

Academic Reading Paper 37

Heat, Light and Consent

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 city is warmest at night

The first person to measure the effect was an amateur meteorologist named Luke Howard, who is better remembered for giving clouds their names. Between 1806 and 1830 he kept records at stations inside London and in the country outside it, and published the comparison in a book called *The Climate of London*. The city, he found, was consistently warmer than its surroundings, and the difference was not uniform through the day. It was small in the afternoon and large in the small hours of the morning, and it was largest of all on nights that were calm and clear. He had no explanation for it and did not pretend to one; he had established that it was there and how it behaved.

That pattern is the single most misunderstood thing about the phenomenon. The popular picture is of a city baking under the summer sun while the countryside stays cool, and the daytime difference is in fact modest and can run the other way, since tall buildings shade the streets between them for much of the day. The image is not merely imprecise; it points at the wrong hours. What a city does is hold heat and give it back slowly, so the gap opens after sunset and reaches its maximum several hours later, by which time the countryside has cooled and the city has not.

Three mechanisms produce it and they are all about the material rather than about anything being burned. The first is thermal mass. Brick, stone, concrete and asphalt absorb a great deal of heat during the day and release it slowly at night, where soil and vegetation hold much less and give it up faster. A street is a heat store that charges all day and discharges after dark, and the deeper the material the longer it takes to give up what it holds.

The second is the loss of evaporation. When rain falls on ground with plants in it, much of the water is returned to the air by evaporation and by transpiration through leaves, and evaporation takes a large amount of energy that would otherwise have gone into raising the temperature. A city is designed to remove water as fast as possible through drains, so it has been engineered, deliberately and for good reasons of its own, to prevent exactly the cooling process the surrounding countryside relies on.

The third is geometry, and it is the least obvious. A surface loses heat at night by radiating it to the sky, and how much it can lose depends on how much sky it can see. In open country a field sees the whole hemisphere. At the bottom of a narrow street between tall buildings, most of the view is not sky but other walls, which are themselves warm and radiating back. The narrower the street relative to the height of the buildings, the less the ground can cool, and a courtyard behaves like the bottom of a well.

The size of the effect varies with the city and the weather, and in a large city on a still, clear night the centre can be several degrees warmer than the land beyond the edge of it. Wind reduces the difference because it mixes city air with the air beyond, and cloud reduces it because a cloudy sky returns radiation to the countryside as well and so removes the advantage the city had. That is why the effect is a fair-weather phenomenon, and why the days on which it matters most are the days it is strongest.

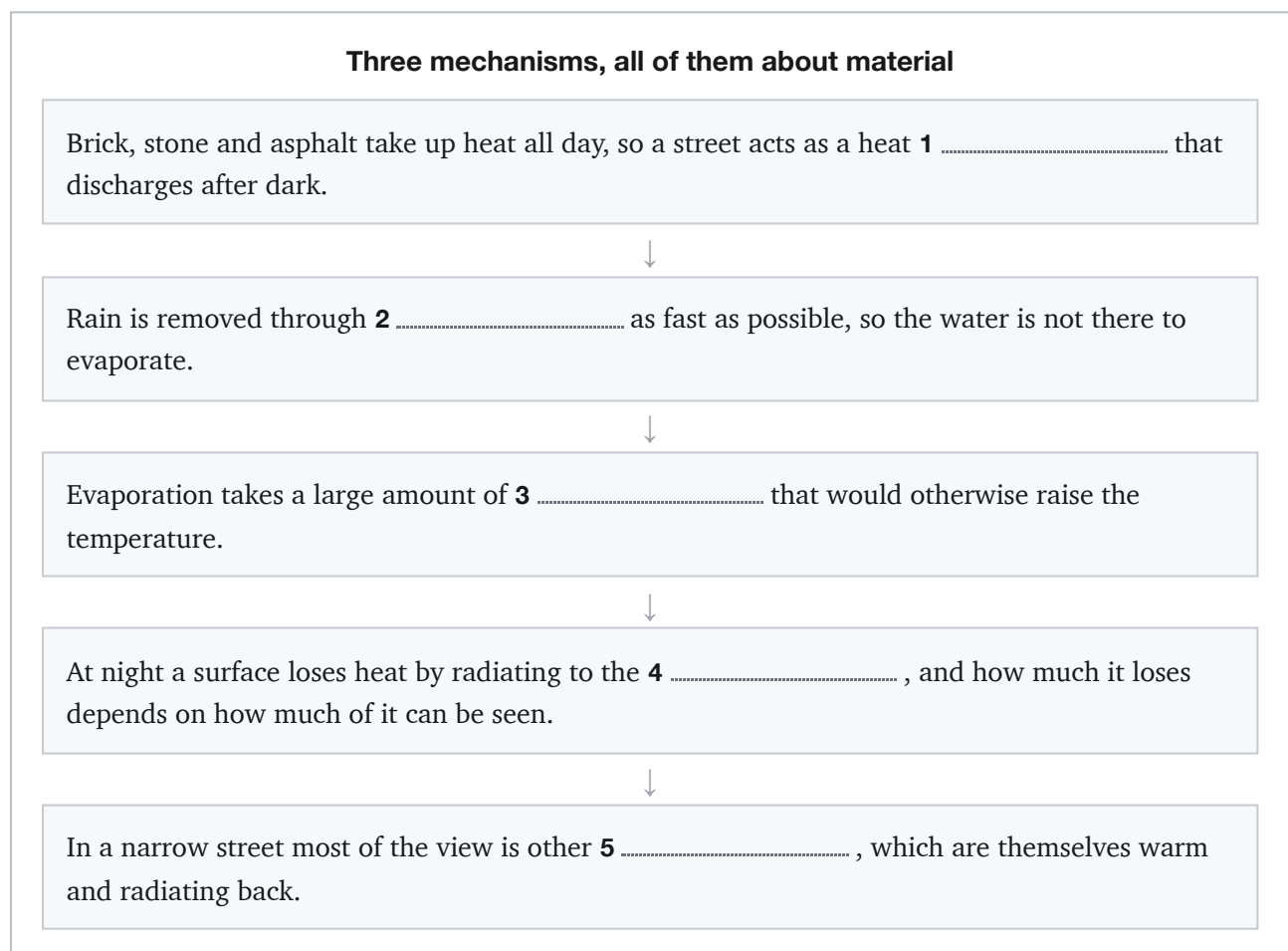
The remedies follow from the mechanisms and one of them is usually explained wrongly. Lighter surfaces reflect more sunlight and therefore store less heat. Trees help, and the popular explanation is shade, but shade only prevents the ground from heating during the day and the larger contribution is transpiration, since a mature tree moves a considerable quantity of water into the air and takes the energy for it out of the surroundings. A paved square with a canopy stretched over it is not the same intervention as a paved square with trees in it, and the two are routinely costed as though they were.

The uncomfortable part is that the effect is not simply a harm to be removed. In a hot climate it is dangerous, because the nights are when a body recovers from heat and a city that does not cool removes that recovery. In a cold climate the same mechanism reduces the number of deaths in winter, and the net effect across a year depends on where the city is. Anybody who reports the phenomenon as straightforwardly bad has decided, usually without saying so, which half of the year to look at.

Questions 1–5

Complete the flow-chart below.

Choose **NO MORE THAN TWO WORDS** from the passage for each answer.



Questions 6–9

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.

- 6 Howard did not attempt to explain the difference he had measured.
- 7 The difference between city and country is greatest in the afternoon.
- 8 Howard's measurements were disputed by other meteorologists of his time.
- 9 Trees cool a city mainly by providing shade.

Questions 10–13

Complete the sentences below.

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

- 10 Howard kept his records between 1806 and
- 11 The effect is largest on nights that are calm and
- 12 Wind reduces the difference because it city air with the air beyond.
- 13 In a hot climate the effect is dangerous because the nights are when a body
..... from heat.

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

How a plant finds the light

- A** A seedling on a windowsill bends towards the window, and the everyday explanation is that it grows faster on the dark side. That is correct and it does not answer the question. A plant has no eyes and no nervous system, and something in it must nevertheless detect which direction the light is coming from, and communicate that to cells some millimetres away which will do the growing. The chain of experiments that established how is unusually clean, each one removing a single possibility, and it begins with somebody better known for something else entirely.
- B** Charles Darwin, working with his son Francis in the last years of his life, published a book on the movement of plants in 1880. They used the young shoots of grasses, which emerge from the seed inside a protective sheath a few centimetres long, and they did something simple that anybody could have done at any point in the previous two centuries. They covered the very tip of the sheath with a small cap of foil and lit the seedling from one side. It did not bend. When they covered a band lower down instead, leaving the tip exposed, it bent normally. The part that detects the light is therefore not the part that does the bending, and a signal of some kind travels between them. That is a great deal to establish with a piece of foil.
- C** The next question is what kind of signal, and Peter Boysen-Jensen answered it in 1913 by cutting the tip off and putting it back with a barrier in between. A block of gelatin, which is permeable to dissolved substances, allowed the bending to continue. A sheet of mica, which is not permeable, stopped it. Whatever passes from the tip to the growing region below travels as a chemical in solution rather than as anything electrical, since an electrical signal would have crossed the gelatin as readily as the mica.
- D** Frits Went completed the sequence in 1926 with an experiment that isolated the substance without identifying it. He cut off tips and stood them on small blocks of agar so that whatever they released would diffuse into the jelly. He then took a seedling with its tip removed, which will not bend and barely grows, and placed one of these blocks on one side of the cut surface, in complete darkness, with no light present anywhere in the experiment. The seedling bent away from the side carrying the block. Nothing had been seen, isolated or named, and the existence of a growth-promoting substance had been demonstrated, along with the fact that it produces bending by being present in greater quantity on one side than the other. The substance was named auxin, and identifying what it actually was took a further nine years.
- E** What is now known is that the tip carries a receptor sensitive to blue light, that light on one side reduces the amount of the substance moving down that side, and that the resulting imbalance makes the cells on the shaded side elongate more than those on the lit side. The bend is not growth to-

wards the light. It is a difference in the rate at which cells on the two sides stretch, and the distinction is worth keeping because it explains why the response is fast, why it can be reversed when the light moves, and why it stops as soon as the two sides are receiving the same amount.

F A quite separate system measures something else, and the difference between the two is the part most often collapsed. A second family of receptors responds to the ratio between red and far-red light. Leaves absorb red strongly and let far-red through, so light that has passed through a canopy above is depleted in red while the far-red passes on. A plant sitting under another plant is therefore receiving light with a signature that could not have been produced by anything else. It responds by growing taller quickly, putting resources into stem rather than leaf, and flowering earlier. This is not a response to brightness. It is a response to the specific evidence that a competitor is overhead, and it will occur under a light that is bright but has the wrong ratio in it.

G It is worth resisting the framing that usually accompanies these findings, which is that plants can see. What has been established is a set of specific photoreceptors driving specific responses: one system detects the direction of blue light and adjusts growth on two sides of a stem, another detects a shift in the ratio of two wavelengths and changes the plant's whole strategy. That is a great deal more interesting than a metaphor about vision, and it has the advantage of being what the experiments actually showed.

Questions 14–20

Reading Passage 2 has seven sections, A–G.

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

Write the correct number, I–X.

List of Headings

- i** A question the everyday answer does not settle
- ii** A question the everyday answer settles
- iii** The detector and the mover are different parts
- iv** The detector and the mover are the same part
- v** Ruling out an electrical signal
- vi** Ruling out a chemical signal
- vii** Demonstrating a substance without identifying it
- viii** What the imbalance actually does to the cells
- ix** A second system measuring something else entirely
- x** A metaphor worth refusing

14 Section A

15 Section B

- 16** Section C
17 Section D
18 Section E
19 Section F
20 Section G

Questions 21–24

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

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

NB You may use any letter more than once.

List of Researchers
A the Darwins
B Peter Boysen-Jensen
C Frits Went

- 21** He collected a substance into blocks of jelly.
22 They covered a small part of the seedling with foil.
23 He produced bending with no light present anywhere in the experiment.
24 He used two materials, one permeable and one not.

Questions 25–26

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

- 25** What does the shade-avoidance system respond to?
A A fall in overall brightness.
B A shift in the ratio between red and far-red light.
C The direction of blue light.
D The temperature under a canopy.
- 26** What does the passage say has actually been established?
A That plants possess a form of vision.
B That specific photoreceptors drive specific responses.
C That plants grow towards light.
D That auxin was identified in 1926.

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

Why nobody reads the terms

Everybody agrees that nobody reads the terms and conditions, and the agreement conceals a disagreement about whose fault that is. One account holds that people are careless: the document is there, it is legally binding, and a person who clicks without reading has made a choice. The other holds that the whole apparatus is a fiction, that consent obtained this way is worthless, and that the pretence of agreement is a way of moving responsibility onto the person with the least power in the transaction. The first is unrealistic and the second is unhelpful, since a thing described as worthless is generally left in place. The interesting question is narrower: what consent can actually do, and where.

Start with the arithmetic, because it settles part of the argument immediately. Researchers who measured the length of the privacy policies encountered by an ordinary internet user in a year, and applied a standard reading speed, arrived at a figure of about two hundred hours a year: something in the region of seventy-six working days spent reading documents in order to use the services one already pays for. That is not a calculation about laziness. Reading the documents is not an option that a reasonable person has declined; it is not an option.

The second problem is that reading would not help, because there is nothing to do with what is read. The terms are offered as a single block, on a take-it-or-leave-it basis, by a service that frequently has no substitute. A person who reads a clause they dislike, and understands it, and objects to it, has exactly two courses available, which are to accept it or to go without the thing altogether, and where the thing is a bank, an employer's software or the platform on which their trade is conducted, going without is not a decision anybody would describe as free.

Nor are the documents written to be understood. They are written to be legally sufficient, which is a different objective and often an opposing one, since the language that survives a court is precise in ways that make it unreadable, and any clause simplified for clarity has been made ambiguous for a lawyer. Every incentive on the drafter points towards a document optimised for the small number of readers who will litigate it rather than the millions who will click it.

Put those three together and the conclusion follows. Consent is a mechanism that works when a person has a real alternative, when the terms are few enough to be held in the head, and when the document has been written for them. Those conditions are met when you sign a lease or take a job, which is why we ask for consent in those settings and expect it to mean something. They are not met when you install an application, and continuing to ask for consent there does not create the thing it names.

The consequence is that a great deal of regulatory weight is being placed on a structure that cannot carry it. If the answer to a question about how personal information may be used is that the user agreed, then the protection amounts to whatever the drafter chose to put in a document nobody could read and nobody could decline. Requiring clearer notices, larger buttons or more frequent confirmations does not re-

pair this, because none of them touches the two problems that matter, and the last twenty years of that approach have produced a web in which every page opens with a request to agree to something and nobody is better informed than before.

What works instead is regulating the substance: rules about what may be collected and what may be done with it, which apply whether or not anybody agreed to them, in the way that safety standards apply to a kettle regardless of what the purchaser signed. This is not a novel principle. It is how consumer protection has worked for a century in every field where the parties are unequal and the product is too complicated for a buyer to assess: food, medicines, electrical goods, aircraft.

The concession is that disclosure is not worthless and abolishing it would be a mistake. A published document creates a record, and a company that states its practice can be held to it, which gives regulators and journalists something to check against behaviour. That is a real function, it costs almost nothing to preserve, and it is worth keeping for its own sake. It is simply not the function that the word consent implies, and describing a compliance record as an agreement freely entered into is the part that should stop, because the description is doing work the document cannot support.

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 thinks people who click without reading have made a careless choice.
- 28 The writer accepts that a published document gives regulators something to check against.
- 29 The researchers also recorded how many people had in fact read a policy.
- 30 The writer believes disclosure requirements should be abolished.
- 31 The writer holds that consent means something when a person signs a lease.

Questions 32–36

Complete the summary below.

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

Three reasons the mechanism fails

Reading a year's privacy policies at a standard speed would take around two hundred hours, or about **32** working days. Reading would not help in any case, because the terms are offered as a single block on a **33** basis by a service that often has no substitute. And the documents are written to be legally **34** rather than to be

understood. The writer's alternative is to regulate the **35**, by rules that apply whether or not anybody **36** to them.

Questions 37–40

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

- 37** Why does the passage say a clause simplified for clarity creates a problem?
- A It becomes too short to be enforceable.
 - B It has been made ambiguous for a lawyer.
 - C It cannot be translated.
 - D It must be approved by a regulator.
- 38** Which position does the writer reject?
- A That consent works where there is a real alternative.
 - B That clearer notices and larger buttons would repair the problem.
 - C That a published statement creates a useful record.
 - D That the parties to these agreements are unequal.
- 39** What comparison does the passage draw with safety standards for a kettle?
- A They apply regardless of what the purchaser signed.
 - B They are simpler than privacy rules.
 - C They were introduced more recently.
 - D They depend on the buyer's consent.
- 40** Which of the following best expresses the writer's conclusion?
- A Keep disclosure for the record it creates, and stop calling it an agreement.
 - B Require users to confirm their consent more often.
 - C Abolish published terms and conditions.
 - D Make all terms and conditions shorter.