a clever crow does not.
- B** The raw numbers invite the comparison and then complicate it. An octopus has in the region of five hundred million neurons, which puts it near a dog and far above any other invertebrate. But the distribution is unlike a vertebrate's: roughly two thirds of those neurons are not in the central brain at all. They are in the arms, about forty million to each, arranged in cords that run the length of the limb, and every one of the two thousand or so suckers carries chemical receptors, so the animal tastes whatever it touches. In a mammal the periphery reports to the centre and the centre decides. Here a very large part of the nervous system sits outside the place where deciding is supposed to happen.
- C** Binyamin Hochner's group established what that arrangement does. An octopus arm reaching for something does not follow a path computed in the brain; it performs a stereotyped wave of stiffening that travels outwards from the body, and the animal aims by choosing where the wave begins. The evidence is uncomfortable and direct: an arm severed from the body still produces the movement when its nerve cord is stimulated. The brain appears to issue a goal rather than a trajectory, and the arm supplies everything else, which is a division of labour no vertebrate limb has.
- D** Jennifer Mather and Roland Anderson reported something that is harder to quantify and harder to dismiss. Given floating pill bottles in a tank, some of their octopuses pushed the bottles into the in-flow jet, watched them come back, and did it again — repeatedly, with no food involved and nothing gained. Whatever that is, it is not foraging, and behaviour of that shape had previously been described only in birds and mammals. It is also the kind of observation that a sceptic can refuse, since a bottle in a current is easy to move by accident.
- E** Anderson also ran a test of whether the animals tell people apart. Two keepers wore identical uniforms; one fed an octopus each day and the other touched it with a bristly stick. After a fortnight the animals moved towards one keeper and away from the other, and changed colour differently at the sight of each. Since the two people looked the same and behaved the same on approach, something was being recognised that was not the uniform. The number of animals involved was very small.

- F** That last sentence is the field's standing problem rather than an aside. Octopuses live one or two years, are solitary, and vary enormously between individuals, so an experiment runs on a handful of short-lived animals that have no species-typical behaviour to average towards. Replication is rare, and an experiment that would take three years cannot be run at all on an animal that will be dead in two. A great deal of what everyone believes about octopus intelligence rests on stories told by people who kept them, and those people were not wrong often enough for the stories to be discarded, nor careful enough for them to be evidence.
- G** Peter Godfrey-Smith has drawn the philosophical conclusion that the anatomy invites. If a large share of the processing happens in the arms, and the brain does not hold a map of where the arms are, then there may be no single place in the animal where things come together. The question of what it is like to be an octopus might not have one answer, because there might not be one subject to have it. That is a claim about organisation, not about how clever the animal is, and the two get confused constantly.
- H** Which is the point most often lost. The interest of the octopus is not that it can open a jar, an achievement that says more about the person holding the stopwatch than about the animal. It is that a nervous system arranged on a different plan produces behaviour we are obliged to call intelligent. Testing it on our problems measures how close it comes to us, which is the one thing about it that is not worth knowing.

Questions 14–21

Reading Passage 2 has eight sections, A–H.

Choose the correct heading for each section from the list of headings below.

Write the correct number, I–XII.

List of Headings

- i Two lineages that built nervous systems separately
- ii Two lineages that lost their nervous systems
- iii How many neurons there are altogether
- iv Where the neurons actually are
- v A limb that reports its position to the brain
- vi A limb that generates its own movement
- vii Behaviour with nothing to be gained from it
- viii Telling apart two people who look the same
- ix Why the evidence is stronger than it looks
- x Why the evidence is thin
- xi A body that may have no single centre
- xii The wrong question to ask about the animal

14 Section A

15 Section B

16 Section C

17 Section D

18 Section E

19 Section F

20 Section G

21 Section H

Questions 22–24

Look at the following findings and the list of researchers below.

Match each finding with the correct researcher, A–C.

List of Researchers

- A** Binyamin Hochner
- B** Mather and Anderson
- C** Peter Godfrey-Smith

- 22** They showed that a limb separated from the body still produces the movement.
- 23** They reported behaviour of a kind previously described only in birds and mammals.
- 24** They argued that the animal may have no single subject of experience.

Questions 25–26

Choose the correct letter, A, B, C or D.

- 25** What does the writer identify as the standing problem in this field?
 - A** Replication has never been attempted.
 - B** Experiments run on very few short-lived and highly variable animals.
 - C** The people who kept the animals were dishonest.
 - D** The animals are too intelligent to be tested.
- 26** According to the final section, the interest of the octopus lies in
 - A** how nearly its abilities approach our own.
 - B** its ability to solve puzzles such as opening a jar.
 - C** the fact that a differently arranged nervous system produces intelligent behaviour.
 - D** the length of time it lives.

You should spend about 20 minutes on Questions 27–40, which are based on Reading Passage 3 below.

Nobody defends the open-plan office

The open-plan office is defended in public by almost no one who works in one and abolished by almost no one who pays for one, which should have been a clue much earlier. The argument runs the same way every time. One side says that removing walls produces collaboration, serendipity and a flatter culture. The other says it produces noise, interruption and the impossibility of thought. Both sides have evidence. Neither side has ever persuaded the other, and they have now been failing to persuade each other for about fifty years, across three complete turns of office fashion. The reason is not that the evidence is weak.

Take the strongest study on the table. Ethan Bernstein and Stephen Turban tracked employees at a large firm before and after a move from cubicles to an open floor, using badges that recorded who spoke to whom rather than asking people to remember. Face-to-face interaction fell by around seventy per cent. Electronic messaging rose. The change designed to make people talk to each other had made them stop, and the mechanism is not mysterious: when everyone can see you, a conversation is a performance, and the cheapest way to keep a conversation private is to type it.

The case against is equally well supported and equally incomplete. Danish research found substantially more sick leave among people in open offices than in individual ones, with the rate rising as the number of people sharing a room went up. Noise studies show the obvious thing about concentration. None of this establishes that walls are what matters, because in every one of these comparisons the wall arrives together with a dozen other changes. The move to open plan is also a move to more people per square metre, to a different manager, to hot desking, and usually to a building somebody chose for its rent. The studies cannot separate them.

Here is the variable I think both sides are missing. What predicts whether people can work is not whether they have a wall. It is whether they control their own interruptions. A private office with a norm that the door stays open and colleagues drop in unannounced is worse than a shared floor on which putting on headphones is understood and respected. The wall is a crude and expensive way of buying something that a convention can supply for nothing, and where the convention is absent the wall does not supply it either, because the person who wants you will simply knock.

That reframing explains the result that otherwise looks perverse. Bernstein and Turban's employees did not stop talking because the wall was gone; they stopped because the wall had been the thing that let them choose when to be available, and nothing replaced it. Given no way to be unavailable, they took the only route left, which was to become unavailable in person and available in writing. Their behaviour was rational. The building had made a decision for them and they were working around it.

None of which is an argument that open plan is fine. It is an argument that the public debate is mislabelled, and there is a reason nobody corrects the label. Open plan persists because of floor area per person, which has fallen by roughly half since the nineteen-seventies. It is cheaper. That is a defensible reason to do it, and it is almost never the reason given, because a company that says collaboration sounds like it is investing and a company that says square footage sounds like it is cutting. So the collaboration argument gets made by people who do not depend on it, and gets attacked by people who correctly do not believe it, and the actual decision is never discussed at all.

If the object is offices that work, three things follow. State the cost per desk out loud, so the trade-off being made is the one under discussion. Give people a way to be unavailable that costs them nothing socially, whether that is a door, a booking system, a signal everyone honours, or hours in which the floor is silent by agreement. And stop measuring collaboration by proximity, which the badge data has now shown does not measure it; if the object is people talking to each other, count the conversations rather than the metres between the desks.

The general form of the point is that a building is not a neutral container for work. Every office encodes a decision about who is entitled to be uninterrupted and who is not, and that decision is usually made by whoever signs the lease and never written down anywhere. Arguing about walls is a way of arguing about that without saying so, which is why the argument has lasted fifty years and produced nothing.

Questions 27–31

Do the following statements agree with the claims of the writer in Reading Passage 3?

Write **YES** if the statement agrees with the claims of the writer, **NO** if the statement contradicts the claims of the writer, or **NOT GIVEN** if it is impossible to say what the writer thinks about this.

- 27** The writer believes that removing walls reliably increases collaboration.
- 28** The writer accepts that the employees in the badge study behaved sensibly.
- 29** Open-plan offices are more common in some industries than in others.
- 30** The writer takes the Danish sick-leave finding as proof that walls are the deciding factor.
- 31** The writer says the real reason for open plan is seldom given publicly.

Questions 32–36

Complete the summary below.

Choose **NO MORE THAN TWO WORDS AND/OR A NUMBER** from the passage for each answer.

What the argument is really about

Bernstein and Turban measured interaction with **32** rather than by asking people to remember, and found that face-to-face contact fell by about **33** per cent. The writer argues that the variable both sides have missed is not the wall but whether people control

their own **34** Open plan survives because floor area per person has fallen by roughly **35** since the nineteen-seventies. A company that gave that as its reason would sound as though it were **36**

Questions 37–40

Choose the correct letter, A, B, C or D.

- 37** How does the writer explain the fall in face-to-face conversation?
- A Electronic messaging turned out to be more efficient.
 - B The wall had been what let people choose when to be available.
 - C The employees disliked their new colleagues.
 - D The firm had appointed the wrong managers.
- 38** Which position does the writer reject?
- A That open plan is cheaper than the alternative.
 - B That the public debate about open plan is mislabelled.
 - C That a wall is what determines whether people can work.
 - D That people need some way of being unavailable.
- 39** Why, according to the writer, does the collaboration argument keep being made?
- A It is made by people who do not depend on it.
 - B There is strong evidence supporting it.
 - C Employees ask for it.
 - D Architects recommend it.
- 40** Which of the following best expresses the writer's conclusion?
- A Every office encodes a decision about who may be uninterrupted.
 - B Open-plan offices ought to be abolished.
 - C Private offices always produce better work.
 - D Collaboration cannot be measured at all.