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Academic Reading Practice Test 53

Reading Passage 1

The power of light

Light reveals the world to us. It sets our biological clocks. It triggers in our brains the sensations of colour. Light feeds us, supplying the energy for plants to grow. It inspires us with special effects like rainbows and sunsets. Light gives us life-changing tools, from incandescent bulbs to lasers and fibre optics.

There has been light from the beginning. There will be light, feebly, at the end. In all its in forms, visible and invisible, it saturates the universe. Light is more than a little bit inscrutable. Modern physics has sliced the stuff of nature into ever smaller and more exotic constituents, but light won't reduce. Light is light- pure, but not simple. No one is quite sure how to describe it. A wave? A particle? Yes, the scientists say Both.

It is a measure of light's importance in our daily lives that we hardly pay any attention to in it. Light is almost like air. It's a given. A human would no more linger over the concept of light than a fish would ponder the notion of water. There are exceptions, certain moments of sudden appreciation when a particular manifestation of light, a transitory glory; appears: a rainbow, a sunset, a flash of lightning in a dark sky the shimmering surface of the sea at twilight, the dappled light in a forest, the little red dot from a professor's laser pointer. The flicker of a candle, flooding a room with romance. The torch searching for the circuit breakers after a power cut.

Usually, though, we don't see light, we merely see with it. You can't appreciate the beauty of a rose if you ponder that the colour red is just the brain's interpretation of a specific wavelength of Light with crests that are roughly 700 nanometres apart. A theatrical lighting director told me that she's doing her job best when no one notices the lights at all. Her goal is to create an atmosphere, a mood - not to show off the fancy new filters that create colours of startling intensity.

Light is now used for everything from laser eye surgery to telephone technology. It could even become the main power source for long- distance space travel. The spaceship would have an ultrathin sail to catch the 'wind' of light beamed from an Earth-based laser. In theory such a craft could accelerate to a sizeable fraction of the speed of light, without carrying fuel.

What we call light is really the same thing in a different set of wavelengths as the radiation that we call radio waves or gamma rays or x- rays. But visible light is unlike any other fundamental element of the universe: it directly, regularly and dramatically interacts with our senses. Light offers high-resolution information across great distances. You can't hear or smell the moons of Jupiter or the Crab Nebula. So much of vital importance is communicated by visible light that almost everything from a fly to an octopus has a way to capture it - an eye, eyes, or something similar.

It's worth noting that our eyes are designed to detect the kind of light that is radiated in abundance by the particular star that gives life to our planet: the sun. Visible light is powerful stuff, moving at relatively short wavelengths, which makes it biologically convenient. To see long, stretched-out radio waves, we'd have to have huge eyes like satellite dishes. Not worth the trouble! Nor would it make sense for our eyes to detect infrared light (though some deep-sea shrimp near hot springs do see this way). We'd be constantly distracted, because in these wavelengths any heat-emitting object glows. That would include almost everything around us.

There is also darkness in the daytime: shadows. There are many kinds of shadows, more than I realized until I consulted astronomer and shadow expert David Lynch in Topanga Canyon, up the coast from Santa Monica, California. Lynch points out that a shadow is filled with light reflected from the sky, otherwise it would be completely black. Black is the way shadows on the moon looked to the Apollo astronauts, because the moon has no atmosphere and thus no sky to bounce light into the unlit crannies of the lunar surface.

Lynch is a man who, when he looks at a rainbow, spots details that elude most of us. He knows, for example, that all rainbows come in pairs, and he always looks for the second rainbow: a faint, parallel rainbow, with the colours in reverse order. The intervening region is darker. That area has a name, wouldn't you know: Alexander's dark band. As I took in the spectacular view across the canyon, Lynch explained something else: 'the reason those mountains over there look a little blue,' he said, indicating the range that obscures the Pacific, 'is because there's sky between here and those mountains. It's called airlight.'

What next for light? What new application will we see? What orthodoxy-busting cosmic information will starlight deliver to our telescopes? Will the rotating disco ball ever make a dance-floor comeback? Above all, you have to wonder: will we ever fully understand light?

There have been recent headlines about scientists finding ways to make light go faster than the speed of light. This is what science fiction writers and certain overly imaginative folks have dreamed of for decades. If you could make a spaceship that wasn't bound by Einstein's speed limit, they fantasized, you could zip around the universe far more easily.

Lijun Wang, a research scientist at Princeton, managed to create a pulse of light that went faster than the supposed speed limit. 'We created an artificial medium of cesium gas in which the speed of a pulse of light exceeds the speed of light in a vacuum,' he said, 'but this is not at odds with Einstein. ' Even though light can be manipulated to go faster than light, matter can't. Information can't. There's no possibility of time travel.

I asked Wang why light goes 186,282 miles a second and not some other speed. 'That's just the way nature is,' he said. There are scientists who don't like 'why' questions like this. The speed of light is just what it is. That's their belief. Whether light would move at a different velocity in a different universe is something that is currently outside the scope of experimental science. It's even a bit 'out there' for the theorists.

What's certain is that light is going to remain extremely useful for industry, science, art, and our daily, mundane comings and goings. Light permeates our reality at every scale of existence. It's an amazing tool, a carrier of beauty; a giver of life. I can't help but say that it has a very bright future.

Questions 1-5

Reading passage 3 describes a number of cause and effect relationships. Match each Cause (1-5) in List A, with its Effect (A-H) in List B. There are more Effects in List B than you will need, so you will not use all.

List A Causes

1. **Much of the time, visible light is all around us.**
2. **Light can sometimes appear in an interesting way.**
3. **Visible light carries a lot of essential information.**
4. **Without an atmosphere, light is not reflected onto solid surfaces.**
5. **Only light can exceed 186,282 miles per second.**

List B Effects

A. **Nearly all living creatures can detect it.**
B. **There is a dark gap between rainbows.**
C. **Light from Earth could power a spacecraft.**
D. **Shadows are totally black.**
E. **We cannot return to the past.**
F. **We don't really notice or think about it.**
G. **Certain creatures can detect infra—red light.**
H. **We instantly become aware of it.**

Questions 6-10

Do the following statements agree with the views of the writer in Reading Passage 1? Write

YES the statement agrees with the views of the writer
NO the statement does not agree with the views of the writer
NOT GIVEN there is no information about this in the passage

6. **It is difficult to find a single word to say exactly what light is.**
7. **Thinking about the physics of light can make an object seem even more beautiful.**
8. **Light from the sun makes it possible for life to exist on other planets.**
9. **It is more practical for humans to detect visible light rather than radio waves.**
10. **David Lynch sometimes notices things that other people don't.**

Questions 11-13

Answer the following questions using NO MORE THAN THREE WORDS for each answer.

11. **What appearance can the land have when seen from a distance?**
12. **In what have some people imagined travelling? .....**
13. **In what substance did light go faster than previously thought possible?**

Reading passage 2

To MBA or not to MBA

'You could be forgiven for thinking just about every man and his dog has an MBA these days,' says Anthony Hesketh, of Lancaster University management school. We know what he means. Such is the worldwide growth and awareness of the MBA that this icon of career advancement and high salaries has almost become synonymous with postgraduate education in the business sector.

In reality, many postgraduate alternatives to an MBA exist. The total number of MBA programmes worldwide is around 2,400, while other masters and advanced courses in the whole spectrum of business education add up to more than l0,000.

Two key distinctions exist in matching what aspiring students want with what the universities offer: first is generalization versus specialization, and second is pre-experience versus post-experience and the two distinctions are interlinked. Carol Blackman, of the University of Westminster school of business, explains the first distinction. 'Specialist masters programmes are designed either for career preparation in a clearly defined type of job or profession, or are intended to develop or enhance professional competence in individuals who are already experienced. The aim is to increase the depth of their knowledge in the specialist area. The MBA, on the other hand, is a general management programme which provides practising managers with an opportunity for personal development with a broadly-based introduction to all management subject areas and the theory and practice of management'.

Specialist knowledge, however, is not everything when it comes to finding a job. Surveys by the UK's Association of Graduate Recruiters (AGR) repeatedly confirm that what employers seek, and continue to find scarce, are the personal skills that will make graduates valuable employees. In fact, when recruiting new graduates most employers considered these skills more important than specialist knowledge. What employers seek most from new graduates are enthusiasm and self- motivation, interpersonal skills, team working and good oral communication. Of the nineteen skills considered important in AGR's 2002 survey, just three require specialist education - numeracy, computer literacy and foreign languages – and these are low on the list.

Nunzio Quacquarelli, chief executive of topcareers.net, takes this further. 'Clearly, salary differentials for those with a second degree, but no significant work experience, do not match those of a good MBA and a number of years in the workplace. According to the AGR research, about l4% of employers offered a better salary to those new graduates with a masters - or even a doctorate. In my view, the salary improvement of l0% to l5% largely reflects the recruit's age and earning expectancy rather than the increase in human capital perceived by the employer. Contrast this with our latest topmba.com MBA Recruiters Survey results which shows that the average salary paid to an MBA with good work experience in the US and Europe is US$80,000 — around two and a half times the average starting salary for a young postgraduate.'

Anthony Hesketh poses the question whether holding a second degree may even be a disadvantage. 'I have seen many reports over the years suggesting that employers view postgraduates as eminently less employable than those with a first degree. Drive, motivation and career focus, not to mention ability, are what employers value and are prepared to pay for. A postgraduate immediately has an uphill task explaining an additional year; or three years, of study.'

This view may seem cynical, but, if you are about to graduate and are considering a further degree, you should take the realities into account and ask yourself some hard questions:

- **Is the qualification I am considering going to impress employers?**
- **Is it going to give me the edge over less qualified candidates?**
- **Is my consideration of a second degree because I am not sure of my career direction?**
- **Will employers consider that I lack drive and ambition because I have deferred my attempts to find a worthwhile job?**

Many postgraduate options exist that can help you to acquire the personal skills that employers in the world of business are seeking. Consider, for example, the offerings of Strathclyde and Durham universities.

According to Dr Nic Beech, of the University of Strathclyde graduate school of business: 'The

MSc in business management (MBM), offered at USGSB is suitable for students with a good first degree - particularly a non-business first degree — but little or no business experience. Our MBM offers these graduates the opportunity to combine the specialization of their first degree with a general management qualification – something employers recognize produces a well-rounded individual.

Graduates tell us that the MBM allows them to access sectors previously out of reach. It is designed to develop the business knowledge, practical experience and personal skills which employers are seeking.'

At the University of Durham business school, Sheena Maberly is careers development officer; she too sees high value in qualifications such as the Durham MA in management (DMAM). She says: 'Whatever your first degree, from anthropology to zoology, a postgraduate business degree can help you gain a competitive edge in an over-crowded job market. If you're just starting out in your career, a business master's degree like the DMAM will enable you to develop skills directly relevant to employers' needs. So, extending your studies into management can make you better equipped to 'hit the ground running' — and that's what employers expect. Recruiters are highly selective and a vocational qualification is additional evidence of motivation.

Before committing yourself to postgraduate study, weigh up the options. Perhaps the best route might be to take a job now and plan to do an MBA a few years down the line? Try to get sponsorship from a company. Or go for a well researched and thoroughly thought through masters that will help you land a good job. Ultimately the choice is yours, but focus on the future, and on your target employer's expectations.

Questions 14-16

Do the following statements agree with the information given in Reading Passage 2? Write

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

14. **British employers are more interested in what potential recruits can do than what they know.**
15. **A recruit with a specialist masters usually earns as much as an experienced employee with a good MBA.**
16. **The writer claims that undergraduates often plan to do a masters because they can't decide what career to follow.**

Questions 17-21

The text quotes various individuals. Match the four people A-D with the four points made in Questions 17-21. You may use any of the people more than once.

17. **Employees with postgraduate qualifications earn more because they are older and expect more.**
18. **It can be difficult to convince an employer that the extra time spent at university was necessary.**
19. **One type of course focuses on a particular aspect of business, whereas the other is more general in approach.**
20. **Graduates who have neither worked in nor studied business are suited to our programme.**
21. **There is evidence that companies may prefer to employ people without a masters degree.**

List of people
A Anthony Hesketh
B Carol Blackman
C Nunzio Quacquarelli
D Nic Beech

Questions 22-27

Complete the summary below Choose ONE word from Reading Passage 2 for each answer. According to Sheena Maberly, a second degree can improve the 22..... prospects of graduates in any subject. Taking a management MA gives them the 23 ..... companies are looking for, and lets them get straight on with the job as soon as they start work. It also shows they have the 24 ..... that companies seek. First, however, it is important to consider the 25 ..... : whether to start right away on a carefully chosen postgraduate course, or to do so after a few years' work, preferably with financial assistance from the 26 ..... . Whichever they decide, they should think about the 27 ..... , and what the company wants.

Reading passage 3 **Questions 28-33** **Reading passage 3 has seven paragraphs A—G. Choose the most suitable headings for paragraphs B—G from the list of headings below.**

List of headings

i. Looking at a particular decade
ii. Studying trees frozen in ice
iii. Bringing different studies together
iv. Records of different species compared
v. What dendrochronology is
vi. A war that affected the climate
vii. Showing how trees record volcanic activity
viii. A unique record of other times and places
ix. Local records covering thousands of years
x. How tree rings are formed

Example
Paragraph A Answer v

28. Paragraph B
29. Paragraph C
30. Paragraph D
31. Paragraph E
32. Paragraph F
33. Paragraph G

The Ring Cycle

A. In the jungle of scientific debate, you cannot always see the wood for the trees. But in climate change, the wood itself sometimes holds the key Imagine an annual register of a year's sunshine and rainfall and frost, kept up to date with perfect accuracy almost everywhere south of the tundra and north of the tropics, and available for inspection not just at any time in life but, quite often, for centuries after death. The register is, of course, the annual growth rings of trees. Match the rings from young trees with those from old forest giants and you have a centuries-long measure of the march of the seasons. Match the rings from old trees with old cathedral rafters and you have a still longer chronology — and a science called dendrochronology

B. Dendrochronologists, scientists who study the growth of rings in trees, have successfully constructed long tree-ring records by overlapping the patterns of wide and narrow rings in successively older timber specimens. There are now a dozen or so chronologies in the world that date back more than 5,000 years. These records, normally constructed in a restricted area, using a single species of tree, are year-by- year records of how the trees reacted to their growth conditions — an environmental history from the trees' point of view.

C. Because tree-ring chronologies are constructed on a regional basis, there has, in the past, been a tendency for dendrochronologists to think local. However, the success of dendrochronology as an international research topic means that there are now quite a lot of chronologies available for study As the chronologies are dated absolutely it is possible to compare the records from different areas year by year. Recently; an analysis of 383 modern chronologies, drawn from a vast area across Europe, northern Eurasia and North America was published. The authors, Keith Briffa and colleagues, observed that the maximum late-wood density of the growth rings in each year was related to the temperature in the growing season. Their analysis spanned 600 years, back to AD 1400, and presented a summer temperature record reconstructed from the huge grid of precisely dated ring densities. What they noticed was that the years of really low density — the cool summers were directly associated with large explosive eruptions, as known from historical sources and from dated layers of acid in the Greenland ice record. Greenland ice is kilometres thick and is made up of the compressed snowfall of tens of thousands of years, so the ice record can be read in almost the same way as tree-rings. I shall use this study as an example of what else tree-rings can tell us.

D. The study provides a year-by-year estimate of temperatures, together with the dates of some major volcanoes. It is a nice clean story — volcanoes load the atmosphere with dust and aerosol and reflect back sunlight, cooling the earth's surface. This cooling leads to variations in the density of growth rings in northern conifers. Because there are a lot of other records, it is possible to test the findings from the conifer density record.

E. We can, for example, look at what European oak was doing across the same 600-year period. Was oak responding in the same way as the conifers? The 'oak chronology' is the mean of eight regional oak chronologies across a strip of land from Ireland to Poland. It represents how, on average, hundreds of millions of oaks grew. What we see from this comparison is that the oaks clearly do respond to the volcanoes in some cases (in 1602, 1740 and 1816, for instance), but nothing like so clearly in others. Immediately it becomes apparent that the conifers tell only part of the story. There are many downturns in oak growth, and only a few are related to the conifer

record. The oaks were quite capable of being more stressed in years where the conifers were not affected. The point of this, however, is not to argue about the quality of global cooling; the point is to show what dendrochronology can do.

F. Take the case of 1816, called the 'year without a summer' because of the terrible unseasonable cold and the crop failures that ensued. It has long been known that the primary cause of the cooling was the massive eruption of Tambora, east of Java, in 1815. However, there was a lot more going on in the run—up to 1816. Bald cypress trees in Tennessee show a major growth anomaly, with rings up to 400 per cent wider than normal, in the years following a huge earthquake in 1811-12 in Eastern America. But there is a volcanic acid layer in several Greenland and Antarctic ice cores in 1809-10, as well as in 1815-16. So here we have a combination of a highly unusual quake in an area of the USA not normally affected by earthquakes, and at least two volcanic eruptions, including Tambora, which is widely regarded as the largest in the last 10,000 years. According to Briffa, the period 1810-20 was the coldest in the last millennium, so we begin to see a combination of three unusual elements in less than ten years — exceptional earthquake, exceptional volcanic eruption, and exceptional cold. Given that the defeat of Napoleon's invasion of Russia in 1812 was famously attributed to 'General Winter', one wonders whether a natural series of events actually helped to change the course of modern history.

G. Obviously, the case of 1816 and the years just before and after it is relatively recent and well documented. However, dendrochronology allows us to investigate the effects of such events geographically, indeed globally. We can interrogate the trees in areas where there is no historical or instrumental record. Further back in time, dendrochronology is almost the only way to reconstruct abrupt environmental events and perhaps throw new light on far darker moments in human history Were there just political forces at work in the Dark Ages, or did violent natural events also take a hand, tipping the balance by darkening the skies and lowering the temperature? The trees were there too, and kept a record. The wood hewn from them and preserved through the centuries is slowly beginning to yield at least circumstantial evidence that could support some of the stories — think of the Arthurian wasteland, or the plagues of Egypt — so far told only in enigmatic artefacts, or in legends, epics, and religious chronicles.

<u>Questions 34-36</u> Which THREE of the following, are features of dendrochronology?

- **A. It provides a complete record of the weather in any part of the world.**
- **B. It involves the study of ring patterns in trees of different ages.**
- **C. A piece of wood cut a long time ago can form part of the record.**
- **D. Studies show that trees of the same type all have the same number of rings.**
- **E. As a science it has existed for over 5,000 years.**
- **F. The oldest records are mostly of one type of tree in one place.**

<u>Questions 37-40</u> Choose the correct letters A, B, C or D.

37. What was the result of extending the research to the European oak?
- **A. It added information to that obtained from studying conifers.**
- **B. It contradicted all the findings from the study of conifers.**
- **C. It showed exactly the same results as those for conifers.**
- **D. It proved that the world has cooled considerably since 1400 AD.**

38. Which of these happened as a result of the eruption at Tambora?
- **A. Agricultural production fell significantly.**
- **B. There was an earthquake in North America.**
- **C. Part of the polar ice caps melted.**
- **D. The outcome of a war changed.**

39. By studying tree rings, we may discover
- **A. Whole new areas of human history.**
- **B. Proof of events said to have happened.**
- **C. How earlier civilizations treated the environment.**
- **D. The truth about the nature of religious belief.**

40. A suitable title for this passage would be
- **A. How volcanoes and earthquakes changed history**
- **B. The influence of trees on the world's climate**
- **C. The role of trees in human history**
- **D. How trees can tell us more about the past**