The National University of Kyiv-Mohyla Academy

The English Language Department

ENGLISH FOR INFOMATION TECHNOLOGY:

Навчальний посібник для студентів факультету інформатики

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The National University of Kyiv-Mohyla Academy

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Навчальний посібник «ENGLISH FOR INFORMATION TECHNOLOGY» призначений для студентів факультету інформатики, які прослуховують курс «Англійська мова за професійним спрямуванням», але може бути корисним для усіх бажаючих, які прагнуть вдосконалити свої знання англійської мови у галузі інформаційних технологій.

Посібник складається з дев'яти розділів (DIGITAL TECHNOLOGY TODAY, INSIDE A PC SYSTEM, INPUT DEVICES, OUPUT DEVICES, STOGARE DEVICES, OPERATING SYSTEMS, SPREADSHEETS AND DATABASES / WORD PROCESSING, PROGRAMMING LANGUAGES, RECENT DEVELOPMENTS), які охоплюють основні теми професійного спілкування в галузі інформаційних технологій та відповідають тематичному плануванню курсу «Англійська мова за професійним спрямуванням».

Посібник має на меті допомогти студентам розвивати та покращувати їхні комунікативні навички (а саме, читання, говоріння та письмове мовлення), а також поглибити їхні знання лексики (як спеціалізованої, так і загального спрямування). Відповідно кожен розділ включає автентичні тексти професійного спрямування, які доповнюються завданнями з говоріння, читання, письмового висловлення, а також лексичні вправи. Підручник розрахований як для аудиторної роботи зі студентами, так і для самостійної роботи студентів.

Отже, підручник надає можливість студентам удосконалити свої навички спілкування, що обумовлює його актуальність.

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1. DIGITAL TECHNOLOGY TODAY

PART A *AN APP FOR FOLKLORE*

1. *You are going to read an article about tablet computers. Before you read, discuss the following question:*

- What do people use tablet computers mainly for?

2. *Read the following article and find out how tablet computers are used by a tribe in the Kalahari Desert. As you read, complete the gaps (1-6) with the fragments removed from the text (A-G). These is one fragment that you do not need to use.*

Tablet computers could help villagers in the Kalahari preserve cultural knowledge for future generations

The Herero people know just what to do when a horse is too wild or unpredictable: they lash a donkey to it, which forces the horse to slow down and helps to tame it. Unruly animals have been dealt with this way for generations by the inhabitants of the small village of Erindiroukambe, which lies in the heart of the Kalahari Desert in eastern Namibia.

But times are changing and, as young men leave to work or study in cities like Windhoek, 400 kilometres away, it becomes much harder to hang on to this kind of local knowledge. Kasper Rodil, at Aalborg University in Denmark, and his colleagues want to see (1) _____. "The human race would lose some colour if we lost this kind of knowledge," says Rodil.

Typically, young men stay in the city for a few years before returning to their home village to pick up the traditional semi- nomadic lifestyle, working the land and keeping cows and goats. But this gap means that they miss out on much of the village's accumulated knowledge, (2)_____.

Along with researchers at the Polytechnic of Namibia in Windhoek, Rodil's team is working with Erindiroukambe's elders to develop a 3D visualisation of the village on a tablet computer. Their knowledge will be embedded in this virtual village to be stored for future generations. Rodil is also developing a drawing app for the tablet which mimics the way the elders draw diagrams in the sand to explain what they mean. "The idea is that we have (3) _____," he says.

It is crucial that the elders are involved in the development of such an app, says Rodil. "The participatory design is key. We don't want to just impose our ways upon people."

For villagers who had never used a computer before, the intuitive swipes and finger taps of a tablet interface (4) _____. "If this is how to use computers, then I have no problems," said one old woman who tried it out.

The 3D environment, running on an Android-based tablet and based on a 3D video games engine, shows avatars that depict the villagers as they are engaged in various tasks. Short video segments, such as the slaughtering of a goat, or the lighting of a sacred flame, pop up as floating 2D panels in the virtual village. Other links will access more general knowledge, such as which herbs can be used to treat specific ailments, how to look after animals or how to navigate between scattered villages using the sun.

Despite a few teething problems - elders complained that the colouring of the cows was not accurate enough, for example - the animations met with overall approval. "They are good in their look and in the sense that they will be kept there forever, (5) _____," said one Erindiroukambe elder.

Urban migration has disrupted how information has historically been passed down the generations, says Niall McNulty, who helps run the Ulwazi programme in Durban, South Africa. This uses digital technology to enable communities in the area (6) _____. "As mobile

devices become ubiquitous in Africa, the need for this type of regional and language-specific content, and the tangible link it provides between communities and their multiple pasts, becomes all the more important," McNulty says.

From *New Scientist*

A	and they will never be forgotten
B	if tablet computers can help bridge the gap
C	to record indigenous knowledge and history
D	as little friction as possible between the device and the user
E	proved easy to pick up
F	log in the virtual village
G	which is traditionally passed on orally by the elders

3. *Answer the following questions:*

- Why do researchers consider it necessary to help this tribe to preserve their knowledge?

- Why are tablet computers particularly suitable for this task?

- What is the reaction of the villagers?

- Do you think the researchers' efforts will be successful?

4. *Explain the meaning of the highlighted words and expressions.*

5. *Discussion/Writing:* Can you think of other specific ways to use tablets computers?

PART B *WATSON TURNS MEDIC*

1. *You are going to read an article about a supercomputer. Before you read, discuss the following questions:*

- What is a supercomputer? In what areas are supercomputers used today?

2. *Read the following article and explain what Watson is and how it operates. As you read, complete the gaps with the words given in the box.*

accuracy	accurate	artificial	data	database	filling	line	range	relay	virtual

A year on from beating humans in Jeopardy! IBM's supercomputer is learning to diagnose patients

It is more than a year since Watson, IBM's famous supercomputer, opened a new frontier for (1) _____ intelligence by beating human champions of the quiz show *Jeopardy!*. Now Watson is learning to use its language skills to help doctors diagnose patients.

Progress is most advanced in cancer care, where IBM is working with several US hospitals to build a (2) _____ physicians' assistant. "It's a machine that can read everything and forget nothing," says Larry Norton, a doctor at the Memorial Sloan-Kettering Cancer Center in New York, who is collaborating with IBM.

When playing *Jeopardy!*, Watson analysed each question in a bid to guess what it was about. Then it looked for possible answers in its (3) _____, made up of sources such as encyclopaedias, scoring each according to the evidence associated with it and answering with the highest rated answer. The system takes a similar approach when dealing with medical questions, although in this case it draws on information from medical journals and clinical guidelines.

To test the system, Watson was first tasked with answering questions taken from Doctor's Dilemma, a competition for trainee doctors that takes place at the annual meeting of the American College of Physicians. Watson was given 188 questions that it had not seen before and achieved around 50 per cent (4) _____ - not bad for an early test, but hardly ideal.

To improve, Watson is now absorbing records - tens of thousands at Sloan-Kettering alone - of treatments and outcomes associated with individual patients. Given data on a new patient, Watson looks for information on those with similar symptoms, as well as the treatments that have been the most successful. The idea is it will give doctors a (5) _____ of possible diagnoses and treatment options, each with an associated level of confidence. The result will be a system that its creators say can suggest nuanced treatment plans that take into account factors like drug interactions and a patient's medical history.

William Audeh, a doctor at Cedars-Sinai Medical Center in Los Angeles, who is working with IBM, says the last few months have involved "(6) _____ Watson's brain" with medical data. Watson is answering basic questions based on the treatment guidelines that are published by medical societies and is showing "very positive" results, he adds.

The technology is particularly useful in oncology because doctors struggle to keep up with the explosion of genomic and molecular (7) _____ generated about each cancer type. This means it can take years for findings to translate into medical practice. By contrast, Watson can absorb new results and (8) _____ them to doctors quickly, together with an estimate of their potential usefulness. "Watson really has great potential," says Audeh. "Cancer needs it most because it's becoming so complicated so quickly."

The IBM system could also approve treatment requests more quickly. At WellPoint, one of the largest insurers in the US, nurses use guidelines and patient history to determine if a request is in (9) _____ with company policy. Nurses are now training Watson by feeding it test requests and observing the answers. Progress is good and the system could be deployed next year, says WellPoint's Cindy Wakefield. "Now it can take up to a couple of days," she says. "We hope Watson can return the (10) _____ recommendation in a matter of minutes."

From *New Scientist*

3. *Answer the questions:*

- In what parts of medical science can Watson be used?

- How is Watson trained?

- How is it tested? Are the results encouraging?

4.*Discussion/Writing:*

- How can computers be used in medicine?

- To what extent can computers be 'trusted' to diagnose people and recommend treatment options?

PART C ***DO ROBOT HELP AUTISTIC KIDS? THE JURYS STILL OUT***

1. *You are going to read an article about robots. Before you read, discuss the following questions:*

- What is a robot?

- What types of robots do you know?

2. *Read the following article and find out how robots are used to help autistic kids. As you read, complete the gaps (1-12) using the words given in the left column to form words that fit in the spaces in the passage with the same number.*

FROM backflips to public debating, robots have been grasping new tasks at an (1) _____ rate of late. And one such task drawing increasing attention is helping children with autism to improve their social skills. The logic goes that robots can be programmed to be consistent in their responses, removing (2)_____ from a social exchange that some autistic people struggle with. On top of this, a robot can be tailored to respond in the way judged best for each person and programmed to (3) _____ increase the complexity of its interactions, making it a good social coach.

1 impress

2 predict

3 care

Adding (4) _____ to this idea is a new study claiming that children with autism showed improved social skills after coaching sessions from a robot. Brian Scassellati at Yale University and his colleagues arranged for nine children with autism between the ages of 6 and 12 to complete a 30-minute session with a robot every day for 30 days. The robot helped the children to play touchscreen games designed to teach (5) _____and social understanding. For example, in one game the robot would tell a story and ask the child to choose what they think different characters on the screen were feeling. The difficulty was increased to cater for the child's progress – the (6) _____became longer and more complex. Throughout the tasks, the robots would maintain eye contact with the child to show (7) _____or look at the screen when the child was doing the same. The sessions were conducted with caregivers at home. Scassellati's team found that after the experiment the children had improved social skills. An improvement was still (8) _____a month later. "The hope of this is that robots might provide a cost-effective, fun and engaging therapy," says Scassellati. However, like many studies looking at robots and autism, the number of (9)_____is so small that it is hard to draw any definitive conclusion. "The absence of studies with large samples makes it very difficult to know whether any one of the current robotic systems 'works' for autistic children, and what it 'works' on and why," says Liz Pellicano at Macquarie University in Sydney, Australia. In medicine, randomised controlled trials have long been the gold-standard for testing (10) _____. In the case of using robots, this would involve randomly putting children into two groups. One would complete the robot coaching and the other would do something similar without the robot. That way any differences that show up between the groups can be attributed to each method. "What we want to know is whether this sort of robot-assisted interaction is at least as good as or even better than a human-led interaction – and, in particular, for which sort of children, since robots won't (11)_____appeal to every autistic child," says Pellicano.

4 credit

5 emotion

6 narrate

7 engage

8 evidence

9 participate

10 intervene

11 necessity

But in this study, and many others, there was no control group, making it difficult to determine if the changes seen were simply the result of trying something new or due to the robot. Scassellati and his colleagues recognise

many of the shortcomings and say that they want to introduce (12) _____and control groups, as well as extending the study length. Robots could be excellent social coaches for children with autism, but unfortunately nobody has yet done the studies to really find out. 12 random

From *New Scientist*

3. *Answer the questions:*

- Why can robots be especially effective when working with autistic children?

- Are researchers totally confident of robots' efficiency? Why/Why not?

4. *Discussion/Writing:*

- Can you think of other areas of medicine in which robots can be useful?

PART D *VISION RESRORED WITH VIRTUAL REALITY*

1. *You are going to read an article about using digital technologies to help people with disabilities. Before you read, discuss the following questions:*

- What are different types of disabilities?

- What are the conventional ways of helping such people?

2. *Read the following article and explain how virtual reality can help blind people. As you read, complete the gaps with the words given in the box.*

adjusting	**all-in-one**	**boost**	**conditions**	**customised**	**device**
eliminate	**experiences**	**headset**	**interact**	**magnification**	**perceive**
		software	**vision**	**VR headset**	

A VIRTUAL reality headset has restored sight to people who are legally blind. While it didn't cure the physical cause of their blindness, the (1) _____ let people with severe macular degeneration resume activities like reading and gardening – tasks they previously found impossible.

Macular degeneration is a common, age-related condition. It affects around 11 million people in the US and around 600,000 people in the UK. Damage to blood vessels causes the central part of the eye, called the macular, to degrade. This leaves people with a blind spot in the centre of their (2) _____ and can make those with the condition legally blind. "You can still see with your periphery, but it's difficult or impossible to recognise people, to read, to perform everyday activities," says Bob Mass of at Johns Hopkins University.

The new system, called IrisVision, uses VR to make the most of peripheral vision. The user puts on a (3) _____that holds a Samsung Galaxy phone. It records the person's surroundings and displays them in real time, but the user can magnify the image as many times as they need for their

peripheral vision to become clear. Doing so also helps to effectively reduce or (4) _____their blind spot.

"Everything around the blind spot looks, say, 10 times bigger, so the relative size of the blind spot looks so much smaller that the brain can't (5) _____it anymore," says Tom Perski at IrisVision, who also has severe macular degeneration. When he first started using the device it was an emotional experience. "I sensed that I could see again, and the tears started coming," he says. "If I were to look at my wife – and I'm standing 4 or 5 feet away – my blind spot is so large I can't see her head at all," says Perski. But when he uses IrisVision the (6) _____causes the blind spot to be relatively much smaller, so that it no longer covers his wife's whole head, just a small part of her face. "If I just move that blind spot, I can see her whole face and her expression and everything," he says.

The software also automatically focuses on what the person is looking at, enabling them to go from reading a book on their lap to looking at the distance without (7) _____the magnification or zoom manually. Colours are given a (8) _____because many people with macular degeneration have trouble distinguishing them, and users can place a magnification bubble over anything they want to see in even more detail, for example to read small print.

In a trial, 30 people used the system for two weeks, filling out questionnaires on their ability to complete daily activities before and after the period. "They can now read, they can watch TV, they can (9) _____with people, they can do gardening. They can do stuff that for years was not even a consideration," says David Rhew at Samsung Electronics. According to Rhew, the vision of participants was all but restored with the (10) _____. "The baseline rate of vision in the individuals came in at 20/400, which is legally blind, and with the use of this technology it improved to 20/30, which is pretty close to 20/20 vision," he says.

The headset is now being used in 80 ophthalmology centres around the US, and the next step is to adapt the (11) _____to work for other vision disorders. Melissa Chun, at the Stein Eye Institute at the University of California, Los Angeles, is one of those who has been working with the system. "My patients who have used it like that it is an (12) _____. They read with it, watch television, see faces of friends and family," says Chun, although some have commented that it is heavy for long periods of use. Many people with macular degeneration regularly use eight to 10 different tools, such as telescopes and magnifying glasses, to help them with daily life, but IrisVision can replace them all, says Perski. The system costs $2500, which includes a Samsung Gear VR headset and a Galaxy S7 or S8 smartphone (13) _____with the software.

In previous work, Samsung has used the headset to help treat people with chronic pain using immersive virtual reality (14) _____such as swimming with blue whales or painting. Some of the participants continued to feel the effects up to 48 hours after they stopped using the device. "Maybe down the road we may have to create a VR pharmacy, based on different content for different people with difference (15) _____," says Rhew.

From *New Scientist*

3. *Answer the questions:*

- What suggestion is suggested to help blind people? How does it work?

- How do experts assess the results? What is the feedback from the patients?

4. *Discussion/Writing:*

- Do you know how devices can be used to help people with other kinds of disabilities?

PART E *NEW APPLE WATCH'S POTENTIAL RISKS?*

1. *You are going to read an article about smart watches. Before you read, discuss the following question:*

- What is a smart watch? What are its basic features and what are their functions?

2. *Read the following article and find out how Apple Watch can be used in home healthcare. As you read, complete the gaps (1-10) with the fragments removed from the text (A-J).*

The new Apple Watch is billed as a leap in home healthcare, but is it?

THE latest Apple Watch will give people warnings if their heart rate goes too high or low and let them take a read-out of their heart's electrical activity. It is being billed as a giant leap in home healthcare – but critics say it will lead to huge numbers of people getting told they have heart problems (1) _____. Apple calls its Series 4 watch "an intelligent guardian for your health".

An electrocardiogram (ECG) is usually just available in hospital. Pads (2) _____ detect your heart's electrical activity, which is shown as the well-known spiky lines on a monitor. Now Apple Watch users will be able to get an ECG (3) _____, by putting a finger on the watch's side. After 30 seconds, you get told if the result is normal or suggests a problem. The recording can be shared with a doctor.

Having the function built into the watch will mean many people will start regularly taking their ECG, especially if they worry about their health – and that is (4) _____, says Venkatesh Murthy at the University of Michigan.

The feature will be useful for some people who need home monitoring, namely those who have a condition called atrial fibrillation, (5) _____. This causes symptoms such as breathlessness, tiredness and chest pain, and puts people at risk of a stroke.

But many people can have an irregular heart rhythm without symptoms. They will be told by their watch to take the ECG result to a doctor. They could then go on medications such as blood thinners, which can trigger bleeding (6) _____. It is unclear whether there is any benefit from treating symptomless atrial fibrillation. Even if doctors advise no treatment, people will be falsely alarmed, says Murthy.

Several trials have investigated (7) _____ to people without symptoms. The US Preventive Services Task Force has concluded that the evidence fails to show this approach does more good than harm.

New Scientist has asked Apple if the company has any specific measures to avoid misdiagnosis, (8) _____. Another function, the intermittent heart rate monitor – which works through sensors built into the back of the watch face – may also have potential for false alarms. For example, people (9) _____ could be wrongly sent a notification saying that their heart rate is too low.

"Your heart rate naturally falls when you are relaxed or sleeping. Is that going to set off an alarm? They haven't released the data," says Murthy.

And there is a third new medical feature. This will call emergency services if the wearer is detected to have taken a hard fall and (10) _____.

All such functions will no doubt be appreciated by people with health concerns – not to mention the worried well.

From *New Scientist*

A whether it is helpful to give ECGs	**F** where the heart beats irregularly
B at the touch of a button	**G** when they don't
C but has yet to receive a response	**H** as a side effect
D put onto your body	**I** where the problems may start
E stays immobile for 60 seconds	**J** who are very fit

3. *Answer the following questions:*

- What are the potential risks of using Apple Watches in home healthcare?

- In your opinion, are the experts' concerns justified?

4. *Discussion/Writing:*

- Do you use a smart watch to monitor your health?

PART F *NEW APPLE WATCH MONITORS BLOOD OXYGEN – IS THAT USEFUL?*

1. *You are going to read an article about using smart watches to monitor blood oxygen. Before you read, discuss the following question:*

- Why is it necessary to monitor blood oxygen? How is it measured?

2. *Read the following article and find out whether it is useful to use smart watches to monitor blood oxygen levels. As you read, complete the gaps (1-19) with one suitable word.*

APPLE'S recently released Series 6 smart watch has a new (1) _____: it can measure blood oxygen levels. The tech (2) _____have been years in the making, but the timing of its release worked well given that we are in the middle of a global respiratory pandemic.

The amount of oxygen in the blood is important medical information. In hospitals, it is usually measured (3) _____a device called a pulse oximeter, which shines a light through the finger or earlobe. Blood carrying more oxygen absorbs (4) _____differently. It is already possible to buy a fingertip pulse oximeter for use at home for about £20. Now Apple says it has replicated this function in its high-tech watch, which shines a light onto the back of the wrist and measures the light reflected back with embedded (5) _____. The user must keep their arm still for 15 seconds. The device also takes periodic readings when the person happens to be still, day and (6) _____.

In a press statement, Apple was vague about the purpose, saying it offers "insight into overall wellness", and didn't answer New Scientist's requests for (7) _____ details. A spokesperson couldn't share any published research showing how oxygen monitoring (8) _____help a typical healthy person. But tools to track personal health may (9) _____to the fore as the coronavirus pandemic continues. Home oxygen monitoring is in no way a test for covid-19, yet it could help those (10) _____ have already been diagnosed and are not sick enough to be in hospital but want reassurance about their condition. Some UK clinics are piloting "virtual wards", (11) _____ people who might otherwise be admitted to hospital stay home and do phone check-ups, and pulse oximetry is a key part of their monitoring.

Other conditions could benefit from home (12) _____monitoring, such as chronic obstructive pulmonary disease, a long-term lung condition that can cause a need for supplementary oxygen.

The night-time monitoring could help to alert people about sleep apnoea, when they have problems breathing (13) _____night, usually due to being overweight. This can cause people to wake up when their blood oxygen gets too low, although they may not be aware of how (14) _____their sleep is being disturbed.

Because most pulse oximeters are applied (15) _____the finger or earlobe, it is unclear how well this new method will compare. "Even highly accurate devices sometimes give erroneously low readings when people's hands are cold", says Andy Whittamore, clinical lead for Asthma UK and the British Lung Foundation. "There are a few gaps there in (16) _____of how we interpret this device," says Whittamore. Even Apple says in the small print on its press statement that the oxygen measurements are "not intended for medical (17) _____, including self-diagnosis or consultation with a doctor, and are only designed for general fitness and wellness purposes". (18) _____the firm releases data on the accuracy of the watch's readings, it is hard to know how useful it will be. "If we (19) _____the device was absolutely robust and accurate, then there would be a place for it," says Whittamore.

From *New Scientist*

3. *Answer the following questions:*

- How does new Apple watch monitor blood oxygen levels?

- Why might not it be useful for people to use smart watches for this purpose?

4. *Match the highlighted words with the meanings below:*

- numbers or amounts shown on a measuring instrument

- unclear, not give enough detailed information

- a warning to be ready for possible danger

- making something officially available

- incorrectly

- to try to get the same result again

5. *Discussion/Writing:*

- Do you think it is ethical for companies to offer services that are not medically accurate?

- Do you think ordinary people should perform such procedures as measuring blood oxygen level themselves without professional supervision?

2. INSIDE A PC SYSTEM

PART A *IT'S A GREAT TIME TO BUILD YOUR OWN PC*

1. *You are going to read an article about building a PC oneself. Before you read, discuss the following question:*

- Have you built your PC, or have you purchased a pre-built machine? Explain your choice.

2. *Read the following article and find out the author's opinion on this subject. As you read, complete the gaps (1-14) with one suitable word.*

SOMETHING STRANGE has just happened in the PC market. Something that bucks the trend. The decline in PC sales that we've seen since 2011 (1) _____ experienced a hiccup. Just for a change, we saw a small increase for the second quarter of 2018 compared (2) _____ the previous year. It's subtle, and it may not signify a major shift, but it could turn out to be the start of something bigger.

To throw some figures behind this, according to Gartner, the second quarter of 2018 saw the likes of HP. Dell, and Lenovo ship 14.51 million PCs across the United States. Compare that with the 14.26 million for the (3) _____ time frame the previous year, and you're looking at growth of 1.7 percent. This is echoed to a lesser extent by the global market, (4) _____ saw a 1.4 percent rise from 2017 s 61.3m shipments up to 62.1m for 2018.

While this is good news for the health of the PC as a whole—and should help keep pricing in check, among other things—there are a (5) _____ important things that these figures don't capture. They don't include anyone upgrading their systems, the growth in relatively niche areas—such as high-end systems and gaming PCs—and. importantly for this month's intro, machines that users have built (6) _____.

Building your own machine is a rite of passage for many users. Even if you later return to whole system purchases, the process of building your (7) _____ rig is an invaluable exercise in terms of understanding how machines are put together. It shows you what your money actually buys, where the extra time and effort needs to be spent to turn a perfectly functional system (8) _____ something you (9) _____ cherish and puts value behind any component you use. We heartily recommend building a PC at least once in your life.

This issue, we show you how to build a budget gaming system that punches well above its weight. And we do so in a level of detail that we haven't done before: every connection, every screw, every decision, and every process is covered in intricate detail, to make sure nothing can go (10) _____. If you've never undertaken a system build before, this guide is for you. Alternatively, if you have a friend who (11) _____ benefit from such a guide, please pass this issue on to them (once you've finished reading it yourself, of course), and see what they can produce.

The final machine is an impressive system in its own right, more than capable of handling the vast majority of common tasks. With a few choice upgrades as you go, there's no (12) _____ that it couldn't stay with you for years to (13) _____. Or if you need more power right now, you can tweak the specification from the start and build a PC that hits your sweet spot straight away.

On a final note, if you have any tips or experiences, you'd like to share with your fellow readers, please (14) _____ us a line to the email address below, and we'll share them on our letters page. Happy building!

From *Maximum PC*

3. *Answer the following questions:*

- What is the author's opinion about building a PC oneself?

- What advantages of building one's own rig does the author mention?

- What disadvantages of building one's own rig are discussed in the article?

4. *Match the highlighted words and expressions with the meanings below:*

- be successful in an activity or task which usually needs more money, power, skill etc than people seem to have

- the most expensive or advanced systems

- to make small changes to a machine, vehicle, or system in order to improve the way it works

- repeat an idea or opinion because you agree with it

- a special ceremony or action that is a sign of a new stage in someone's life

- small problem or delay

- the particular situation, quality, combination of things, etc. that is the best or most effective possible

- a market for a product or service, perhaps an expensive or unusual one, that does not have many buyers, but that may make good profits for companies that sell it

- a desktop computer, especially a custom-built one

5. *Discussion/Writing:*

- Do you think it is better to build a PC yourself? What are the possible advantages and disadvantages?

PART B *HOW MANY CORES AND THREADS DO WE NEED?*

1. *You are going to read an article about cores and thread. Before you read, discuss the following questions:*

- What is a core? What is a thread?

- How many cores and threads do average computers have and why?

2. *Read the following article and find out the author's answer to the question in the headline. As you read, decide which of the sentences given below (A-H) fit into the gaps in the text (1-7). There is one sentence that do not need to use.*

OK, AMD, YOU WIN: All the cores and threads belong to you. What started with Ryzen several years ago has culminated in a monstrous 64-core/128-thread chip, double what was available in the previous second-gen Thread ripper parts. They easily eclipse anything Intel has to offer.

There's only one small problem: Most of us really don't need this many cores or threads.

Threadrpper 3990X is a chip built with specific workloads in mind. (1) _____ I'm not talking about the slightly lower clock speeds either.

The 3990X takes AMD's currently largest Epyc design, disables half of the eight memory channels, then wraps it up in a 'consumer' package. Except, with a price of $3,990, plus the need for more RAM and a very high-end motherboard, this takes the HEDT (high-end desktop) market to new extremes. (2) _____ More specifically, it's built for professionals who do a lot of 3D rendering

You might think just about any multithreaded workload would run better on the 3990X than the 3970X — twice as many cores can't be bad, right? However, due to the way Windows 10 was built, you end up with two groupings of 64 threads in Task Manager and scheduling of workloads across those groupings does not always work as expected.

Video encoding doesn't really know what to do with the 3990X. HandBrake is barely any faster with x264 encoding and is slightly slower in x265 mode. (3) _____ There are numerous lighter applications where the 64-core behemoth falls well behind other CPUs — including tasks such as gaming, general Internet use. and office work.

But then you get to 3D rendering and fire up Blender with a complex scene, and suddenly all those cores are put to good use. Blender, Cinebench R20, V-Ray, POV-Ray, and Corona all have the 3990X beating the 3970X by 45-65 percent. (4) _____

Now that 64-core CPUs are becoming more affordable, we should see app — and Windows — support for such chips improve as well. (5) _____ Windows has already moved away from a per-socket fee to a per-core fee. VMware recently announced two tiers of pricing as well: one for up to 32 cores, and you'd buy a second license for each additional 32 cores Oracle has been charging per core for a long time, too.

I'm not saying we'll never need a 64-core CPU in our home PCs, but it could be decades before such systems become common. (6) _____ Still, something has to do the heavy lifting for Hollywood, not to mention the servers behind all the smartphone networks...

Even so, I wonder what AMD has planned. Zen gave us 16-core Threadripper 1950X, Zen+ delivered 32-core Threadripper 2990WX, and now Zen 2 drops a 64-core bombshell on the 3D rendering community. (7) _____ Possibly, though doubling down yet again might not deliver the hoped-for performance. We are well past the point of diminishing returns.

From *Maximum PC*

A It's not for home users, or even enthusiasts — it's built for professionals.
B The 3990X has eight CPU chiplets and 10 die beneath its heat spreader.
C Not surprisingly, AMD's marketing behind the Threadripper 3990X was heavy on the Hollywood-style 3D rendering.
D And if you're not using one of those workloads, performance can actually be worse than its "little brother" 3970X, which has half as many cores and threads.
E But there's another problem with higher core counts: software licensing fees.
F Will we see 128-core or even 256-core chips?
G Or maybe they never will, considering the rise in smartphone use for media consumption, email, and more.
H Adobe Photoshop and Premiere Pro are both faster on a 397OX.

3. *Answer the following questions:*

- How many cores/threads do the chips discussed in the article have? What possibilities do they provide for users?

- According to the article how many cores and threads 'do we actually need'? Why is the author sceptical about the recent achievements in chip manufacturing?

4. *Discussion/Writing:*

- How many cores/threads does your computer have? Would you like to have more? Why/why not?

PART C *BLUEPRINT: TURBO BUILDS*

1. *You are going to read an article about the components of a PC. Before you read, discuss the following question:*

- Name all components of a PC and their functions.

2. *Read the following article and find out what parts are used to build the AMD machine and the Intel machine. As you read, complete the gaps in the tables with the information from the article.*

A part-by-part guide to building a better PC

Before we get into the nitty-gritty of this: at the time of writing, *Death Stranding* on PC is free with both of the EVGA 2080 Supers we're using in these two builds (the KO Gaming in the AMD build, and the Black Gaming in the Intel build). Snap that up! Anyway... high-end power supplies seem to be stabilizing somewhat in the price department, so we'd recommend grabbing a Corsair RM850x at just $165 before the price rises again. You can see the same PSU in both turbo builds this issue.

In the AMD machine, we've upgraded our motherboard to the excellent MSI MEG X570 Unify. Some dedicated readers among you may remember this as one of the first X570 mobos we got our hands on, and it's still a great choice for any 3rd-gen Ryzen build. We've also swapped out our memory, sticking with G.Skill's TridentZ range, but now opting for the newer, flashier TridentZ Neo. As we mentioned earlier, we're using EVGA's RTX 2080 Super KO Gaming in this machine now. Lastly, the 1TB model of the Corsair Force MP600SSD is no longer the most affordable option for a 1TB PCIe 4.0 drive; Patriot has come in strong with the Viper Gaming VP4100, providing up to 5GB/s transfer speeds for just shy of $200.

The Intel system is getting a far more concrete improvement this month: a shiny new CPU, with the Intel Core i9-10900K. This is selling fast, but hopefully will be restocked by the time you read this. With 20 threads across 10 cores clocked up to 5.3GHz, this should show a solid performance boost when combined with the new Asus ROG Strix Z490-E Gaming motherboard. Fortunately, the LGA-1200 socket is compatible with LGA115X coolers meaning we have plenty of choice for coolers. That said we've gone for Fractal Design's Celsius-»- S28 Dynamic X2 AID cooler, which sports an omni-compatible CPU bracket. Finally, a tasty $60 discount on the Samsung 970 Evo Plus made a very persuasive argument for changing up our SSD. This drive effectively offers the fastest SSD storage available on Intel platforms, at least until Intel introduces PCIe 4.0 compatibility with its future processors.

From *Maximum PC*

AMD INGREDIENTS		
PART		*PRICE*
Case	NZXT H710i	$170
PSU	(1) _____	$165
Mobo	(2) _____	$300
CPU	AMD Ryzen 9 3950X	$700
Cooler	Corsair iCUE H115i RGB Pro XT 280mm	$140
GPU	(3) _____	$730
RAM	32GB (2x16GB) G.Skill TridentZ Neo @ 3600MT/s	$179
SSD	1TB (4) _____ VP4100 M.2 PCIe SSD	$199
HDD	6TB Seagate BarraCuda ST6000DM003 HDD	$130
OS	Windows 10 Homes 64-bit OEM	$100
Approximate Price		**$2,813**

INTEL INGREDIENTS		
PART		*PRICE*
Case	NZXT H710i	$170
PSU	(5) _____	$165
Mobo	(6) _____	$300
CPU	Intel Core I9-10900K	$550
Cooler	(7) _____	$151
GPU	(8) _____	$730
RAM	32GB (2x16GB) Corsair Vengeance RGB Pro @ 2,666MT/s	$148
SSD	1TB Seagate BarraCuda 510 M.2 PCIe SSD	$190
HDD	6TB Seagate BarraCuda ST6000DM003 HDD	$130
OS	Windows 10 Homes 64-bit OEM	$100
Approximate Price		**$2,634**

3. *Answer the following questions:*

- When building these machines, which parts have been replaced and which parts have remained the same?

- In your opinion, to what extent have the machines been improved?

- Which of these systems (AMD or Intel) is better? Which one would you choose?

4. *Discussion/Writing:*

- Are these machines greatly different form your computer? Which parts of your computer would you like to upgrade?

PART D *DELL'S ULTRA MINI-PC FITS INTO A MONITOR STAND*

1. *You are going to read an article about mini-PCs. Before you read, discuss the following questions:*

- What is a mini-PC? What are its possible advantages? And disadvantages?

2. *Read the following article and find out the specs and features of the mini-PC in question. As you read, complete the gaps (1-14) with one suitable word.*

It's so skinny, you can barely tell it's there.

The Dell OptiPiex 7070 Ultra answers a prayer. This long, slender mini-PC slides into the back of a monitor (1) _____, creating the first all-in-one that's modular and upgradable.

Officially, it's designed for corporate desk jockeys needing to de-clutter their open-office workspaces. Anyone who's had to junk an entire all-in-one PC because one component (2) _____ died, however, understands why we're so excited (3) _____ this design.

Due to ship on September 24, the OptiPiex 7070 Ultra will have what Dell calls an "average price" of $749. Remember, it's modular, so the (4) _____ will depend on what you buy with it.

The primary decision is which base to get with the mini-PC- it has to mount to something. The compatible (5) _____ are a fixed-height and height-adjustable stand, plus an offset VESA mount that lets you attach it to the back of any VESA-compatible display. Prices for these (6) _____ were not available before the announcement.

I practiced taking the PC in and out of its bracket in the height-adjustable (7) _____. The mechanics are slightly finicky, but once you get the hang of it, it's easy - almost fun-to slide it in and (8)_____.

Of course, you '1l need a monitor or three (that's the max it can support), keyboard, and mouse - but you may already have these components ready to fill out the setup. Modularity is a (9) _____ thing.

OPTIPLEX 7070 ULTRASPECS AND FEATURES

The OptiPiex 7070 Ultra is a very small PC. Dell packed a lot into its slim design, with an emphasis on mainstream productivity and a lot of connectivity. However, you also have a bit of internal upgradability. Here are the (10) _____:

Dimensions: 3.78 x 10.09 x 0.78 inches

Weight: 1.43 pounds

CPU options: All8th-gen core, from the Core i3-8145U to the Core i7-8445U

Graphics: lntel UHD 620

Memory: Two memory (11) _____ take anything from 1 x 4GB DDR4 2,400MHz RAM, to 2 x 32GB (64GB total).

Storage: Your primary drive can be either a 2.5-inch SATA drive (500GB to lTB capacity), including a 500GB self-encrypting drive; or anM.2 2230 SSD in capacities (12) _____ from 128GB to lTB, or a 256GB self-encrypting drive. You can add a second 2.5-inch (13) _____ drive through an accessible bay.

Networking: 802.11ac with MU-MIMO, gigabit ethernet

Ports: The generous quintet of USB ports includes two US B-C that offer DisplayPort Alt Mode to connect directly to a monitor. One of those ports also supports Power Delivery, so it can power a display (14) _____ the connection.

AN ALL-IN-ONE THAT GIVES YOU CHOICES

Dell's OptiPiex Ultra shows a new path for all-in-ones, where you aren't stuck (15) _____ your configuration until the bitter end. This is starting at the high end for a reason-it's expensive to implement - but we hope someday that mainstream consumers may have (16) _____ to these choices.

From *PC World*

3. *Answer the following questions:*

- What are the specs and features of this ultra mini-PC?

- In what way is it different from other mini-PCs?

- Who is this computer designed for?

4. *Explain the meaning of the highlighted words and expressions.*

5. *Discussion/Writing:*

- Would you like to have a min-PC? Why/Why not?

3. INPUT DEVICES

PART A *THE BEST KEYBOARDS IN 2020*

1. You are going to read an article about keyboards. Before you read, discuss the following questions:

- What types of keyboards do you know? Explain their differences.

2. *Read the following article and find out what features make these keyboards better than others. As you read, answer the questions below the article:*

8 - HYPERX ALLOY CORE RGB

HyperX clearly decided to flex with the Alloy Core RGB, delivering an effective membrane keyboard that looks great for under 50 bucks.

7 – LOGITECH G PRO X

The G Pro X might appear at first glance to be feature-light, but the inclusion of easily swappable key switches for physical customization is brilliant.

6 - CORSAIR K63 WIRELESS

Corsair's high build quality and style make for an excellent wireless keyboard, complete with Cherry MX Red switches and a soft rubber wrist rest.

5 - DAS KEYBOARD 4 PROFESSIONAL

Functionality over frills. No key backlighting or dinky touchscreens here, just a solidly designed keyboard, perfect for typists who prefer mechanical keys.

4 - STEELSERIES APEX PRO

A sleek deck with RGB lighting, a tiny OLED display, and incredible customization, thanks to complete actuation point adjustment on a per-key basis using SteelSeries's own software.

3 - COOLER MK850

Master might not A be known for its keyboards, but the MK850 is a high-quality mechanical keyboard with all the usual bells and whistles, plus its unique analog key technology.

2 - CORSAIR K95 RGB PLATINUM

One of the best mechanical keyboards around, this oozes quality. It’s big, expensive setup, with dedicated media controls and textured WASD keycaps. We love it.

1 - RAZER HUNTSMAN ELITE

With Razer's optomechanical switches, this has near-instantaneous key response. Using light instead of physical contact pieces means keys are twice as durable as traditional ones.

From *Maximum PC*

Which of these keyboards:

- has keys that work two times longer than traditional ones?

- is not as simple as it seems?

- can be modified to suit your needs?

- demonstrates the importance of functionality over additional features?

- is produced by a manufacturer that is known for making other components?

- has the quickest key response?

3. *Answer the following questions:*

- What makes those keyboards so attractive?

- Which one of them would you like to have?

4. *Discussion/Writing:*

- What kind of keyboard do you have and why?

- Compare different input devices (keyboards, touchpads, touch screens, etc.): what are their advantages and disadvantages?

PART B *HYPERX ENTERS THE STREAMER MIC MARKET*

1. *You are going to read an article about a microphone. Before you read, discuss the following questions:*

- Have you got a microphone? Is it expensive? Is it professional?

2. *Read the following article and explain what distinguishes the QuadCast from its competitors. As you read, complete the gaps (1-11) with the words given in the box.*

mute control	**gaming mics**	**shock mount**
swingarm mic	**mic stand adapter**	**omnidirectional pattern**
gaming headsets	**high-end equipment**	**frequency response**
spec sheet	**peripheral makers**	**studio mics**

Ten years ago, if someone had told you that gaming (1) _____ would one day move into production of high-end gamer-branded microphones, you'd have had a pretty hard time joining the dots. To the older generation it doesn't seem so long ago that a (2) _____ on a headset was considered a luxurious boon.

But the advent of YouTube and Twitch have changed the face of gaming in many ways. For those who stream themselves playing, it's essential to offer their audience the clearest audiovisual experience possible. And for those who watch those who stream themselves playing, that (3) _____is deeply aspirational. So here we are with a $140 USB microphone on our desk.

And let's get this out of the way: a very good one it is, too. The (4) _____ doesn't really tell that story, though — there isn't much to distinguish the QuadCast from its competitors, such as the almighty Blue Yeti or Razer's Seiren series mics, when it comes to (5) _____ (an ample 20Hz-20kHz) or sample and bitrate (CD-quality 48kHz/16-bit).

Indeed, since we aren't generally as well trained at spotting great mic attributes in the gaming community as a great graphics card, the suspicion might be that perhaps (6) _____ are simply cheaply produced and low-quality studio mics, but that's not the case. The QuadCast really is suited to gaming.

That’s because of the little details. First is that it’s supplied with a shock mount, which keeps the microphone itself from picking up every little knock and scratch from your desk. It might sound like a minor point, but if you’ve ever imposed the red light of terror on yourself and streamed live, you know how much of a difference it makes. There’s also a (7) _____ included, so you can set the QuadCast up on a boom arm above yourself or to one side.

The controls are also perfectly suited for gaming. We particularly enjoy the touch-sensitive (8) _____ positioned at the top of the mic. Just a tap and it's muted or back on without any of the clicks or pops that often creep in when a mechanical switch operates the mute function. And if you were in any doubt, there’s a red light that lets you know whether the microphone's on or not. Controlling the gain is also simple enough to achieve mid-stream via a dial at the bottom of the mic. Again, it’s free of pops and crackles.

It’s also nice to have the option of a few different polar patterns, although you'll generally want to stick to the narrower pattern for solo streaming, to avoid picking up background noise. The stereo option is handy for podcasting with one other person, and the (9) _____ can handle groups of more than two, although background noise does naturally increase as a result. In ‘solo’ configuration in particular, the recording and broadcasting sound quality is really exceptional, easily on a par with similarly priced (10) _____ at recreating vocals. Sibilant sounds are captured brilliantly, and the high end is noticeably detailed— it’s lacking the warmth of pricier studio mics, but you’d expect that from a sub- $200 USB mic aimed at gamers.

And thus, our only real reservation with the QuadCast isn't specific to the product at all, but gaming microphones as a ’prosumer’ prospect. Investing in an XLR audio interface and a studio mic yields better results and more options for home recording, and although the QuadCast makes the best case yet for choosing an option tailor-made for gaming, with its easy controls, from a consumer standpoint, it’s still less desirable than a pro audio solution. Still, HyperX’s mic is a galaxy away from the swingarm mics on (11) _____. For the vast majority of users, that'll be enough to warrant a place for that shock mount on their desks.

From *Maximum PC*

3. *Answer the following questions:*

- What makes this microphone better compared to its competitors?

- How are the prospective buyers of the QuadCast?

- What is the author’s only reservation about this microphone?

- What does the word ’prosumer’ used in the article mean?

4. *Discussion/Writing:*

- How much money are prepared to spend on a microphone? And why?

PART C *SMILE, YOU'RE ON BODY CAM*

1. *You are going to read an article about cameras. Before you read, discuss the following questions:*

- Have you got a camera? How often do you use it and what for?

2. *Read the following article and explain the subheading. As you read, complete the gaps (1-11) with the words given in the box.*

algorithms	**argument**	**body-cam**	**body cams**	**data**	**evidence**
feeds	**footage**	**headcams**	**interactions**	**smartphones**	

Filming everything all the time may not be such a great idea.

IF EVERY public interaction were filmed, would the world be a better place? Common sense suggests it would, but common sense is an unreliable guide to human behaviour. The law of unintended consequences is often more useful.

To some extent, we already live in such a world, with CCTV cameras everywhere and (1)_____ in every pocket. But the routine filming of everyday life is about to go to the next level. A number of countries are rolling out (2) _____ for police officers; other public-facing agencies such as schools, councils and hospitals are also experimenting with cameras for their employees. Private citizens are getting in on the act too: cyclists increasingly wear (3) _____ as a deterrent to aggressive drivers.

As camera technology gets smaller and cheaper, it isn't hard to envisage a future where we're all filming everything all the time, in every direction.

Would that be a good thing? There are some obvious potential upsides. If people know they are on camera, especially when at work or using public services, they are surely less likely to misbehave. The available (4) _____ suggests that it discourages behaviours such as police brutality. Another upside is that it would be harder to get away with crimes or to evade blame for accidents.

But a world on camera could have subtle negative effects. The deluge of (5) _____ we pour into the hands of Google, Facebook and others has already proved a mixed blessing. Those companies would no doubt be willing to upload and curate our body-cam data for free, presumably with the assistance of machine learning (6) _____ – but at what cost to privacy and freedom of choice?

Body-cam data could also create a legal minefield. Disputes over the veracity and interpretation of police (7) _____ have already surfaced. Eventually, events not caught on camera could be treated as if they didn't happen, like the proverbial tree falling in the forest. Alternatively, footage could be faked or doctored to dodge blame or incriminate others.

Of course, there's always the (8) _____ that if you're not doing anything wrong, you have nothing to fear. But most people have done something embarrassing, or even illegal, that they regret and would prefer hadn't been caught on film. People already censor their social media (9)_____ – or avoid doing anything incriminating in public – for fear of damaging their reputation. Would ubiquitous body cams have a further chilling effect on our freedom?

The always-on-camera world could even threaten some of the attributes that make us human. We are natural gossips and backbiters, and while those might not be desirable behaviours, they oil the

wheels of our social (10) _____. Once people assume they are being filmed, they are likely to clam up.

The argument in relation to (11) _____ ownership is a bit like that for guns: once you go past a critical threshold, almost everyone will feel they need one as an insurance policy. We are nowhere near that point yet – but we should think hard about whether we really want to say lights, body cam, action.

From *New Scientist*

3. *Answer the following questions:*

- To what extent are cameras used in our world today?

- What are the potential upsides of the routine filming of everyday life?

- What negative effects could 'a world on camera' have?

4. *Explain the meaning of the highlighted words and expressions.*

5. *Discussion/Writing:*

- 'Filming everything all the time is not a good idea' – do you agree? Why/why not?

PART D *8 BEST WEBCAMS*

1. *You are going to read an article about wecams. Before you read, discuss the following questions:*

- What features does you camera have?

2. *Read the following article and find out what features make these webcams better than others. As you read, complete the gaps (1-13) with one suitable word.*

8 - RAZER STARGAZER

A depth-sensing webcam that supports nifty features (1) _____ as head-tracking, this is a camera for the professional streamer looking for high-end hardware. Sadly discontinued by Razer, but (2)_____ available online.

7 - LOGITECH C310

A cheap and cheerful option, the Logitech C310 is a great choice if you're just a casual webcam (3) _____, only interested in the occasional Skype call to Mom and Pop.

6 - CREATIVE LABS BLASTERX SENZ3D

The most expensive webcam here, Creative Labs' BlasterX uses three lenses and Intel's RealSense tech to respond to facial (4) _____ and body gestures.

5 - LOGITECH BRIO ULTRA HD

Essentially the polar opposite of the C310 above, the Brio is Logitech's high-end (5) _____. Perfect for streamers, it comes packing background-replacement technology and 60fps (6) _____.

4 - ANIVIA W8

Frequently (7) _____ sale, the fun-size W8 is a good general-purpose webcam. It's almost suspiciously simple to set up and use, too. It's also a solidly (8) _____ device.

3 - MICROSOFT LIFECAM HD-3000

With a noise-canceling microphone and miniature design, the HD-3000 is a great budget offering (9) _____ Microsoft. It easily attaches (10) _____ both laptop screens and desktop monitors as well.

2 - RAZER KIYO

The ideal webcam for professional streamers, the Kiyo comes equipped with a ring light, (11)_____ that your thousands of fans can see you even in the gloomiest gaming room.

1 - LOGITECH C920

Logitech is dominating this list, in (12) _____ you didn't notice. A great middle-ground webcam, the C920 (13) _____ good performance without a demanding price point. It's often on sale, too.

From *Maximum PC*

3. *Answer the following questions:*

Which camera(s)

- is/are good for professional streamers?
- is/are good for casual webcam users?
- is/are the most expensive?
- is/are a great budget offering?
- is/are often on sale?
- is/are the smallest?
- is/are very simple to set up and use?
- has/have special features?

What company is dominating this list?

4. *Discussion/Writing:*

- What are the most important features of a webcam?

PART E *KINECT CAMERAS*

1. *You are going to read an article about Kinect cameras. Before you read, discuss the following questions:*

- Have you ever used a Kinect camera? Describe you experience.

2. *Read the following articles and explain how Kinect cameras are used in both cases. As you read, complete the gaps (1-11) in each text with one suitable word.*

TEXT A

Kinect cameras look for kicks and punches

THINK before you swing a punch. That CCTV camera might know what you are doing thanks to a monitoring (1) _____that can detect aggressive behaviour.

Based on Microsoft's gaming (2) _____Kinect, Kintense analyses a person's body and picks out where the joints are to create a real-time 3D skeleton figure. An algorithm then (3)_____movements made by this model that indicate aggressive acts such as kicking, pushing, hitting and throwing.

Unlike Kinect, Kintense doesn't (4) _____people to be facing the camera. In trials, some actions like kicking were recognised with 90 per cent (5) _____, but other movements, like punching and throwing, were trickier to (6) _____. The system, designed by Shahriar Nirjon and colleagues at the University of Virginia, was created to (7) _____medical staff if a patient is acting violently – but it could also be used in (8) _____cameras. It was presented at the SenSys conference in Rome, Italy, this week.

"Using (9) _____and acoustic sensors originally developed for games is now a very powerful paradigm for many different kinds of (10) _____, including health," says team member Jack Stankovic. They plan to upgrade the system so it can recognise verbal (11) _____, too.

TEXT B

Kinect system keeps track of household objects

FITTING your house with a network of Kinect (1) _____could mean never losing your wallet, TV remote or other small items again.

"We want to make Google for your home," says Shahriar Nirjon, a computer (2) _____at the University of Virginia in Charlottesville. To do this, Nirjon and colleague John Stankovic developed Kinsight, which (3) _____the location of household items using a Kinect depth camera in each room. It works by (4) _____people and detecting the size and shape of any objects they interact (5) _____. Each object is compared to Kinsight's database for the house and either recognised or (6) _____to the list.

By following the location of objects over time, Kinsight can even (7) _____between two identical-looking things - if it records a mug that seems to have jumped from the living room to the kitchen without passing through the space between, for example, it knows it is (8) _____to be two mugs. The system can locate fist-sized objects with an (9) _____of 13 centimetres.

Objects need to be manually (10) _____to be searchable in the system, but Nirjon plans to develop a smartphone (11) _____to make this easier. He presented the work at the Distributed Computing in Sensor Systems conference in Hangzhou, China, last month.

From *New Scientist*

3. *Answer the following questions:*

- How can Kinect cameras help to counteract violence in cities? (*Text A*)

- How can Kinect cameras be helpful at home? (*Text B*)

4. *Discussion/Writing:*

- Can you imagine any other possible way to use Kinect cameras (for the benefit of the society or in the household, etc.)?

4. OUPUT DEVICES

PART A *3D-PRINTED FIREARMS*

1. *You are going to read an article about 3D printing. Before you read, discuss the following questions:*

- What is 3D printing? What can it be used for?

2. *Read the following article and explain how 3D printing is involved in the gun crisis.*

The real US gun crisis is being overlooked.

LAW-MAKERS in the US are fighting to keep blueprints for 3D-printed guns off the internet – but how worried should we be about untraceable plastic firearms?

In 2013, law student Cody Wilson unveiled the Liberator, a plastic handgun produced on a 3D printer that could fire conventional ammunition. He posted the files online so that anybody could download them and, in theory, print their own pistol.

He later added a second design that helps people to mill a rifle part called a lower receiver from a block of aluminium. These parts are controlled under US gun regulations and carry identifying serial numbers.

By releasing plans for untraceable weapons that could be produced at home, Wilson was making effective gun regulation impossible. The US Department of State told Wilson to remove the files from the internet. They had already been downloaded more than 100,000 times.

Wilson sued the Department of State in response. It relented last month, following a lengthy legal battle, and quietly gave permission for the files to go online again from 1 August. Eight US states in turn sued the Department of State and got a temporary restraining order issued to block the release of the files. A hearing next week will decide what happens next.

Amid all this legal wrangling, a key question has gone unanswered: are these weapons actually a threat? The prospect of roving gangs armed with 3D-printed guns is slim. The Liberator is a clunky and ineffective weapon that can only be fired a few times before the plastic barrel splits. Equally, building your own gun is not illegal in the US, and anyone with the required skills is free to create their own lower receiver on a milling machine.

Although untraceable firearms sound particularly scary, the US is already full of them. And regulations designed to enforce US gun rights prevent the government from creating a searchable, computerised database of gun store sales. Instead, the records are kept on paper and microfilm, which must be painstakingly searched by hand. In many states, private sales are unmonitored.

Behind the hysterics over new technology, the crux of the debate lies in whether the government should control access to firearms. As a risk to citizens, the Liberator is underwhelming; it poses a much greater threat to the authority of the US government.

An age of easily shareable digital files and reliable fabrication offers resistance to what Wilson called “the collectivisation of manufacture”, putting it outside the control of authorities.

Ultimately, the fate of 3D-printed firearms is a distraction from the US’s much larger gun problem: the public health crisis of the tens of thousands of people who die each year as a result of gun violence.

Since 2013, when Wilson first released his plans for the Liberator, no one has been killed by a 3D-printedgun. According to the Gun Violence Archive, an organisation that launched in the same

year to collate statistics on gun violence, 65,310 people in the US have been killed by guns since 2014. What's more, that doesn't include the roughly 22,000 gun suicides that take place in the US each year. The US has a gun problem – 3D printing is a distraction.

From *New Scientist*

3. *Answer the following questions:*

- What did Wilson do?

- What is the reaction of the US government? And why?

- Are 3D-printed weapons a threat?

4. *Explain the meaning of the highlighted words and expressions.*

5. *Discussion/Writing:*

- What things can be produced on a 3D printer? Do you think there should be any legal regulation of 3D printing? Why/why not?

PART B *A SCANNER CHEAPLY*

1. *You are going to read an article about an all-in-one printer. Before you read, discuss the following questions:*

- What is an all-in-one printer? What are their functions?

2. *Read the following article and find out the author's advice about getting a printer. As you read, complete the gaps (1-13) with one suitable word.*

The home-working revolution

Do you need a printer, scanner, or copier? These days, those three are almost always contiguous: Modern printers contain the necessary technology to digitally scan and copy whatever documents you might choose.

Think carefully about (1) _____ or not you need one, though.

Many employers have moved steadily towards digitization (2) _____ the past two decades, and old-fashioned paper files are on the way out. Let the door hit them as they go, we say.

Our advice would be to not get a printer unless you absolutely need (3) _____. Even modern units are bulky, heavy, and usually quite loud— and don't even get us started (4) _____the cost of printer ink. However, there are situations that necessitate a printer, (5) _____ as printing labels for packages or leaflets for distribution. If you can't access your usual printer in the office (or a local library), then buying a printer-scanner-copier (6) _____ be the right call.

It's important to (7) _____ the product to the purpose, of course; if you just need to print off the odd letter, make sure you buy a compact printer that you can easily store out of the (8)_____ when not in use, like the LaserJet Pro M15w or Envy 5055, both from HP. The M15w is very

reasonably priced, although it's (9) _____ noting that it doesn't offer automatic duplex printing. However, if you expect to be churning out documents just like you would at the office, investing in a heavier- duty model might be a better (10) _____, and the Epson EcoTank ET-3760 isn't pretty, but it's very ink-efficient and not too noisy. Alternatively, if you've really got money to (11)_____ (or a work- issued ink budget), the Ecosys P5026cdw printer from Kyocera powers through large duplex print loads without making much of a racket — just (12)_____ yourself a favour and be sure to keep abreast of how fast you're burning through those (13) _____ cartridges, OK?

From *Maximum PC*

3. *Answer the following questions:*

- What do you need to take into consideration before buying a printer?

- What aspects/features of different printers do you need to compare to choose the right one?

- What models are recommended by the author? And why?

4. *Discussion/Writing:*

- Do you have a printer/scanner/all-in-one? Would you like to have one?

PART C *VR WITHOUT HELMETS*

1. *You are going to read an article about a way of creating virtual reality. Before you read, discuss the following questions:*

- What is virtual reality? How is this interaction between a person and an artificial three-dimensional environment created?

2. *Read the following article and explain how virtual reality is created this experiment. As you read, complete the gaps (1-13) with one suitable word.*

Will superblack paint create virtual reality 2.0?

STANDING in front of a surface coated in Vantablack is terrifying. The nanotech material is (1)_____ blackest black there is, reflecting so little light back that a room painted floor (2) _____ ceiling with the stuff makes the world disappear. I feel I'm in a sensory deprivation tank as my eyes and ears strain to (3) _____ a grip on something, anything

Suddenly, a screen explodes with colour, and the roar of Activision's latest *Call of Duty* game, *Black Ops 4*, shatters the void. "This is VR 2.0," (4) _____ Ben Jensen, chief technology officer at UK-based Surrey NanoSystems, the company behind Vantablack.

To date, Vantablack's main industrial use is in precision cameras for satellites or autonomous vehicles, where it prevents interference from stray light. Anish Kapoor, (5) _____ is the only artist licensed to work with Vantablack, and marketing agencies are also busy dreaming up other (6)_____.

This is the first time the largescale version of the paint, VBx2, has (7) _____ used to paint the inside of a structure. I am with other gamers in a warehouse set up by Activision to try (8) _____

Black Ops 4, the biggest, most bombastic of the series. To play well takes skill and reflexes that are easier to develop in an environment that shuts out (9) _____ but the game. Could Vantablack offer a no-helmet immersion for virtual worlds? Jensen has played VR games for (10) _____ but cuts them short because he finds helmets exhausting. "But in the Vantablack room I feel like I could play all day."

Don't plan on redecorating your living room though - applying the material (11) _____ easy, says Jensen. The blackest version of Vantablack reflects just 0.0365 per cent of light. Photons hitting the material get trapped in a carbon nanotube structure, bouncing around until they are absorbed. Jensen's team has developed sprayable (12) _____ of Vantablack, but they still need to be applied in a way that lets the nanostructure build up. "It takes significant training," he says. "We use robots."

Still, everyone leaving that blacker-than-black room had big grins on their (13) _____.

From *New Scientist*

3. *Answer the following questions:*

- What is VR 2.0? How is it created?

- Was the experiment a success? What was the gamer's reaction?

4. *Discussion/Writing:*

- Have you tried virtual reality? Describe about your experience.

PART D *SCREEN TIME*

1. *You are going to read an article about screens and children. Before you read, discuss the following questions:*

- What are the major types of screens/monitors? What are their strengths and drawbacks?

2. *Read the following article and answer the question in the heading. As you read, decide which of the fragments given below (A-H) fit into the gaps in the text (1-7). There is one fragment that do not need to use.*

Can too much screen time harm children?

IT SEEMS intuitive that children's schoolwork will dip if they spend too much time gazing at their phones (1) _____. And that is broadly what a study published this week has found. But is it the final word, and should parents be panicked into pulling the plug on their kids' devices?

Researchers in Canada analysed lifestyle data from questionnaires taken by 4520 US children aged 8 to 11. The children also performed a variety of standard cognition tests.

Jeremy Walsh at the Children's Hospital of Eastern Ontario Research Institute in Ottawa, Canada, and his colleagues evaluated (2) _____. These suggest limiting screen time to 2 hours a day, sleeping for 9 to 11 hours a night and spending at least an hour being physically active.

More than a third – 1655 children – met the guideline for limiting screen time, and their average performance in the cognitive tests was 4.5 per cent higher than that of the 1330 children

(3)_____. The gain was even higher, at 5.2 per cent, for those meeting both the screentime and sleep recommendations

So, armed with these results, should parents be clamping down on screen use? Walsh himself says the findings are provisional. “All these results need to be tempered by the fact it was only a snapshot of children at one point in time,” he says. The US study is running for a further 10 years and will enable Walsh and others to track (4) _____.

“We can’t be definitive about directionality, that the extra screen time is depleting cognitive performance,” says Eduardo Esteban Bustamante at the University of Illinois in Chicago. “It’s a 10-year longitudinal study, and so something to keep an eye on.”

Another limitation is that the survey didn’t reveal what the children were doing on their screens, which could be educational or trivial. “The study is limited by treating all screen time as equal,” says Heather Kirkorian at the University of Wisconsin- Madison. “To truly understand the impact of digital media on children, researchers must understand not only how much, (5) _____.”

It is also unclear whether the questionnaires can produce accurate data. “The 8 to 11-year-old children reported their own screen and physical activity behaviour, and (6) _____,” says Kirsten Corder at the University of Cambridge. “Data like these are likely to have different types of error which can make it harder to be certain about the results.”

However reliable the results – which will become stronger with each year’s new data – researchers agreed that parents should try to set some limits on screen time, (7) _____. “Screen time before bed is doubly problematic because it keeps kids up later, and exposure to light impairs sleep quality,” says Bustamante.

Walsh has similar feelings: “We show that excessive screen time before bed has a negative impact on sleep, which is important for development of cognition and the brain generally,” he says.

From *New Scientist*

A who met none of the guidelines	**E** instead of getting to bed or getting some exercise
B especially when bedtime approaches	**F** but also how, what, where and with whom they’re watching
C whether the children change their behaviour over time	**G** how well the children met various Canadian government guidelines
D what is especially awful	**H** many may have struggled to do this accurately

3. *Answer the following questions:*

- What are the Canadian government guidelines about screen time? To what extent are they met by children?

- Why do researchers call their findings provisional?

- What is the researchers’ recommendation for parents?

4. *Discussion/Writing:*

- How much time do you spend in front of your monitor? Do you think it is in any way harmful to your health?

PART E *TAPPING THE CLOUD FOR TRANSCRIPTION AND MORE*

1. *You are going to read an article about a certain type of headphones. Before you read, discuss the following questions:*

- What kind of headphones do you have? What are its features?

2. *Read the following article and explain the main features of the Surface Earbuds. As you read, decide which of the passages (1-8) given below fit into the gaps in the text (A-G). There is one passage that do not need to use.*

Microsoft's Surface Headphones probably hitched themselves too closely to Cortana, turning what was an intriguing product into a tchotchke that was handed out at a Surface fan event before Microsoft's Surface launch started. With Microsoft's Surface Earbuds, Microsoft seems determined not to make the same mistake.

A _____ When Cortana was de-emphasized, down went the Headphones. With the Earbuds, Cortana appears just once on the Earbuds' one-page product sheet. Instead, the secret sauce is its cloud transcription capabilities, plus what Microsoft is touting as a superior audio solution for apps like Spotify.

At $249, the Surface Earbuds are $50 more than the Apple AirPods—which will inevitably be seen as a competitor even if Microsoft's earbuds do much more. Microsoft may also have a shot at putting a Cortana-powered earbud on the market before Amazon launches the Amazon Echo Buds at the end of the month for $129.99.

Here are the Surface Earbuds in short: They're 7.2 grams apiece, measuring just under an inch by 0.75 inches. Inside is a 13.6mm driver, good for 20Hz to 20kHz of frequency response. The Earbuds can process both aptX and the SBC audio codecs. They'll work with Android 4.4 and above, Windows 10, iOS9, and Bluetooth 4.1/4.2. They're "waterproof," with an IPX4 rating that means that they can withstand water being sprayed on them for five minutes. **B**_____

A comfortable fit

Viewed on someone else, the Surface Earbuds remind me of ear gauges, the polarizing ear jewelry that can be attractive to some and disturbing to others. Microsoft's Surface Earbuds don't fit tightly in the ear—and that's a good thing, in my opinion—instead resting lightly in the ear canal so that you can hear other ambient noise around you. The white discs are in fact control surfaces, which you swipe and tap to execute actions through your Earbuds.

I detest in-ear earbuds, because my ear canals either fail to hold the earbuds securely, or they get jammed in so uncomfortably that I quickly remove them. **C**_____

Microsoft provided guided demos of the Earbuds. When it came to be my turn, I tried on the earbuds, which I was told were controlled by the outer surfaces. A double tap paused and restarted the music being played by the Spotify app, while the volume was controlled by a swipe up and down. **D**_____

Microsoft describes the Earbuds' sound quality as the product of a "Surface Omnisonic sound profile with custom-designed drivers and precision tuning inspired by listening to the world's best live music venues and most advanced audio equipment, delivering an audio experience that's rich, immersive and crystal clear." **E**_____

Microsoft's Surface Earbuds also include the capability to integrate with Office 365 and Cortana, using a prolonged touch and hold. Each earbud has two microphones, and they clearly understood what I was trying to say when I asked Cortana a couple of sample queries.

Transcription is where the Earbuds shine. Dictation is built into Word — but it's lousy and works off of local voice models that you have to train. We're learning that a cloud model — a massive corpus of information hosted by Google or Microsoft or Amazon — works much more

efficiently. **F**_____ I was told that the Earbuds can also translate your speech into several languages.

Cool? Yes. But at $249, I'd have to seriously consider whether I needed a personal assistant living in my ear. I really liked the Surface Headphones, and the Surface Earbuds certainly offer the potential to enhance productivity through oral dictation. Will they complement your phone, PC, and smart speaker, though? **G**_____

From *PC World*

1 *Microsoft provides three sets of silicon tips to fit your ears. The medium-sized tips fit me snugly and comfortably after a bit of adjustment.*
2 *When I tried a few sentences, the Earbuds correctly transcribed what I was saying in a crowded room, even with a hoarse voice and against a noisy background.*
3 *Microsoft says the Surface Earbuds come in just a single colour, Glacier White, but there were grey earbuds on display, too*
4 *That's not a slight against Microsoft. The Headphones offered powerful, selective noise-cancelling technologies, but Microsoft positioned them as a Cortana accessory.*
5 *In the crowded venue the audio sounded rich and strong, but not necessarily "immersive and crystal clear." I'd probably need exposure in a mellower venue to appreciate them fully.*
6 *Those are the questions that a review will have to answer.*
7 *The Earbuds are good for 24 hours of charging via the charging case: 8 hours per charge, with two "refills" from the case.*
8 *Taps weren't always recognized, but the swipes worked fine, prudently sliding the volume levels up and down a few notches at a time.*

3. *Answer the following questions:*

- What are the strengths and weaknesses of the Surface Earbuds?
- What is the price of the Surface Earbuds? Do you think that such a price is reasonable?

4. *Match the highlighted words and expressions with the meanings below:*

- fasten something to something else
- comfortably
- a place with smooth sounds
- make a good combination with someone or something else
- peaceful noise
- offence
- make an attempt
- lose or be defeated

5. *Discussion/Writing:*

- Would you buy the Surface Earbuds? Why/why not?

PART F ***HEADSET REVIEW: OPTIMIZED FOR OPEN WORKSPACES***

1. *You are going to read an article about a headset optimized for open workplaces. Before you read, discuss the following questions:*

- What features are important for headphones that are used at work? Are they different from those that are essential for the headphones that are used at home?

2. *Read the following article and list nine features that make this headset ideal for open offices. As you read, complete the gaps (1-18) with the words or expressions given in the box.*

active noise cancellation	controls	equalizer	hours-long stretches	power button	voice prompt
additional expense	drop outs	headband	on-ear phones	self-muting microphone	wireless charger
basic functions	earcups	headset	playback	sound quality	wireless products

Logitech's Zone Wireless headset is designed to address a specific situation: open offices. This design trend might be great for collaboration, but it can be a hindrance when you're just trying to work. Noise and lack of privacy can kill productivity and raise stress levels, ultimately leading to lower job satisfaction.

Many workers already combat the distraction by donning a pair of ear buds or headphones. But this workaround creates its own hassles, requiring separate headsets for music and phone calls. The Zone Wireless headset uses **1**_____ to block out distractions, and a **2**_____ that makes it easy to switch between listening to tunes and talking on the phone.

Design

The Logitech Zone Wireless headset has a flexible padded **3**_____ and comfortable leatherette **4**_____**.**

The headset weighs 6.4 ounces and has a silicone-padded metal headband that provides a snug fit without feeling constrictive. Soft leatherette padding keeps the **5**_____ comfortable and is breathable enough to be worn comfortably for hours. The microphone, which can be worn on the left or right, automatically mutes when you swivel it up and unmutes when you bring it down.

The headset's power and ANC (Active Noise Cancellation) buttons are on the same ear cup as the microphone; they'll be positioned on the back or front of the cup depending on whether you're wearing it on the left or right ear. Play/pause and volume **6**_____ are on the outside to the microphone cup, and there's a mute button on the arm of the mic itself. All of these are easy to control with a thumb or forefinger while you're wearing the headset.

You can charge The Zone Wireless using the supplied USB cable, or with a third-party Qi **7**_____. The headset also comes with a travel pouch, and a USB-A dongle that enables you to connect the headset plus up to six other Logitech Unifying **8**_____ to your computer simultaneously.

Setup

You can play music on the Logitech Zone Wireless, with pretty good **9**_____.

To connect the headset to your phone, you press the **10**_____ for one second to activate Bluetooth pairing, and then select the Zone Wireless from the phone's list of recognized devices. The headset's **11**_____ tells you when the pairing is successful.

Next, you'll want to download the Logi Tune app. This gives you additional control over **12**_____like the mic mute and ANC. It also provides an **13**_____to optimize the audio, and a Sidetone volume control that lets you hear how loud you sound so you can set an appropriate volume level before a call.

Performance

I used the Zone Wireless in my home office, and though I don't normally wear a headset I quickly found this one essential.

The ear cups were comfortable to wear for **14**_____**.** With ANC activated, the Zone Wireless filtered out most of the audio distractions I contend with daily, everything from the ambient hum of family activity to the traffic sounds from the freeway outside my office window. Even the clickety-clack of my typing was significantly reduced. Still, I never felt disconnected from my environment. If someone came up to talk to me, I could hear them clearly without removing the **15**_____**.**

During phone calls, the audio was clear without any echo or **16**_____. I found the Sidetone control particularly useful, as it eased worries that I might be "shouting" in that conference call. Though these aren't headphones for dedicated music listening, **17**_____ quality was better than average, with clearly defined highs and lows.

The Zone Wireless does not come with a wireless charger, but Logitech provided one for this review. For wireless charging, you fold the ear cups together and place them on the charger. Though it's an **18**_____**,** I found the convenience well worth it.

Verdict

I'd recommend the Zone Wireless headset to anyone working in an open office or other busy workspace. It makes toggling between your playlist and your phone effortless and provides the necessary peace and quiet when you have to get down to business.

From *PC World*

3. *Explain the meaning of the highlighted words and expressions.*

4. *Discussion/Writing:*

- Describe your ideal headphones.

5. STOGARE DEVICES

PART A *PLAY THAT TAPE AGAIN*

1. *You are going to read an article about the cassette tape. Before you read, discuss the following questions:*

- What is the cassette tape? When was it used? What for?

2. *Read the following article and explain how old cassette tapes can be used nowadays. As you read, decide which of the fragments (A-F) given below fit into the gaps in the text (1-5). There is one fragment that do not need to use.*

Forget hard drives – ultra-dense tapes are the future of big data storage.

The cassette tape is about to make a comeback, in a big way. From the updates posted by Facebook's 1 billion users to the medical images shared by healthcare organisations worldwide and the rise of high-definition video streaming, the need for something to store huge tranches of data is greater than ever. And while hard drives have traditionally been (1) _____, a new wave of ultra-dense tape drives that pack in information at much higher densities, while using less energy, is set to replace them.

Researchers at Fuji Film in Japan and IBM in Zurich, Switzerland, have already built prototypes that can store 35 terabytes of data - or about 35 million books' worth of information - on a cartridge that measures just 10 centimetres by 10 cm by 2 cm. This is achieved using magnetic tape coated in particles of barium ferrite.

But the real debut for this technology is likely to be the Square Kilometre Array (SKA), (2)_____, whose thousands of antennas will be strewn across the southern hemisphere (New Scientist, 2 June, p 4). Once it's up and running in 2024, the SKA is expected to pump out 1 petabyte (1 million gigabytes) of compressed data per day.

To get an idea of just how much data that is, if the SKA data archive was built using today's high-capacity 3-terabyte hard disc drives, the telescope would fill 330 drives a day, or an unmanageable 120,000 drives a year.

That annual archive growth would swamp an experiment that is expected to last decades, says Evangelos Eleftheriou of IBM, who is part of a team working to build tapes for the SKA. By the time the telescope comes online, he and colleagues expect to be able to store 100 terabytes on (3)_____, by shrinking the width of the recording tracks and using more accurate systems for positioning the read-write heads used to access them.

Using tapes should cut down drastically on energy use, too. Data centres based on disc drive arrays use over 200 times more power than would (4) _____, according to a 2010 study by The Clipper Group, a technology consultancy based in Rye, New Hampshire. That's because disc drives in large arrays tend to remain powered-up, so their platters spin continuously, in case data is required, says Jon Hiles of Spectra Logic, a digital archiving firm in Boulder, Colorado. But tape drives only use power when they are being read or recorded on, he says.

The downside of tapes is that they are slower to access than hard discs because they have to be fetched by a robotic mechanism, inserted in a reader and spooled to the right point. But the Linear Tape File System, which is being developed, expedites this process to make it comparable to disc drives, Eleftheriou says.

As storage needs skyrocket, hard drives won't be able to keep up and keep power down, Eleftheriou says. (5) _____ are facing physical limits that mean they can only add more

power-munching platters. "It's time to take advantage of the low power and low cost of tape," he says.

From *New Scientist*

A a tape library of similar size
B the world's largest radio telescope
C the future of big data storage
D Density improvements in hard drives
E the workhorse of large storage operations
F a cartridge of a similar size to their prototype

3. *Answer the following questions:*

- What are the ultra-dense tapes?

- What can they be used for?

- What are the advantages of the ultra-dense tapes? Are there any downsides?

4. *Match the highlighted words and expressions with the meanings below:*

- eat something noisily

- scattered things around a large area

- covered with a thin layer

- a set of units, arranged in lines across or down

- produce

- extremely and suddenly

5. *Discussion/Writing:*

- What is ‘big storage’? What devices are used to store huge tranches of data?

PART B *DEFEND YOUR DATA WITH THE DISK G*

1. *You are going to read an article about a storage device. Before you read, discuss the following question:*

- What storage devices do you use? Explain your choice.

2. *Read the following article and explain the main features of the diskG. As you read, complete the gaps (1-12) with one suitable word.*

iStorage offers military-grade protection

ISTORAGE AIMS to bolster the protection of user data with its latest high-security (1) _____ device.

Promoted as the world's most secure, compact and affordable USB portable hard disk drive, the diskG (2) _____ PIN code access along with military-grade 128-bit and 256-bit AES hardware encryption to ensure data remains (3) _____.

Any data that is stored on the drive is instantly encrypted in real time, which makes the device as fast as most (4) _____ USB devices. The diskG is the only hard drive to have been awarded the CESG CCTM government accreditation, (5) _____ the chipset within the device is NIST accredited, meaning users can be certain of the drive's security and performance.

The device incorporates a self-destruct (6) _____, which initiates a three-pronged approach against a brute force attack.

Initially, (7) _____ to the drive is prohibited until the correct PIN code is entered and blocks automated attempts. After a predetermined number of failed PIN entry (8) _____, the device will destroy its encryption key and remain locked, (9) _____ stored data useless and requiring a complete reset in order to function again.

With a wear-resistant keypad and rugged build, the device is (10) _____ to be mobile and taken on the road, complete with its low- power (11) _____ and slim pocket design. Shock-mounting systems and rubberised paint ensure the device remains protected from drops and knocks, whilst the built-in USB 2.0 cable ensures it (12) _____ simple and easy to use.

From *PCR*

3. *Answer the following questions:*

- In what way the diskG is different from other storage devices?

- How does the diskG protect the date stored on it?

4. *Discussion/Writing:*

- Do you protect your files? How do you do it?

<u>PART C</u> *ONE BOOT DISK RO RULE THEM ALL*

1. *You are going to read an article about boot disks. Before you read, discuss the following question:*

- What is a boot disk? What are their main types?

2. *Read the following article and explain the problem with boot disks discussed in it. As you read, decide which of the fragments (A-G) given below fit into the gaps in the text (1-6). There is one fragment that do not need to use.*

How many boot disks do you have Lying around your desk? Maybe you have a whole drawer stuffed with burned optical discs or USB flash drives, struggling to remember what bootable

medium is on what, or you've tried to make do with two or three drives, swapping ISO images in and out.

Whatever your method, it's a pain keeping tabs on them all. Optical discs are - by their nature - slow to boot and obsolete the moment (1) _____ is released. As flash drive capacities grow ever larger, it seems wasteful storing a single 512MB bootable rescue disk on a 16GB drive. Wouldn't it be great if you could house all your boot disks on a single USB flash drive, then switch between them as required?

Your prayers have been answered. With Ventoy, a new open-source boot tool, you can store (2) _____ on a single flash drive, then choose which one to boot from a start-up menu. it's simple to get up and running: Head to www.ventoy.net and click "Downloads" where you'll find downloadable installers for Windows and Linux.

For Windows, download and extract the zip file's contents, and double-click "Ventoy2Disk.exe." You'll need (3) _____ - the larger the better. It should be detected automatically (click the "Device" drop-down menu if not). By default, support for secure boot is disabled; switch it on via "Option→Secure Boot Support" if necessary, then click Install to format the drive and set things up.

Then, drag bootable installers in ISO or WIM format onto your flash drive-over 260 are officially supported, but many more should work. Reboot your PC from the USB flash drive to view a list of the copied files. Select one, and it should boot as if you'd created a standalone boot disk for it.

If secure boot is enabled on your PC, you'll need to follow a one-time procedure outlined at www.ventoy.net/en/doe_secure.html- if successful, you're laughing, but I was unable to get the key enrolled on my MSI X470 Gaming Plus mobo when I enabled secure boot. Disabling secure boot meant the drive worked flawlessly.

The benefit of Ventoy is obvious - in my case, I can bring together my various install media (Windows 10, Ubuntu, elementaryOS, and so on) together with (4) _____, including Macrium Reflect and Lazesoft Recovery Suite, onto a single 16GB flash drive.

When your boot media is updated, download the latest version and either replace the older version with it or run multiple versions side by side for compatibility purposes across your machines. You're only limited by the size of your flash drive.

Ventoy itself is also undergoing rapid development - secure boot was only added in version 1.0.7, for example, while (5) _____ without having to partition the flash drive arrived in version 1.0.11. The Linux install process is convoluted at the time of writing, but a GUI is already being developed by a third party so don't be surprised to see a GUI option appear for setting up Ventoy on your Linux PCs too.

Adding these to your Ventoy flash drive is simple: Just download the latest version of the installer and use the "Update" button instead of "Install" to preserve current settings and ISO files.

As you delve deeper into Ventoy, the less user-friendly it becomes - persistence is one of several features configured using plugins (unattended installation scripts for Windows and Linux is another). These are basically JSON configuration files stored in a Ventoy subdirectory on your main partition. Thankfully, (6) _____ is available to explain how this all works - see https://ventoy.net/en/ plugin_entry.html for details.

From *Maximum PC*

A a single blank USB flash drive	**E** comprehensive documentation
B support for persistence across multiple live OSes	**F** a newer version of the bootable media in question

C open-source boot tool	**G** a selection of rescue discs
D multiple boot images	

3. *Answer the following questions:*

- What problem with boot disks does the author have?

- What is the suggested solution?

- What are the advantages and disadvantages of Ventoy?

4. *Explain the meaning of the highlighted words and expressions.*

5. *Discussion/Writing:*

- Do you use boot disks? How many do you have? How do you solve the problem of 'having too many boot disks'?

PART D *STORAGE SOLUTIONS SOLIDIFIED*

1. *You are going to read an article about trends in the field of non-volatile memory. Before you read, discuss the following questions:*

- What is non-volatile memory? What major technologies are used?

2. *Read the following article and explain what trends in the field of non-volatile memory are discussed in it.*

Intel and Samsung duke it out

This time last year, we predicted the future of non-volatile memory, and therefore SSDs, would be all about Intel's 3D Xpoint and Samsung's Z-NAND technologies. Fast-forward 12 months, and not much has changed, including the fact that we're still largely talking about the future. Neither 3D Xpoint nor Z-NANO have yet made much impact in consumer-level PCs.

That said, Intel's 3D Xpoint tech has become more widely available. Multiple generations and formats of drives based on 3D Xpoint and sold under the Optane brand have been released. We've had first-gen PCIe boards and M.2 cache cards replaced by second-gen products, while larger M.2 SSDs with just about enough capacity to run as primary drives have also been released. You could even argue that the mighty Intel 905p PCIe board is a third-gen product.

While Intel has made much progress, including refining its Optane controllers and algorithms, and bringing prices down, a limitation remains: Intel is still using first-gen 3D Xpoint memory chips. What's more, the Intel and Micron venture that created 3D Xpoint is on borrowed time. The two will part ways toward the end of next year.

The companies say they will keep working together to release second- gen 3D Xpoint memory chips in the first half of 2019, following which their venture will be done. For now, almost nothing is known about that second-gen 3D Xpoint tech. But more capacity at a lower cost would address the main remaining reservation we have with Optane drives: they are so expensive.

As for Samsung's Z-NAND, we've yet to see one in our Labs, and no consumer variants exist. Despite that, Samsung has announced a second generation of the tech. It includes new SLC Z-

NAND that doubles the data density of its first Z-NAND chips to 128Gb, and a new MLC variant with a nifty 256Gb per chip. However, the first products based on this will still be pricey, with Largo drives aimed at enterprise applications, as opposed to everyday consumers, a market shored up by its 3D NAND applications, and 970 Pro and Evo drives.

What's also unclear is the extent to which Samsung's Z-NAND is protected by patents. Toshiba's upcoming XL-Flash promises a very similar set of advantages as Z-NAND, including 10 times lower read latency than NAND. The overarching point involves competition. White Z-NAND and XL- Flash don't offer the same latency advantages as 3D Xpoint, they do promise to keep Intel on its toes.

How all that maps to SSDs isn't entirely clear. However, SSD prices are at all-time low going in to 2019, and with QLC or quad-level NAND flash ramping up, large drives are only going to get cheaper. Will we see the first sub-$100 1TB SSD from a big brand in 2019? Maybe. At the same time, second-gen 3D Xpoint memory chips, plus wider adoption of Samsung's Z-NAND and perhaps Toshiba's XL Flash, should enable a new generation of lower cost ultra-high performance SSDs. They still won't be cheap, but it's not hard to imagine a setup with something like a 250GB Optane OS drive and a 1TB SSD for mass storage being affordable by the end of the year. For most PC enthusiasts, however, 2019 will be about conventional NAND SSDs becoming cheaper than ever.

From *Maximum PC*

3. *Match the technologies with the following facts:*

Intel's 3D Xpoint technology	**1** The technology has no consumer variants yet.
	2 The technology is already available on the market.
	3 There is a second generation of products based on this technology.
	4 The second-gen products double the data density of the first-gen ones.
Samsung's Z-NAND technology	**5** The technology has a similar set of features as its competitor.
	6 The products based on this technology are sold under the Optane brand.
Toshiba's XL-Flash technology	7 The products based on this technology are expensive.
	8 The technology is aimed at enterprise applications.
	9 The technology offers 10 times lower read latency than NAND.
	10 The technology offers the best latency advantages.

4. *Match the highlighted words and expressions with the meanings below:*

- after the time that you were expected to stop doing something
- including or influencing every part of something
- good because it is clever, skilful, or effective
- compete or argue against each other:
- make sure that someone is ready for anything that might happen
- end a relationship with sb
- increase

- help or support something that is likely to fail or is not working well

- a new business activity that involves taking risks

5. *Discussion/Writing:*

- What features and what technologies of non-volatile memory will manufactures be focusing on next year?

PART E ***WD BLACK2***

1. *You are going to read an article about a drive combining SSD and HDD storage. Before you read, discuss the following questions:*

- What is SSD? What is HDD?

2. *Read the following article and explain the main features of the Black2. As you read, complete the gaps (1-12) with one suitable word.*

WD CLAIMS this is the world's first 'dual drive'.

The WD Black2 combines a solid state drive (SSD) with a hard disk drive (HDD), both of (1)_____ can be viewed and accessed as independent drives within the computer's operating (2) _____.

The drive is designed as an upgrade for notebook and small form factor desktop users. It aims to (3) _____ the performance of the system using the increased speed of a solid state device, while providing the (4) _____ capacity of a traditional hard disk drive.

Because both drives are contained in a standardized enclosure that connects (5) _____ a single cable, the drive can fit into a single 95mm slot.

Data is offloaded from the SSD to the HDD, a feature which is designed in (6) _____ to increase the endurance and life of the SSD.

The drive uses the SATA interface, (7) _____ can also be connected using a SATA connecter, making it (8) _____ with operating systems including Windows versions.

For users upgrading from a standard hard drive to the Black2, a cable is included which allows data to be (9) _____ from the older HDD to the new drive.

The WD Black2 is available now with an MSRP and includes a five- year limited (10) _____.

From *PC World*

3. *Answer the following questions:*

- What are the main features of the Black2?

- How does the Black2 work?

- What is it designed for?

4. *Discussion/Writing:*

- Explain the advantages and disadvantages of HDD and SSD storage? Which one do you prefer?

6. OPERATING SYSTEMS

PART A *WELCOME TO THE POST-WIMP ERA*

1. *You are going to read an article about a WIMP environment of operating systems. Before you read, discuss the following questions:*

- What is a WIMP environment? What are its components?

2. *Read the following article and explain the term 'Post-WIMP Era'. As you read, decide which of the fragments (A-J) given below fit into the gaps in the text (1-9). There is one fragment that do not need to use.*

It is hard to say exactly when the WIMP paradigm came into being. The mouse and pointer came out of the work of Douglas Engelbart and his research staff at the Stanford Research Institute during the mid to late 1960s. It was later, with Xerox Parc's Alto and Xerox Star, and with the Apple Lisa, that the WIMP approach solidified. Which device got there first is somewhat irrelevant; between them, these early devices established (1) _____of what we now know as desktop environments.

The 'WIMP' paradigm is made up of four key components: windows, icons, menus and a pointer. The approach was highly file-centric when it was conceived, and mimicked (2) _____. There were files and file systems, and a desktop containing a variety of objects, such as a wastebasket. Multiple files could be worked with simultaneously by having them on the screen at the same time, with windows forming the basis of early multitasking functionality.

For decades the WIMP paradigm dominated (3) _____. It is remarkable how long it was followed for. Though there have been some minor design innovations, the basic recipe (windows, desktops, file browsers, menu bars and pointer) has remained the same, despite major advances computer hardware and UI design approaches.

As computer software and hardware have developed, problems with the WIMP model were discovered. It did not make efficient use of screen real estate. Objects on the desktop got lost underneath windows. Large numbers of menus encouraged (4) _____ and made it difficult for people to find actions when they needed them. The file system proved to be a laborious and error-prone method of storing and retrieving data. Windows themselves produced additional management tasks for users, and pointer-based input was found to be inappropriate for mobile devices.

So, it is unsurprising that, dominant though it was, the era of the WIMP model is coming to an end. Some parts are inevitably being retained, but the basic formula of windows, icons, menus and pointers is being replaced. Maximized windows have become the norm, largely replacing (5)_____. Menus in the form of menu bars are increasingly uncommon. Pointers and pointing devices (such as mice and touchpads) are finding themselves coexisting with touch interfaces. File management is (quite rightly) being replaced. The desktop is becoming a thing of the past.

There are a number of reasons for the paradigm shift that we are witnessing in the field of GUI design. One of these has been the arrival of touchscreen mobile phones and later tablets. This new class of computing device required a different approach to GUI design and forced designers to create (6) _____. Free of its constraints, they found the freedom to develop new approaches.

Mobile, touch-based devices have been hugely successful, providing functionality that people value and experiences that they love. This has not merely been a consequence of their form factors

or use of touch input. The design of the software found on these devices has been (7) _____. Mobile, touch-based applications are typically better designed than so-called desktop software. They have better focus, are easier to use and deliver superior user experiences.

It is clear that the WIMP paradigm has started to give way to new and improved design approaches that have emerged in the mobile space, therefore. However, there is another process that is challenging the dominance of the WIMP paradigm: (8) _____ between touch and non-touch devices. Touch input is coming to a range of devices that have been the traditional habitat of WIMP environments: there are already many models of netbooks that have touchscreens, for example, and standalone monitors with touch input capabilities are increasingly common. At the same time, devices that function both as a tablet and a laptop have been available for some time, and tablet devices are themselves growing additional input capacities through keyboards, mice and touchpads, which sometimes feature as part of docking stations and cases. These new types of devices that are emerging require operating systems that can handle both pointing devices and touch screens. An OS that can be used with only touch or only a pointing device will not be appropriate for them.

The time of traditional desktop GUI design is over, and a new era is beginning. This offers the opportunity to make software that is better than what we had before. Touch input will play a major part in this new era, but it will exist alongside pointing devices and physical keyboards. All in all, we're already on the path to create (9) _____ that work with a variety of input devices.

From *https://afaikblog.wordpress.com/*

A the increasingly blurred distinction	F great new user experiences
B the simultaneous display of several windows	G the central features
C the design of graphical user interfaces	H alternatives to the WIMP model
D the success of mobile, touch devices	I GUI complexity
E a major contributing factor to their	J the physical world of the office

3. *Answer the following questions:*

- What inspired the 'WIMP' paradigm?

- What made the WIMP environment so successful?

- What are the reasons to believe that the WIMP environment is coming to an end?

4. *Discussion/Writing:*

- "The time of traditional desktop GUI design is over, and a new era is beginning." – Do you agree with the statement? Why/Why not?

PART B *WINDOWS LYFECYCLE*

1. *You are going to read an article about a lifecycle of an operating system. Before you read, discuss the following questions:*

- What is a lifecycle of an operating system? Do all operating systems have their lifecycles?

2. *Read the following article and name the four types of 'ends' regarding Windows lifecycle. As you read, complete the gaps (1-14) with one suitable word.*

When To Upgrade Your Operating System

With Windows 10's launch finally upon us, now is a great time to brush (1) _____ on the lifecycle particulars of Microsoft's current and former operating systems. Microsoft has a 10-year minimum support (2) _____ for its operating systems: at least five years of mainstream support and five years of (3) _____ support. Now is the time to upgrade, if the operating systems you use are nearing the end of their (4) _____.

The End Is Nigh

Microsoft's operating systems all have two different (5) _____ dates, End Of Sales and End Of Support. The former refers to the point at which Microsoft stops (6) _____ the particular version of Windows to OEMs (original equipment manufacturers) and retailers. Often, the retail End Of Sales dates occurs before the OEM one. According to Microsoft, you should begin thinking (7)_____ if your OS has reached its End Of Sales date, but as (8) _____ as your operating system has the latest service (9) _____, you'll still get updates and security fixes.

There are actually two End Of Support dates. The first occurs roughly five years after the operating system's (10) _____. This period is called the mainstream support phase, and during it you can still (11) _____ changes in product design and features, (12) _____ free security updates and hotfixes and get complimentary and paid support. When the mainstream support phase ends, the OS goes into its extended support phase, which eliminates complimentary support and most (13) _____; however, security updates and paid support will continue until this phase ends. If your OS is in the extended support phase, then you should (14) _____ upgrading as soon as possible.

From *Smart Computing*

3. *Answer the following questions:*

- What two expiry dates does Microsoft's operating system have?

- What is the end of sales? What are its two types?

- What is the end of support? What are its two types?

4. *Discussion/Writing:*

- When should one consider upgrading their operating system? How often do you upgrade the operating system that you use?

PART C *YOU CAN STILL UPGRADE FROM WINDOWS 7 TO WINDOWS 10 FOR FREE*

1. *You are going to read an article about upgrading an operating system. Before you read, discuss the following question:*

- Does one normally have to pay for upgrading his or her operating system?

2. *Read the following article and explain the steps to be taken in order to upgrade to Windows 10 for free. As you read, order the following parts of the article.*

Ditch that dead OS, officially unofficially.

[A] Yes, if you're running a valid, licensed Windows 7 Home, Pro, or Ultimate computer, you can still upgrade to Windows 10 for free, as confirmed by *How To Geek, ZDNet*, and *Bleeping Computer*.

[B] It was a great ride, but it's over. On January 14, 2020, Microsoft ended the life of one of its greatest operating systems ever. Windows 7 is dead. Your computer will still power on, but it won't receive any more security updates, and any bugs found won't get fixed. Bottom line: It's dangerous to keep using Windows 7, especially if you shop online or store any personal information on your PC. Of course, there are tips on how to stay as safe as possible on Windows 7 now that security updates are done, but your best bet is migrating to a more modern operating system. Good news! Remember Microsoft's offer of a free Windows 10 upgrade, the one that ostensibly ended years ago? It's quietly still available.

[C] It's unclear how long this will continue to be available, as the upgrade offer was officially yanked in 2016, so consider doing it sooner than later if you're interested. That said, since it still works, we're inclined to believe Microsoft doesn't mind this unofficial upgrade method and simply wants as many people off Windows 7 as possible. Now that Windows 7 is dead it's even more critical.

HOW TO UPGRADE FROM WINDOWS 7 TO WINDOWS 10 FOR FREE

[D] Sometimes, Microsoft will prevent the upgrade from occurring because of compatibility errors with your hardware or software. If so, you'll be dumped back into Windows 7 after a reboot. Troubleshooting those errors gets hairy and far beyond the scope of this article. Consider checking if there's a BIOS or firmware update available for your system if you run into an issue, though. Find one? Install it and run Microsoft's upgrade tool again.

[E] Click Install and wait for the tool to work its magic. After several reboots (and potentially a long wait), you'll be on Windows 10, which is still being supported for years to come. Yay!

[F] Next, head to Microsoft's Windows Media Creation Tool page and click the Upgrade Now button. The Media Creation Tool will download to your computer. Run it, select the Upgrade This PC Now option when prompted — not Create Installation Media — and choose to keep your apps and files.

[G] First, you'll want to have your Windows 7 product key in hand in case things go awry. If you're using a prebuilt PC bought at a store — the usual tower computers by Dell, HP, etc.— then it should have a sticker somewhere that includes the product key. If not, free tools like Belarc Advisor or NirSoft's ProduKey can scan your system and find it for you. Jot it down and keep it handy.

H If you're still out of luck, check out our guide to running Windows 7 safely, and consider migrating to Linux or buying a new Chromebook or Windows PC to hop back on the security update bandwagon. Seriously: You don't want to be running an unpatched, insecure operating system in today's world. Linux is much more user-friendly than it used to be and should handle most people's basic needs with minimal headaches.

I With that done, back up your data. Upgrading to a new operating system is a major task, and you don't want to lose your precious photos and files if things go wrong. We've got guides to the best Windows backup software and online backup options, but even stashing your most valued files on a USB key or external drive works. Whatever method you use, just make sure your data is backed up somewhere safe.

J If you want to take a more complicated route, you can also use the Create Installation Media option to clean-install Windows 10, inputting the Windows 7 product key you dredged up earlier when you were asked for your Windows 10 license. Most people should stick with using the much simpler Upgrade This PC Now option, though.

From *PC World*

3. *Answer the following questions:*

- What are the basic steps to take in order to upgrade to Windows 10?

- What is a more complicated way?

4. *Match the highlighted words and expressions with the meanings below:*

- to write a short piece of information quickly
- to store something secretly or safely somewhere
- to happen in the way that was not planned
- to manage to remember something
- supposedly

5. *Discussion/Writing:*

- Do you think that upgrading your operating system should be fee of charge or not?

PART D *HOW TO STAY AS SAFE AS POSSIBLE AFTER THE SECURITY UPDATES STOP*

1. *You are going to read an article about operating systems and safety. Before you read, discuss the following questions:*

- How are operating systems and the safety of your computer connected?

2. *Read the following article and explain the main features of the Surface Earbuds. As you read, match the headings (1-6) given below with the paragraphs (A-F).*

Windows 7 is one of the best things Microsoft ever released. The much-adored operating system wooed back users who reviled the disappointing Windows Vista, and it remained a comfortable refuge during the even bleaker Windows 8 era. Even today, with Windows 10 fixing Windows 8's worst mistakes and standing as a superb desktop operating system of its own, a legion of PC enthusiasts swears by Windows 7. Why? Because it stays out of your way, and it just works. But after January 14, 2020, the end of Windows 7's extended support, Windows 7 is dead. Your PC will keep operating, of course. Microsoft isn't literally pulling the plug on your devices. But Windows 7 won't receive any more updates or security patches, meaning your PC will also be very vulnerable to all those nasty malware programs garnering headlines seemingly every day. If you keep using Windows 7, you're on your own, and the Internet can get nasty. We can help you stay as safe as possible, though.

A / _____

Seriously: Switch away from Windows 7 by whatever means necessary. That's our underlying recommendation. Sticking with Windows 7 was understandable before; now it's a liability. With no security updates and a still-vast market share, Microsoft's operating system will be a big, juicy target for hackers. We recommend migrating to Windows 10 if you're able to. If you perform only basic tasks on your PC — email, web surfing, and documents — then Linux is a user-friendly option these days and you can try it for free with no risk to your main Windows 7 installation. But if you need to bide some time before making a switch, here's how to keep Windows 7 as safe as possible.

B / _____

A lot of malware gets delivered via browser vulnerabilities, and a lot of those will be aimed at Windows 7 now that it's wide open to attack. Microsoft's ending support for Internet Explorer too, and you definitely don't want to run an insecure browser on an insecure operating system. The other top browser vendors (Google's Chrome, Opera, Firefox) will continue to support Windows 7, however. Switch to one of those and make sure to enable automatic updates to keep those hatches battened down. This should be a top priority.

C / _____

That segues to a key point: make sure the software you're using still supports Windows 7, so that any potential security holes still get patched. After browser vulnerabilities, poisoned Office documents are another frequent attack vector. If you're still using Office 2007, stop—its support ended years ago. Office 2010 will continue to receive security updates until January, 2023 if you subscribe to Office 365. If that's not in your budget, think of free alternatives, such as LibreOffice and Google Docs. Besides, audit all your installed software, including browser plug-ins. If you don't use it, ditch it. Many standalone programs offer an option to update automatically to newer versions as they're pushed out. Activate it.

D / _____

The free antivirus that Microsoft offers for Windows users works great for most users, but it won't receive updates now that Windows 7 is end-of-life. Yes, Windows Security Essentials is dead too. Now that your operating system won't receive security patches it's even more crucial to run protection on your PC. While you can cobble together an arsenal of free security tools, we recommend buying a premium version if you're still running Windows 7. Modern security suites do much more than antivirus alone, protecting you against phishing, malicious ads, browser and email attacks, and more. If you're running an unsupported operating system, investing in a rounded-out security suite is money well spent.

E / _____

Hackers can't hack what they can't touch. Follow this pro tip from our old Windows XP safety primer: "If there's a single tip that could make any Windows PC more secure, it's this: Stay away from administrator accounts. If you're blasted by malware, it can only do as much damage as the account it infects. Admin accounts give baddies the keys to your computing kingdom." Once Windows 7 stops being patched, stick to using a Standard account for your day-to-day activities. Use an admin account to create the locked-down login and stock it with the software you need and then don't stray from Limited land unless you need to install or update software. You can go even further though. If your Windows 7 computer doesn't need to connect to the Internet, physically disconnect it from the Internet. Pull the ethernet plug right out or disable Wi-Fi. Alternatively, if you only need legacy Windows 7 support for a program or two, you can run Windows 7 in a virtual machine on a modern, supported operating system, be it Windows 10 or some flavor of Linux. If the virtual machine gets compromised, you can just wipe it and start over, with no harm to your main installation.

F / _____

Windows 7 was great while it lasted, but now it's gone. While these tips will help you keep using the operating system for longer, running an insecure OS in today's hyper-connected world is inviting trouble. Start thinking about your future options, whether it's snagging a free Linux distro, trying for a free Windows 10 upgrade, or straight-up buying a new Chromebook or Windows laptop. When the next catastrophic bug rears its head, you don't want to be left in the lurch.

From *PC World*

1 DON'T USE INTERNET EXPLORER
2 INSTALL ANTIVIRUS SOFTWARE
3 STICKING WITH WINDOWS 7 IS NOT AN OPTION
4 MAKE PLANS TO MOVE ON
5 BATTEN DOWN THE HATCHES
6 CHOOSE YOUR SOFTWARE WISELY

3. *Answer the following questions:*

- Why is it not recommended to stick with Windows 7 after the end of extended support?

- How can one keep Windows 7 as safe as possible?

4. *Match the highlighted words and expressions with the meanings below:*

- to move smoothly from one idea, activity, etc to another

- be left at a time when one needs help

- to take or collect something, especially information or support

- to quickly produce or make something that is useful but not perfect

- a book that contains basic information about something

- to prepare yourself for a period of difficulty or trouble

- without anything to make you feel happy or hopeful

- to express hatred

5. *Discussion/Writing:*

- How do you protect your computer form malware programs? Name three tips that you consider to be the most important.

PART E *WINDOWS 7'S SWANSONG IS OPPORTUNITY FOR PENGUINS*

1. *You are going to read an article about Linux. Before you read, discuss the following questions:*

- What is Linux? When and how was it created?

2. *Read the following article and explain the title of this article.*

Whether you are building a home server from an old PC or simply breathing new life into a well-loved laptop, there's a good chance that older hardware is still perfectly fine under Linux. Just because Windows 7 is in its final year doesn't mean your PC has to die with it.

As Windows progresses, older versions fall by the wayside. The latest victim of time's relentless march is Windows 7, which saw the end of extended support on January 14, 2020. This presents three sensible possibilities for a Win 7 machine: retirement and replacement, upgrade to Windows 10, or install and run Linux.

As long as I've been a Linux user, it's been hard to convince people to try - let alone switch to - Linux on a brand-new PC. To be fair, there's good reason not to: each new Windows version has flashy new features and interfaces. And, usually, everything works as intended out of the box.

Historically, it was rarely smooth sailing for a new Linux install, especially on newer hardware. Some things were quirky or didn't work at all, with wireless networking being the brunt of many a joke about desktop Linux. Nowadays, the vast majority of new hardware works under Linux without a hitch. Sure, you might need a proprietary driver or two - *cough* Nvidia *cough* - but you can be pretty certain that most chipsets and devices will work on Linux at some level of functionality.

Linux is really good at supporting older hardware. For the average user, this means that Linux will generally work really well on old PCs. If you've recently upgraded your main machine, and have old hardware lying around, you can keep the old rig out of landfill and get a few more useful years out of it as a backup rig, guest machine, server, or hand-me-down.

One of the primary reasons this is possible is due to how lightweight Linux desktops are. Some of the more feature-rich desktop environments, such as KDE or GNOME, aren't that resource-intensive at idle. However, if your system doesn't have much memory to work with, XFCE remains my go-to for a stable, lightweight desktop that has a reasonable level of visual polish. If you're running a system with less than 4GB of RAM, I'd stick to XFCE, and save the RAM for memory-hungry browsers.

If you do install a distribution that comes with KDE or GNOME by default, there's no reason why you can't install XFCE alongside it as the primary desktop environment, provided you have the storage to spare. If that SSD upgrade is on a smaller inexpensive drive, and you really need the extra gigabytes, you can always uninstall GNOME or KDE.

If you're updating your desktop or laptop with a new SSD (which is always a good upgrade for an old system that uses an HDD for system storage), don't fear: Linux has been playing nice with SSDs since kernel 3.8. (The current stable kernel is 4.20.) As long as you use a modern filesystem - such as ext4, which is the default be fine.

There's no promise that Linux will fit every user's needs, but the fact remains that most users now do a large portion of their work in web browsers. For this purpose, Linux works just fine. There's a few quirks and differences in UI, but by installing Chromium or Firefox in Ubuntu on an old laptop, there's no need to shell out the $100 for a Windows 10 license just to browse Facebook or use Google Drive.

Before retiring that laptop or desktop, take a day and see how Linux works in your use case. You could save yourself a hundred bucks, or at least learn (or teach someone) something new.

From *Maximum PC*

3. *Answer the following questions:*

- What are the possibilities for a Win 7 machine?

- Why has it been hard to convince people to try Linux?

- How do machines perform under Linux nowadays?

- Why is Linux particularly good at supporting old hardware? Do you agree with the author?

4. *Match the highlighted words with the meaning below:*

- without modification
- not being utilized actively
- not to throw away
- impressive
- to pay a lot of money
- the worst part of criticism
- to fail
- easy to achieve
- something strange that happens by chance
- somebody/something most trusted to accomplish a purpose
- without a problem
- used by someone and then given to another person

5. *Discussion/Writing:*

- Have you ever used Linux? Describe you experience.

PART F *ANDROID, THE WORLD'S MOST POPULAR MOBILE PLATFORM*

1. *You are going to read an article about Android. Before you read, discuss the following questions:*

- What operating system do you have on your smartphone/tablet PC? Are you satisfied with it?

2. *Read the following article and explain what makes Android so popular. As you read, decide which of the gfragments (A-J) given below fit into the gaps in the text (1-9). There is one fragment that do not need to use.*

Android powers hundreds of millions of mobile devices in more than 190 countries around the world. It's (1) _____ and growing fast - every day another million users power up their Android devices for the first time and start looking for apps, games, and other digital content.

Android gives you a world-class platform for creating apps and games for Android users everywhere, as well as an open marketplace for distributing to them instantly.

Global partnerships and large installed base

Building on the contributions of (2) _____ and more than 300 hardware, software, and carrier partners, Android has rapidly become the fastest-growing mobile OS.

Android's openness has made it (3) _____, driving strong growth in app consumption. Android users download more than 1.5 billion apps and games from Google Play each month.

With its partners, Android is continuously pushing (4) _____ forward to bring new capabilities to users and developers. For developers, Android innovation lets you build powerful, differentiated applications that use the latest mobile technologies.

Powerful development framework

Android gives you everything you need to build best-in-class app experiences. It gives you a single application model that lets you deploy your apps broadly to (5) _____ - from phones to tablets and beyond.

Android also gives you tools for creating apps that look great and take (6) _____. It automatically adapts your UI to look its best on each device, while giving you as much control as you want over your UI on different device types.

For example, you can create a single app binary that's optimized for both phone and tablet form factors. You declare your UI in lightweight sets of resources, one set for parts of the UI that are common to all form factors and (7) _____. At runtime, Android applies the correct resource sets based on its screen size, density, locale, and so on.

Open marketplace for distributing your apps

Google Play is the premier marketplace for selling and distributing Android apps. When you publish an app on Google Play, you reach the huge installed base of Android.

As an open marketplace, Google Play puts you in control of how you sell your products. You can publish whenever you want, as often as you want, and to the customers you want. You can distribute broadly to all markets and devices or focus on (8) _____.

You can monetize in the way that works best for your business - priced or free, with in-app products or subscriptions - or highest engagement and revenues. You also have (9) _____ and can set or change prices in any supported currency at any time.

Beyond growing your customer base, Google Play helps you build visibility and engagement across your apps and brand. As your apps rise in popularity, Google Play gives them higher placement in weekly "top" charts and rankings, and for the best apps promotional slots in curated collections.

Preinstalled on hundreds of millions of Android devices around the world, Google Play can be a growth engine for your business.

From *http://www.mit.edu/*

A *the boundaries of hardware and software*	**F** *the open-source Linux community*
B *other sets for optimisations specific to phones or tablets*	**G** *advantage of the hardware capabilities available on each device*
C *the largest installed base of any mobile platform*	**H** *complete control of the pricing for your apps and in-app products*
D *the framework on top of which you build your app*	**I** *hundreds of millions of users across a wide range of devices*
E *specific segments, devices, or ranges of hardware capabilities*	**J** *a favourite for consumers and developers alike*

3. *Answer the following questions:*

- What facts prove that Android is growing fast every day?
- Why is Android called ‘a world-class platform’?
- What capabilities does Android provide developers with?
- How does Android create the best-in-class app experiences?
- What makes Google Play a growth engine for business?

4. *Discussion/Writing:*

- What mobile OS do you prefer? Why?

7. SPREADSHEETS AND DATABASES/ WORD PROCESSING

PART A *SPREADSHEETS*

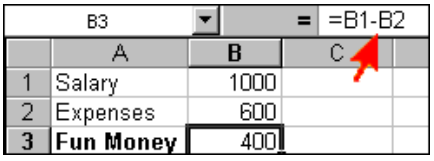
1. *You are going to read an article about spreadsheets. Before you read, discuss the following questions:*

- Have you ever used a spreadsheet program? What for?

2. *Read the following article and explain the main features of spreadsheets. As you read, complete the gaps (1-17) with one suitable word.*

Spreadsheet is a kind of [1] ____ that simulates a paper spreadsheet (worksheet), in which columns of numbers are summed for budgets and plans. It appears on screen as a matrix of rows and columns, the [2] ____ of which are called "cells." The cells are filled with (1) labels, (2) numeric values or (3) formulas.

Labels are descriptive text [3] ____ as "Rent" and "Gross Sales." [4] ____ are the actual numeric data, and formulas command the spreadsheet to do the [5] ____; for example, SUM CELLS A5 TO A10.



Labels, Values and Formulas
In this Microsoft Excel example, the labels are in cells A1, A2 and A3, and numeric [6] ____ are in B1 and B2. The [7] ____ in B3 is "subtract B2 from B1." In Excel, typing the equals sign starts the [8] ____ creation.

The Formulas
Formulas are the spreadsheet's magic, and they are easy to [9] ____. You click a cell and then [10] ____ the key (+, -, etc.) of the arithmetic operation that affects it. For example, the creation of a formula might be "the contents of this cell PLUS the contents of this cell DIVIDED [11] ____ the contents of this cell."

The Ripple Effect
After numbers are added or changed, the formulas [12] ____ the data automatically or with the press of a key. Since the contents of any cell can be calculated with or copied [13] ____ any other cell, a total of one column can be used as a detail item in another column. For example, the total from a column of expense items can be carried [14] ____ to a summary column showing all expenses. If the contents of a cell in the detail column changes, its column total changes, [15] ____ is then copied to the summary column, and the summary total changes.

What If?
The ripple effect lets you create a plan, plug in different assumptions and immediately see the impact on the bottom [17] ____. This "what if?" capability makes the spreadsheet [17] ____ for budgets, plans and other equation-based tasks

From *PC Mag*

3. *Answer the following questions:*

- What are spreadsheet's labels?

- What are spreadsheet's values?

- Why are formulas called the spreadsheet's magic?

- What is the ripple effect?

4. *Discussion/Writing:*

- What are the strong and weak sides of spreadsheets?

PART B *DATABASES*

1. *You are going to read an article about two different databases. Before you read, discuss the following questions:*

- What is a database? What are they used for?

2. *Read the following texts and explain the features and the purpose of these databases. As you read, decide which of the paragraphs (A-F) given below fit into the gaps in the texts (1-6).*

TEXT A

GLOBAL INTERNET FOR ROBOTS COMES ONLINE

European researchers have launched a global Internet for robots, an online database of information designed "to help them cope" with the confusing world of humans, according to BBC News.

[1] _____

The launch of this database represents the first phase of a project that aims to build a large-scale, cloud-based resource for robots of all kinds, which would serve as both an informational database and a calculating engine for jacked-in androids. Such a network of information would give massively more useful information to robots which currently rely on their own onboard memory banks and processing power to deal with real-world situations on an individual basis, project researchers said.

[2] _____

The use of this database could also make it far cheaper to produce more mobile robots, since they wouldn't require as much onboard storage and processing power, Dr. Heico Sandee, Robo Earth program manager at the Dutch University of Technology in Eindhoven, told BBC News.

[3] _____

The wirelessly accessible database currently serves as a fount of information for "software components, maps for navigation (e.g., object locations, world models), task knowledge (e.g., action recipes, manipulation strategies), and object recognition models (e.g., images, object models)," according to researchers.

Information in the database comes from both robots and humans and is presented in a machine-readable format in a "Cloud Robotics infrastructure which includes everything needed to close the loop from robot to the cloud and back to the robot."

TEXT B

INTERNET ARCHIVE LAUNCHES TV NEWS SEARCH DATABASE

In a bid to further its mission to make public information widely accessible, the Internet Archive has launched a new information database called TV News Search & Borrow.

[4] _____

In addition to that, the project will continue to add video news clips from years past. "The Internet Archive's TV news research service builds upon broadcasters' public interest obligations. This new service offers citizens exceptional opportunities to assess political campaigns and issues, and to hold powerful public institutions accountable," former FCC Chairman Newton Minow said in a statement.

[5] _____

In a departure from the Internet Archive's normally minimalist, no-frills approach to data presentation, the TV News Search & Borrow site is more in line with other contemporary websites, offering a slick visual interface that makes searching and browsing results easy and intuitive.

[6] _____

"This easily searchable and sortable database will be a fantastic resource for journalists, researchers, librarians and news junkies alike," said project supporter and former CBS News president Andrew Heyward.

From *PC Mag*

3. *Answer the following questions:*

- What is a global Internet for robots? How does it work?

- What is TV News Search & Borrow? Why was it created?

4. *Explain the meaning of the highlighted words and expressions.*

5. *Discussion/Writing:*

- Have you ever used a database? Have you ever created one? Describe your experience.

PART C *WHY WE RUN OFFICE, NOT 1-2-3 (AND HOW THAT MAY CHANGE)*

1. *You are going to read an article about word processing. Before you read, discuss the following questions:*

- What word processing software do you use? Explain your choice.

2. *Read the first part of the following article and explain what made Microsoft Office so popular. As you read, decide which of the fragments (A-I) given below fit into the gaps in the text (1-7). There are two fragments that do not need to use.*

PART I

This weekend marked the 30th anniversary of the release of Lotus 1-2-3, but the fact that, by and large, business users no longer care about 1-2-3, and just about all of us run Office got me thinking about why certain enterprise software becomes a standard and just what it takes to change standards.

Lotus 1-2-3 was not the first "killer application;" (1) _____. That honor goes to VisiCalc, which Dan Bricklin and Bob Frankston originally created for the Apple II. VisiCalc was a revelation—a completely different way of creating budgets and plans from what anyone had done before. VisiCalc was ported to other platforms and soon there were other spreadsheets, notably Sorcim's SuperCalc and Microsoft's Multiplan. (Keep in mind that this was in the era before software patents; I often wonder how the software world would have been different had VisiCalc been patented.)

These spreadsheets were moved to many different platforms, (2) _____. They ran better with faster processors and more memory but didn't really change. When the IBM PC came out in 1981, VisiCalc was available.

But the IBM PC had more memory and, in some ways, better graphics than the earlier generation of machines. This presented an opportunity to do more than the earlier spreadsheets did. In early 1983 Lotus 1-2-3 for the IBM PC's PC-DOS was released. In addition to performing the spreadsheet functions, 1-2-3 also had basic graphics functions and the ability to work with a table-based database (features of spreadsheets ever since). It was also easier to use, and its "slash commands" – "/" followed by a letter – became a standard. In addition, it allowed for macros that let spreadsheet users and third-party developers really extend the program. (3) _____, and it quickly became the must-have product for the IBM PC.

So why did Microsoft Excel, and later Microsoft Office, replace it? Some say it is because Microsoft created the Windows environment and Office's tie-in to Windows gave it as insurmountable lead. (4) _____, I'd argue that the experience of both companies in writing software for the Macintosh was just as important.

When the Macintosh came out in 1984, a lot of the focus in the industry was on "integrated software," with many vendors taking the lesson from 1-2-3's success that users wanted software programs that performed more of the typical business tasks. Therefore, on the Mac, Lotus took the integrated software concept and ran with it, creating a program called Jazz (and later a version called Modern Jazz) that included all the features of 1-2-3, plus word processing, like Symphony, in a graphical user interface. But it was too far ahead of its time; (5) _____. Microsoft, instead, initially came out with stand-alone programs, like Multiplan, Chart, and eventually Word. It was a couple of years later (in 1985) that the first version of Excel came out. In a twist of fate, that version of Excel was closer in features to 1-2-3 than anything Lotus had. Lotus Jazz was more ambitious, but Excel worked and quickly became the Mac standard.

It took Microsoft another couple of years to come out with a Windows version of Excel, and even that wasn't an immediate hit, as the PC-compatible market didn't move to Windows until the early 1990s. But while both Lotus and Microsoft did both Windows and OS/2 versions, Microsoft seemed much more committed to Windows, (6) _____.

Microsoft released Word for Windows in 1989, and the first version of Office for Windows (which combined Word, Excel, and PowerPoint) came out in the fall of 1990. It wasn't until a few years later, though, that the individual applications started to really share components and work together particularly well. (7) _____, and Office helped Windows. By the time Windows 95 and Office 95 came out, both were standards, and by that point, Lotus was more focused on its Notes mail and groupware product, and Lotus Development was sold to IBM in 1995.

Ever since then, just about every major business has been standardized on Microsoft Office.

A	the Mac just couldn't handle it
B	overall, the success of Windows helped Office
C	and it showed in the products
D	a host of others, each improving the user interface
E	in short, it was a lot more powerful
F	but while this connection was undoubtedly important
G	but it was fundamentally the same program on each
H	it was not even the first modern spreadsheet
I	of course, from the perspective of chip and PC makers

Read the second part of the following article and explain the current trends in word processing. As you read, complete the gaps (1-10) with one suitable word.

PART II

So why has there been so little competition? In part, because Office has become a standard with document (1) ____. While there have been lots of word processors that can (2) ____ Word files (most do fine with text, though there are differences in formatting), there really isn't a substitute for Excel, because so many people run (3) ____that just don't run in other spreadsheets.

What would it take to replace Excel, or Office in general? I don't think price matters all that much because for a typical business, the (4) ____of Microsoft Office, about $100 per employee per year, is far less than the cost of retraining. So, it's likely to take some new platform, or some new style of working that makes a (5) ____. For years, that hasn't happened, but now we're seeing some possibilities.

Web-based office (6) ____, notably Google Docs, seem to be gaining traction, especially in government and education markets, which are price-sensitive. What seems to really be (7) ____about the platform is how users can access documents from any machine and can more easily collaborate with others. Microsoft is offering similar features with Office 365, but it seems to be playing catch up.

Of course, Windows now (8) ____more competition than ever—especially with the iPad and Android tablets—and that may extend to Office as well. For the iPad, Apple has pushed its iWork suite, while QuickOffice and Dataviz's Docs to Go (9) ____multiple platforms.

Again, because of compatibility concerns, I'm not sure anything will replace Office (and especially Excel) in the enterprise any time soon. Still, these new platforms provide the biggest (10)____Office has seen in years.

From *PC Mag*

3. *Answer the following questions:*

- What was the first modern spreadsheet?

- What is Lotus 1-2-3?

- Why did Microsoft Office replace Lotus 1-2-3?

- Why has there been so little competition in word processing?

- Why is Microsoft Office facing the biggest threat nowadays?

4. *Discussion/Writing:*

- Do you believe that Microsoft Office will ever be replaced by other applications/platforms?

8. PROGRAMMING LANGUAGES

PART A *6 MOST DEMANDED PROGRAMMING LANGUAGES OF 2020*

1. *You are going to read an article about the most demanded programming languages of 2020. Before you read, discuss the following questions:*

- Name two programming languages that you consider to be the most demanded. Substantiate your opinion.

2. *Read the following article and complete the gaps with the names of programming languages listed below.*

JavaScript	***C++***	***PHP***	***Java***	***C#***	***Python***

Learning the right programming language at the right time is very important. If you are a student or an aspiring software developer who is planning to learn a new programming language, you should check the trend once. There are many job portals and trend analysis websites who releases the list of popular languages at a regular interval of time. These lists not only help students and professional to get an idea about the most in-demand languages out there but also shed some light on jobs availability. Today, I will share six most demanding programming languages based on the number of jobs available on Indeed in March 2020.

Most In-Demand Programming Languages of 2020

1. _____ – 76,253 jobs

[redacted] was developed by a Dutch programmer, Guido van Rossum. It can be considered as one of the fastest growing programming languages. [redacted] has seen a growth of around 24% in terms of job postings with 61,000 job postings as compared to last year's 46,000. It is a high-level object-oriented programming language that offers a wide range of third-party libraries and extensions to programmers. Developers also say [redacted] is simple and easy to learn. This language is also used to decrease the time and cost spent on application maintenance.

2. _____ – 72,328 jobs

[redacted] was developed by James Gosling at Sun Microsystems and later acquired by the Oracle Corporation. This is one of the most used languages in the world. Considering the number, the number of jobs postings have been grown by 6% as compared to the last year. [redacted] is based on the "write once, run everywhere (WORA)" concept. When you compile [redacted] code, it's converted into bytecode, and can run on any platform with any need of recompilation. That's why it's also called a platform-independent language.

3. _____ – 58,479 jobs

[redacted] is the third most popular programming language in our list. It's inspired by Java and developed by American technologist, Brendan Eich. This year [redacted] job postings haven't seen much changes, but still managed to secure the third position. Unlike other languages, [redacted] can't be used to develop apps or applets. It's fast and doesn't need to be compiled before use. [redacted] enables our code to interact with the browser and can even change or update both HTML and CSS.

4. _____ – 41,552 jobs

Though there are many programming languages available today, the power of [redacted] can't be ignored. Developed by Danish computer scientist Bjarne Stroustrup, [redacted] is widely used for game development, firmware development, system development, client-server applications, drivers, etc. [redacted] is actually an advanced version of C, with object-oriented programming capabilities. Its popularity grew by 16.22% as compared to the last year's job postings.

5. _____ – 33,461 jobs

[redacted] is popularly used for Windows program development under Microsoft's proprietary .NET framework. It's mainly used for implementing back-end services, and database applications. It's a hybrid of C++ and C languages. If you talk about the numbers, Java 's job postings didn't grow that much but it's still one of the most demanded languages.

6. _____ – 19,224 jobs

One of the most popular language used in web development, [redacted] may be losing its essence in recent years. It's an open source scripting language developed by a Danish-Canadian programmer.

Though the community is working hard to provide support, competing with python and other newcomers seems difficult. [redacted] is commonly used to retrieve data from the database and use on web pages. Its job postings are increased by 2,000 as compared to last year.

I hope you have got an idea and be able to decide which programming language you should learn in 2020. Whatever language you choose, first try to build the base the learning fundamentals, then start attempting small problems and ultimately move to medium and large projects.

From *www.technotification.com*

3. *Answer the following questions:*

- Why is Java called a platform-independent language?

- What are the advantages of Python?

- What are the limitations and advantages of JavaScript?

- In what areas is C++ used?

- What is the specialisation of C#?

- In what way is PHP different form other five languages?

4. *Discussion/Writing:*

- What factors helped the author to choose the most demanded programming languages? What factors influence the popularity of programming languages?

PART B *PROGRAMMING LANGUAGE*

1. *You are going to read an article about programming languages. Before you read, discuss the following question:*

- What is a programming language?

2. *Read the following article and explain the meaning of the different types of languages mentioned in the article. As you read, complete the gaps (1-21) with one suitable word.*

A programming language is language used to write (1) ____ for the computer. It lets the programmer express data processing in a (2) ____ manner without regard to machine-specific details.

From Source Code to Machine Language

The statements that are written by the programmer are called "(3) ____ language," and they are translated into the computer's "(4) ____ language" by programs called "assemblers," "compilers" and "interpreters." For example, when a programmer writes MULTIPLY HOURS TIMES RATE, the verb MULTIPLY must be turned into a (5) ____ that means multiply, and the nouns HOURS and RATE must be turned into memory (6) ____ where those items of data are actually located.

Grammar and Syntax

Like human languages, each programming language has its own grammar and syntax. There are many (7) ____ of the same language, and each dialect requires its own (8) ____ system. Standards have been set by ANSI for many programming languages, and ANSI-standard languages are dialect (9) ____. However, it can take years for new features to be included in ANSI standards, and new dialects inevitably spring (10) ____ as a result.

Low Level and High Level

Programming languages fall into two categories: low-level assembly languages and high-level languages. Assembly languages are available for each CPU family, and each assembly (11) ____ is translated into one machine instruction by the assembler program. With high-level languages, a programming (12) ____ may be translated into one or several machine instructions by the compiler.

Web Languages

Languages such as JavaScript, Jscript, Perl and CGI are used to (13) ____ Web pages as well as link them to other applications running in servers.

Even More Languages!

Programmers must use (14) ____ names for the instruction verbs (add, compare, etc.), and companies generally use standard names for the data in their (15) ____. However, programmers "make up" names for the functions (subroutines) in their (16) ____ programs, and they make up dozens of them, essentially creating their own language. But since they dislike documenting their code, the (17) ____o f that language is critical.

Just Make It Up!

Unless naming conventions are enforced or (18) ____ programming is used, whereby one person looks over the shoulders of the other, programmers can make up names that make no sense whatsoever. The bane of (19) ____ is having to modify someone else's program that has unclear names and few comments. It often requires (20) ____ the logic one statement at a time.

In fact, if programmers use careless naming, they can have a (21) ____ time reading their own code later.

From *PC Mag*

3. *Answer the following questions:*

- What is the difference between "source language" and "machine language"?

- What programmes translate "source language" into "machine language"?

- What are ANSI standards?

- What is the difference between low-level assembly languages and high-level languages?

- Why should programmers and companies use standard names?

4. *Discussion/Writing:*

- Explain the expression 'careless naming' used in the article. What can it result in?

PART C *BRIEF SUMMARY OF THE MAJOR HIGH-LEVEL LANGUAGES*

1. *You are going to read an article about major high-level languages. Before you read, discuss the following questions:*

- What high-level languages do you know? How many of them do you use in your work?

2. *Read the following article and match the names of the high-level languages with their brief descriptions.*

Basic	**1** The object-oriented version of C that is popular because it combines objects with traditional C programming syntax
C	**2** Named in honour of Haskell Curry, a logician. It is a standardized purely functional language. It supports pattern matching, definable operators, single assignment, algebraic data types and recursive functions.
C#	**3** The de facto scripting language on the Web. It is embedded into millions of HTML pages
C++	**4** Fast, lightweight scripting language that runs on Windows, Unix/Linux and smartphone platforms
Dart	**5** Originally an academic language developed in the 1970s and named after a French mathematician. The syntax encourages structured programming
Go	**6** Runs on IBM mainframes and OS/2. Used as a general-purpose macro language
Haskel	**7** Developed in the 1970s at AT&T. Widely used to develop commercial applications. Unix is written in C
Java	**8** One of the very popular general purpose scripting languages. It is developed for creating dynamic web pages and supports a command line interface capability

JavaScript	**9** Language and environment for statistical computation and graphics. Derived from the S language it is similar to Scheme
Lua	**10** A scripting language used for system utilities and Internet scripts. Developed in Amsterdam by Guido van Rossum
Objective-C	**11** Created by Apple for its OS in the goal to replace Objective-C by a safer and faster language.
Pascal	**12** The efforts for developing this language initiated in Japan in the 1990s. Similar to Perl, it has a dynamic type system and an automatic memory management. It supports multiple programming paradigms and is a dynamic object-oriented language.
Perl	**13** Version of BASIC for Windows programming from Microsoft
PHP	**14** A Microsoft .NET language based on C++ with elements from Visual Basic and Java
Python	**15** Created by Google, is C and Pascal-like. It is concurrent with a garbage collector, aimed mainly at web services
R	**16** A Java-like language that runs in a Java Virtual Machine (JVM)
Rexx	**17** Superset to JavaScript by Microsoft, with static types, classes and modules. Compiled to JavaScript. Open source under Apache license
Ruby	**18** Developed as a timesharing language in the 1960s. It has been widely used in microcomputer programming in the past, and its various dialects have been incorporated into many different applications
Scala	**19** A scripting language widely used on the Web to write CGI scripts
Swift	**20** The programming language developed by Sun and repositioned for Web use. It is widely used on the server side, although client applications are increasingly used
TypeScript	**21** A version of C used to program Mac and iOS apps
Visual Basic	**22** Web-based programming language from Google. Introduced in 2011, it is said to provide greater performance for Web applications than JavaScript

From *PC Mag*

3. *Discussion/Writing:*

- Which ones of these high-level languages have you learnt and used? Which ones would you like to learn and use?

PART D *DART AND JULIA*

1. *You are going to read an article about two programming languages (Dart and Julia). Before you read, discuss the following questions:*

- Have you ever heard about such programming languages as Dart and Julia? What do you know about them?

2. *Read the following texts and explain the main features of the two programming languages. As you read, complete the gaps (1-11) in each text with the words given in the box*

advantage	changelog	computing	conversion	developers
development	features	framework	hackers	improvements
language	macros	makers	open-source	performance
platforms	processing	programming	playground	rankings

TEXT A

Google releases Dart programming language version 2.1

Google has released a minor update to their Dart programming language, version 2.1, focused on improving its overall (1) _____. These improvements have been promised to reach Flutter for its upcoming 1.0 release.

Dart, one of a few (2) _____languages developed by Google, was originally conceived as an alternative language for web developers to compete with JavaScript. While that plan didn't exactly succeed, Dart has found new life thanks to Flutter, Google's new cross-platform app development (3) _____, which is still in the "release preview" stage.

In August, Dart landed its major 2.0 update, which brought a whole host of (4) _____to the language, many of which were designed around accommodating Flutter and its users. Now Dart version 2.1 has hit release, showing further support for Flutter without leaving behind its web (5) _____roots.

The main goal of Dart 2.1 was to improve performance, rather than add new (6) _____. Web developers will be pleased to know that Dart 2.1 has reduced both the compile time and output size of JavaScript produced by Dart's dart2js compiler tool. Flutter (7) _____will instead see an improvement in their code's performance, with as much as a 39% improvement in type checking.

One subtle change in Dart 2.1 that will improve the lives of Flutter developers is the silent (8) _____of integer numbers to doubles, in cases where a double is expected. This is more about convenience than anything else, as it's just as easy for a developer to type ".0" behind a number as it is for Dart to convert it automatically.

Dart 2.1 is available now and Dart's online (9) _____, DartPad, has already been updated. It seems Flutter app developers will need to wait until the Flutter 1.0 release to take (10)_____of the new Dart changes. We should be learning more about when that release will be early next month at the first ever Flutter Live conference.

You can read more about the other changes in Dart v2.1 like the new "mixin" keyword and compile-time checks from the Dart blog and the official (11) _____.

From *https://9to5google.com/*

TEXT B

Possible Python rival? Programming language Julia is winning over developers

Python is now one of the most popular programming languages among (1) _____and could soon overtake C++. But a much younger language, Julia - a possible alternative to Python - is catching on quickly, according to developer-focused analyst RedMonk.

While developers have been using Python for nearly 30 years, Julia has only been available since 2012 but is now showing up in numerous (2) _____ popularity rankings.

Last week, analysts from the TIOBE (3) _____ language index noted that Julia for the first time made its top 50 list.

Stephen O'Grady, co-founder of RedMonk, has also seen growing interest in Julia, which rose three spots to 36th place over the past three months, according to its latest (4) _____. It also was the fourth quarter in a row it's grown, up from 52nd spot a year ago.

O'Grady notes that RedMonk last week received its first-ever inquiry about Julia and took note because it came from a "large vendor" who asked: "What are your thoughts on Julia? Is it going to remain a niche language or grow or die?"

Its growing popularity could be explained by the goal Julia's four (5) _____outlined when they unveiled it in 2012: to create a perfect language that suited their tasks in scientific (6) _____, machine learning, data mining, large-scale linear algebra, distributed and parallel computing

"We want a language that's (7) _____, with a liberal license. We want the speed of C with the dynamism of Ruby. We want a language that's homoiconic, with true (8) _____like Lisp, but with obvious, familiar mathematical notation like Matlab," they wrote.

"We want something as usable for general programming as Python, as easy for statistics as R, as natural for string (9) _____as Perl, as powerful for linear algebra as Matlab, as good at gluing programs together as Shell. Something that is dirt simple to learn, yet keeps the most serious (10) _____happy. We want it interactive, and we want it compiled."

According to Julia's makers, who also run the company Julia Computing, Julia has been download two million times.

Julia, nonetheless, remains a long way behind older and more widely-taught languages, as well as newer but fast-growing languages driven by mobile (11) _____, such as Kotlin for Android developers, and Swift, Apple's language for iOS developers and replacement for Objective-C.

From *www.zdnet.com*

3. *Answer the following questions:*

TEXT A

- What was the purpose of creating Dart?

- What is the main goal of Dart 2.0?

- Where can you find out more about Dart and its improvements?

TEXT B

- What can explain the growing popularity of Julia?

- What tasks is Julia best suited for?

- What features of other programming languages is Julia designed to have?

4. *Discussion/Writing:*

- Are these programming languages going to remain niche languages or grow or die?

PART E *JAVA & JAVASCRIPT*

1. *You are going to read an article about Java and JavaScript. Before you read, discuss the following questions:*

- What is Java? What is JavaScipt? Are these languages popular among programmers?

2. *Read the following article and explain the difference between Java and JavaScript. As you read, decide which of the fragments (I-X) given below fit into the gaps in the texts (1-10).*

JAVA An object-oriented programming language from Oracle that is platform independent. Developed by Sun in the early 1990s (Oracle acquired Sun in 2010), and (1) _____, Java was originally designed for embedded applications in set-top boxes and other consumer electronics.

Java ignited a revolution when Sun transitioned it to the Web in 1994, and although Java has been (2) _____ (the user's machine), Java on the server became very popular.

When a Java program is launched from a Web page, the program is called a Java "applet". When (3) _____, it is a Java "application." When running in a Web server, it is a Java "servlet."

Java embodies the "write once-run anywhere" model; (4) _____. For example, a Java servlet can be moved from a Unix server to a Windows server. Sometimes, a little tweaking is necessary; sometimes a lot, but Java is closer to "write once-run anywhere" than previous development platforms.

This is accomplished by compiling Java source code into an intermediate language called "bytecode." In order to run the bytecode, it is either entirely compiled into machine code and then run or executed a line at a time via the Java interpreter, which is (5) _____ the "Java Virtual Machine" (JVM). There are JVMs for all major hardware platforms, and this intermediate bytecode is what makes Java "cross platform," "platform independent" and "write once-run anywhere," all meaning the same thing. When users are asked to update Java from time to time, it is the Java runtime engine that is being updated.

JAVASCRIPT A popular programming language that is (6) _____ and other Web tools. It enables interactive functions to be added to Web pages, which are otherwise static. JavaScript evolved from Netscape's LiveScript language.

JavaScript is embedded into Web pages, and because it is (7) _____, it cannot be used to probe the computer's resources. Java is a full-blown programming language that can manipulate any resource in the computer. However, both JavaScript routines and Java programs (applets) activated from a Web page are "sandboxed" and do not have (8) _____.

Although there are commonalities, JavaScript is not a subset of Java, but it can be used in conjunction with it. For example, a JavaScript script could be used to (9) _____ and validate the input, while a Java applet or Java servlet processes the information.

Unlike Java, JavaScript programs are not compiled into an intermediate bytecode language. JavaScript source code remains (10) _____ in the Web page. Along with myriad other functions, JavaScript is used to enable interactive page elements such as navigation buttons and drop-down menus. It is also used to identify the page to analytics servers that capture traffic statistics.

From *PC World*

I	full reign of the machine
II	intact between Begin-Script and End-Script HTML tags
III	a runtime engine known as
IV	executed merely by retrieving a page from any Web site
VI	run without the Web browser on a user's machine
V	reasonably successful on the client
VI	run without the Web browser on a user's machine
VII	modelled after C++
VIII	display a data entry form
IX	the Holy Grail of computing for decades
X	supported in all Web browsers

3. *Answer the following questions:*

- When and for what purpose was Java originally designed?

- What is a Java "applet"? What is a Java "servlet"?

- What is the "write once-run anywhere" model?

- What is the "Java Virtual Machine"?

- What is JavaScript mostly used for?

- What are the commonalities between Java and JavaScript?

- What is the difference between Java and JavaScript?

4. *Discussion/Writing:*

- Do you use Java or JavaScipt? What do you think of these languages?

PART F *TEN INTERESTING FACTS ABOUT PYTHON*

1. *You are going to read an article about Python. Before you read, discuss the following questions:*

- Do you like Python? Why/Why not?

2. *Read the following article and explain the ten facts about Python. As you read, match the subheadings (A-J) given below with the sections of the text (1-10).*

A. Python has C and Java variants	**F.** Python is more like English
B. Python is one of the official languages at Google	**G.** Python does not support pointers
C. Python has a wide range of application	**H.** Why it is known as 'Python'
D. Python has overtaken French in primary school	**I.** Function unpacking
E. Python is an open-source language	**J.** Python does not require a compiler

The name itself sounds interesting. Right? Well, there are many interesting things that you need to know about Python programming language.

1. _____

This is the first interesting fact about this language. Why the name 'Python' and not any other name? Did the creator of this language have some bond with the python snake? According to the creator Guido Van Rossum, the name of this language was derived from the British comedy series "Monty Python's Flying Circus". The comedy was aired on BBC during the 1970s and it gave the creator some form of entertainment during the language development. Also, Van Rossum wanted a name that was short, and mysterious. Something that will capture everyone's attention.

2. _____

This one sounds interesting right. Believe it or not, in 2015, Python overtook French to be the most popular languages that are taught in primary schools. Statistics revealed that 6 out of 10 parents preferred their children to learn Python instead of French. This just shows that many people appreciated the importance of Python programming. The same applies to children. The same statistics revealed that 75% of primary school-going children preferred to learn how to control a robot instead of learning French.

3. _____

As a high-level and interpreted language, Python does not need a compiler. This is unlike Java and C++, which have to be compiled first before being interpreted. For Python, it relies on an application known as an interpreter. The Python byte code is stored in the form of a .pyc file which is then executed by an appropriate virtual machine. This machine acts as a run-time engine of Python.

4. _____

Despite being an independent programming language, Python has variants for C and Java programming languages. The C variant is known as CPython and is designed to give Python the advantages of C. One of these characteristics is in terms of performance. The variant can act both as an interpreter and at the same time as a compiler. The Java variant of Python is known as Jython. It brings some key aspects of Java such as productivity and enables them to run on a virtual machine.

5. _____

Despite the massive popularity that it enjoys, Python is an open-source language. This means that it has all the features of an open-source language. It does not have a proprietary license that controls who uses it. As an open-source language, members of the Python community are allowed to make their contributions into the Python ecosystem.

6. _____

Do you know that Python is one of the official programming languages that are used at Google? The language has been part and parcel of Google thanks to its efficiency and portability. It is an easy language to use even when developing big and complex projects. Google Search and YouTube are just some of the products that are powered by Python. There are several Google APIs and libraries that are based on Python programming.

7. _____

Many people say that Python is easy to read. The main reason for this claim is that Python is more like English. You can easily understand what every line of code is doing. Everything is straight forward and direct to the point.

8. _____

You can build anything you want using Python. The language can be used for web development, mobile app development, AI, machine learning, Big data and internet of things applications.

9. _____

Unlike other programming languages, Python does not support pointers. Instead, objects are passed by reference.

10. _____

This is another interesting fact about Python programming. You can easily unpack a list of all the functions that you have used.

From *http://bharathreddykv.blogspot.com/*

3. *Answer the following questions:*

- Where does the name 'Python' come from?

- Why did Python overtake French in primary schools?

- What helped Python to become the official language of Google?

- Why do many people say that Python is easy to read?

4. *Match the highlighted words with the meaning below:*

- the network that drives the creation and delivery of information technology products and services

- simple and easy to understand

- to make known something that was previously secret or unknown

- to be a necessary feature of something

- to broadcast a programme on television or radio

- software that is designed to aid the execution of a computer program while it is running

- to develop or come from something else

5. *Discussion/Writing:*

- Which of the facts about Python seems interesting/not interesting to you?

PART G *MICROSOFT LAUNCHES NEW LOW-CODE PROGRAMMING LANGUAGE POWER FX*

1. You are going to read an article about a new low-code programming language. Before you read, discuss the following questions:

- What is a low-programming language? What low-programming languages do you know?

2. *Read the following article and explain the main features of Power Fx. As you read, complete the gaps (1-16) using the words given in the left column to form words that fit in the spaces in the passage with the same number.*

Microsoft, in its Ignite 2021 conference, introduced a new programming language known as Power Fx, its first low-code programming language for logic (1) _____ across Power Platform applications and Microsoft clouds. The language is rooted in Excel and utilizes the (2) _____ of Excel users to make it easier for citizen developers to perform low-code (3) _____. It also takes elements from tools and languages like Pascal, Mathematica, and Miranda.

Power Fx, which will be open-sourced on GitHub, is set to provide familiar concepts to millions of users. It is a language expressed in text that users can work with (4) _____, said Charles Lamanna, corporate vice president of the Low Code Application Platform at Microsoft. "Programming languages are very much in our DNA," Lamanna said, noting that Microsoft has delivered at least four languages that have been widely adopted, including Visual Basic, C#, F#, and TypeScript.

"Something that we noticed is that for low-code, no-code, where there are all these (5) _____ expression languages, there really wasn't a name for these things," he said. "And there wasn't a community or open-source (6) _____ around these little local programming languages."

While Power Fx will become the standard for writing logic customization across Power Platform, it is expected to become the de-facto standard for these kinds of use cases. (7) _____, it will be used to develop canvas apps in the Power Apps service and in time, become "the consistent language" across the whole Power Platform.

Power Fx will enable the Microsoft Power Platform to become more (8) _____, (9) _____, and easy to learn, enabling makers to leverage their learning of one Power Platform solution with others. It will also enable more (10) _____, enhanced (11) _____ controls, and solution checker (12) _____, with more (13) _____ and solution telemetry. The language is set to bring true (14) _____ to the Platform over the next 24 months, with its use expanded across Power Apps' Model-driven customizations, Dataverse Data Components and calculated columns, Power Virtual Agents, and Power Automate.

Lamanna said that this is a rallying cry to create an entire ecosystem and focus on other places where Power Fx could show up, adding that he hopes that it would become a common concept, like JavaScript or TypeScript. "We think these new languages have been (15) _____ underserved," he said. "They have not gotten the same level of (16) _____, attention, and community that we see for professional developer programming languages." From *https://thetechportal.com/*

1 custom

2 know

3 develop

4 direct

5 experiment

6 adopt

7 current

8 intuition

9 approach

10 transparent

11 govern

12 capable

13 visible

14 consistent

15 history

16 treat

3. *Answer the following questions:*

- What are the 'roots' of Power Fx?

- What are the main features of Power Fx?

- What is Power Fx's purpose?

4. *Discussion/Writing:*

- Do you think that Power Fx will become a common concept, like JavaScript or TypeScript? Why/Why not?

PART H *PROGRAMMING LANGUAGES YOU'VE NEVER HEARD OF (BUT MIGHT JUST NEED)*

1. *You are going to read an article about some rare programming languages. Before you read, look at the names of these languages and tell what you know about them:*

Coq	***Morse Code***	***MUMPS***	***Racket***	***ScummVM***	***Shsql***

2. *Read the following article and explain the main features of the programming languages discussed by the author. As you read, complete the gaps with the names of programming languages listed above.*

The last two or three decades have been a rather ho-hum time for computer languages, at least on the level of basic syntax. The C-style structure rose to dominate the world, as first Java and then JavaScript came along, sporting the same basic punctuation. Oh sure, there are serious differences under the hood, but to a casual observer glancing at someone's screen while walking past a cubicle, they all look about the same. Python is the only real big shift, and its main contribution to syntax was getting rid of the curly brackets. But just because there's been a great convergence in the dominant languages doesn't mean that everything is the same. Programmers love to experiment, and they continue to create new languages to solve problems — and one of these languages might be just what the doctor ordered.

[1] _____*: Not just for cyber criminals anymore*

This one wasn't developed with the best of intentions. Whoever built the [redacted] programming language was almost certainly out to steal your personal information and maybe even break into your bank account to take everything you've earned. But there's something clever about a system that encodes instructions in dots and dashes. Yes, those dots and dashes are eventually turned into regular characters for compilation. Yes, any regular substitution cipher would do the same thing. Yes, it's not really a new language; it's more a new character set at best.

[2] *Take the _____ adventure*

Many classic adventure games were written in a domain-specific language optimized for game play that involves moving through a sequence of nodes with descriptions and occasional objects. Several languages were created over the years to support such games, and LucasFilms called its version Script Creation Utility for Maniac Mansion. Anyone who wants to explore these realms,

pick up their virtual objects, and solve the mysteries can still do it. [redacted] is a modern, GPL-protected, game-playing engine that will read [redacted] files and take you back into those magical worlds. Some people are even writing new [redacted] encounters.

[3] _____ *database: For command-line aficionados*

Some users expect their databases to work with beautiful graphical interfaces that let you browse through the data with the greatest of ease. But the folks who created [redacted] don't need pretty pictures, cute clickable icons, or morphing layouts.

They like the command line, and they want to be able to create, update, or delete data from the shell. [redacted] is Structured Query Language, but it's integrated with the operating system and sits ready to store your data from the command-line interface.

[4] _____ *is not just for Fortran*

In the 1960s, Fortran was the dominant language, with new features coming out all the time. People joked that they weren't sure what programming would be like in the future, but they knew it would be called Fortran. They weren't entirely wrong. [redacted] gives Fortran lovers a way to use the data structures, scientific approach, and coding styles they've always loved. It's backward-compatible with Fortran 77, so you can link to your old code, even if it's stored as a dusty deck of punch cards.

[5] _____ *is about more than medical records*

[redacted] was born in the 1960s, when the hospital industrial complex first began to talk about electronic medical records. [redacted] stood for "Massachusetts General Hospital Utility Multi-Programming System." That name stuck until 1992, when someone tried to compete with the newfangled C by giving it the single-letter name of M. The developers were far ahead of the game because they understood the value of creating solid, ACID (atomic, consistent, independent, and durable) transaction support for tracking medical records. Today, [redacted] user group updates the buzzword by noting that [redacted] was one of the first to offer a "reliable schema-less" or "NoSQL" database system, conceptually similar to Amazon SimpleDB and Google BigTable, but with the advantage of a much longer, time-tested track record of success. It's old but still ahead of its time.

[6] _____*: When you need to play by the rules*

The more theoretical software developers like to say that a program is a mathematical proof and a good mathematical proof is also a program. [redacted] is a language for mathematicians to write out a strictly logical proof, but it's also not much different from software development. The language lets you specify definitions and then knit them together into algorithms and theorems. The compiler's job is not to turn your proof into an executable, but to check to make sure it obeys all of the rules. Mathematicians can use the language to ensure their proofs are solid. Programmers who need to implement algorithms that are even slightly mathematically complicated can prove out their approach to ensure that it's trustworthy.

[7] *a new language with* _____

[redacted] is a newer version of the superflexible LISP language, and one of its main purposes is to create new languages. A cynic may see a parallel in the way that tax collectors send out tax bills to fund the training of new tax collectors. There's more to it, though. The language is optimized for building the parsers, tokenizers, and output generators needed to create specialized languages.

From *https://techbeacon.com/*

3. *Answer the following questions:*

- Which of the languages was created with criminal intentions?

- Which of the languages is the game-playing engine?

- Which of the languages stores your data from the command-line interface?

- Which of the languages is backward-compatible with Fortran 77?

- Which of the languages was one of the first to offer a "NoSQL" database system?

- Which of the languages helps mathematicians to write out a strictly logical proof?

- Which of the languages creates new languages?

4. *Discussion/Writing:*

- Do you agree that the last two or three decades have been a rather 'ho-hum time for computer languages'? Why/Why not?

PART I *THE TEN COMMANDMENTS FOR LEARNING HOW TO CODE*

1. *You are going to read an article giving some tips for developers. Before you read, discuss the following questions:*

- What qualities do you need to be a good developer? Do you have them?

2. *Read the following article and name three tips which you considered to be the most useful.*

Programming is an exercise in learning how to learn. Start small, practise often and don't be afraid to make mistakes. Many coders say that getting started is the hardest part. "I don't have time to learn it." We've all said it — some of us are still saying it. Many dream of being more data savvy, and so resolve to learn R (or Python, or C or whatever programming language is currently trending). But when it comes down to it, who has time to pick up an entirely new programming language from scratch? Unfortunately, nothing written here will make you a coding whizz overnight, but most coders acknowledge that getting started is the hardest part. If you want to learn but don't know how, here are a few tricks that have helped me.

1. Set goals that will immediately help your daily life. I've always been interested in programming. I know that being an experienced programmer will make a lot of things much easier. But no matter how good my intentions, I cannot make myself spend all my spare time on self-improvement. Instead, the things I've learnt have come about because I needed to get something done, fast. When I started preparing figures for publication, I learnt how to use ggplot2, a data-visualization package in R. When I needed to write a 200-page thesis, I learnt about the wonders of the LaTeX typesetting system. Command-line tools (for example, awk and sed) helped me to quickly manipulate large tables and text files. Jupyter notebooks allowed me to keep detailed notes and perform exploratory analysis by testing chunks of Python code. Compute clusters gave me the ability to run thousands of computationally intensive jobs in parallel. Instead of learning for the sake of it, you should set goals that will immediately prove useful.

2. Don't try to learn everything at once. Likewise, don't get intimidated by the prospect of learning a whole new language. You don't need to learn all of R — you just need to know enough to complete the specific task that you've set yourself, and then the next one, and so on. You will find that the language's syntax will get easier with time, and you can always refer to the reference material. The fastest way to learn is to jump straight in and start playing around.

3. Separate problems into achievable chunks. Programming is all about problem-solving. Think about what you want to achieve and write down a series of steps that will get you to your goal. Then, all you need to do is work out each step and stitch them together. Your first solution doesn't need to be elegant or all-encompassing; it just needs to work well enough for you to move on to the next step.

4. Don't be afraid to break things. The quickest way to discover how something works is to break it and then try to fix it. Set up a workspace with test files, download some code snippets and try changing one line at a time. Print the output each time. Then, once it makes sense to you, try to write it in a different way, or using a different language. Sometimes, you'll break things you don't want to break: we've all been there. Accidentally deleting all the files from an important folder is basically a rite of passage in some operating systems. It's OK. You'll make mistakes and learn from them. The worst mistakes tend to leave the biggest impressions, so you'll probably never make them again.

5. Learn about version control. You want to make sure that your truly important files and scripts are backed up. That does not mean saving them with various titles and dates on unnamed USB drives. Version-control systems exist precisely so that you don't have to worry about remembering every change you make to source code or documents. I'm a big fan of Git — because with five basic commands and no expert knowledge, I've been able to use it happily for years.

6. Ask other developers. I often think I'd be a better programmer if I didn't have the global knowledge of the masses at my fingertips. But so far, I've never had a coding-related problem that I couldn't eventually solve using online programming communities, such as Stack Overflow or Biostars. Most of the time, someone has already asked my exact question on an online forum.

7. Never repeat anything more than once. Good programmers are hard-working; great programmers are lazy. So lazy, in fact, that they refuse to repeat menial tasks. Need to rearrange columns in a spreadsheet? A computer can do that for you. Need to repeat an analysis and redo all your figures? An automated pipeline will have that done in no time. You might think it's quicker to do it manually, especially because you don't need to think about it or learn something new. And for a lot of things, that might be true. But the next time you repeat that same task, stop and think: do you want to do it a third time?

8. Schedule 'learning time' into your week. In my PhD lab, we had a Tuesday morning ritual. Between 9 a.m. and 10 a.m., we would practise programming in the Go language by working through problems on the Rosalind platform, designed for those learning bioinformatics. Afterwards, we would all have coffee. Anyone who skipped the hacking session had to buy coffee for everyone else. In this way, we worked together towards a common goal of becoming better programmers (and, inadvertently, caffeine addicts). Since then, all of us have moved labs or countries. But such regular learning time has remained an essential part of my weekly routine. Each week, I set aside an hour to learn something new. Sometimes it's how to use a new R package. Sometimes it's a cool new software tool I've seen on Twitter and have been meaning to try. Sometimes I work in a group; sometimes it's just me. No matter how busy I am, my learning time keeps me sane and ensures slow but steady progress.

9. Go to local workshops and meet-ups. Many universities and companies provide introductory workshops for common programming languages and techniques. These are often worth going to, even if you're not a beginner: you'll meet fellow coders and can bring your own questions to ask

the demonstrators. A lot of scientists also get together to program, brunch and network, so be sure to check out your local Meetup groups.

10. Start today. If you're reading this, you might already have learnt something new.

From *www.nature.com*

3. *Explain the meaning of the highlighted words and expressions.*

4. *Discussion/Writing:*

- What do you do to be a good developer? Give five tips of your own.

9. RECENT DEVELOPMENTS

PART A *ROBOT DUO SET TO PLANT TREES*

1. *You are going to read an article about robots. Before you read, discuss the following questions:*

- What is a robot? What jobs/tasks can robots do?

2. *Read the following article and explain how robots are used to plant trees. As you read, decide which of the sentences (A-F) given below fit into the gaps in the text (1-5). There is one sentence that do not need to use.*

Pair of automatic foresters could plant thousands of seedlings in a day

The Tin Woodman first appeared in Frank Baum's The Wonderful Wizard of Oz 120 years ago. Now real robot foresters are making their debut, planting trees rather than cutting them down.

The robotic foresters are the work of Milrem Robotics in partnership with the University of Tartu, both based in Estonia. [1] _____One type is a planter, the other a brush cutter, and both are autonomous. Each is the size of a small car and weighs about a tonne.

The planter carries more than 300 seedlings at a time and will plant a hectare of new forest in 5 to 6 hours, totalling between 1000 and 3500 seedlings depending on the species. [2] _____ Armed with this data, the brush cutter, equipped with a cutting tool and precision sensors, removes vegetation around the seedlings.

Gert Hankewitz at Milrem Robotics says the robot foresters' tracks exert less pressure on the ground than human feet and won't damage the soil. Precise navigation is challenging, though, and requires a combination of laser-based LIDAR sensors, cameras and GPS. LIDAR provides a 3D geometric representation of the environment, but gives relatively little data. [3] _____ "All the data is fused in real-time, complementing each other, and making autonomous driving in a forest a possibility," says Hankewitz. The cameras are also used for image recognition and provide a visual display for the operator if they need to drive the robot manually.

The plan is for the robots to be largely autonomous, which presents challenges in surroundings that are unstructured and chaotic, unlike the open roads faced by self-driving cars and other robots. Developers are tackling this with machine learning, using simulations for conditions that may not occur frequently in real life. [4] _____ "The robotic foresters will carry out the operation almost autonomously," says Hankewitz. "The human operator, who will supervise four or five robotic foresters, will intervene only when necessary."

Andrew Davison at Imperial College London says that in a cluttered forest the cameras and LIDAR sensors complement each other and enable the robots to identify obstacles and plot a course as they go. [5] _____

From *New Scientist*

A This means the robotic foresters should be able to tell whether they can cross a given slope, ditch or stream, for example, without getting stuck.
B The hope is the robot foresters will cost less than manual forest replanting or mechanized approaches with excavators.

C It also records the exact location of each tree.
D "This is one of many interesting applications emerging which show that mobile robotics technology is maturing fast and enabling robots to tackle new types of tasks in difficult environments," says Davison.
E Two versions are under development based on the company's range of driverless ground vehicles.
F High-resolution camera images fill in the gaps.

3. *Answer the following questions:*

- What are the two types of the robotic foresters? What do each of them do?

- In what way are the robotic foresters better than human foresters?

- What are the main challenges for the developers?

4. *Discussion/Writing:*

- Can you name other jobs/tasks that robots can do instead of people?

- Are there any areas in which people cannot be replaced by robots?

PART B *ROBOTS RAISE WAGES FOR ALL BUT …*

1. *You are going to read an article about a connection between automation and people's salaries. Before you read, discuss the following questions:*

- Do you think using robots in industries influences people's salaries? If yes, in what way?

2. *Read the following article and explain the main features of the Surface Earbuds. As you read, decide which of the passages (1-8) given below fit into the gaps in the text (A-G). There is one passage that do not need to use.*

When industries replace workers with robots, wages rise for all on average due to (1) _____ gains, but the difference in pay for men and women (2)_____.	1 PRODUCT
Cevat Giray Aksoy at King's College London and his colleagues analysed the effects of (3) _____ in 20 European countries using data from the statistical office of the European Union. They found that the number of robots per 10,000 workers increased, on average, by 47 per cent in recent years. On average, a 10 per cent rise in robot workers in a country led to a 1.8 per cent rise in the discrepancy in pay between genders.	2 WIDE 3 AUTOMATE 4 PROPOTION

Aksoy and his team say this is because there are more men in medium- and high-skilled jobs, and these roles (4) _____ benefit from automation. They say progress in recent decades to reduce the gender pay gap could be quickly (5) _____ by automation. On average, the introduction of minimum wages reduced the gender pay gap by around 2 per cent, so robots have had a much larger effect.

5 EROSION

6 WIDE

The (6) _____ of the gender pay gap was more pronounced in countries where gender (7) _____ was already high and labour laws provide less support for women in work. In countries where gender inequality was low, automation had no (8) _____ significant effect on the gender pay gap.

7 EQUAL

8 STATISTICS

"Governments should force companies to be more transparent when it comes to their pay schemes, so we can see where discrepancies are coming from," says Aksoy. He thinks governments should introduce coding and high-tech skills to school curricula and provide (9) _____ support for education among adults to help people train for new careers when jobs are lost to automation.

9 GO

10 SURE

"But at the same time, they should (10) _____ that the system and the labour market is fair to everyone," he says.

From *New Scientist*

3. *Answer the following questions:*

- In what kind of jobs are people replaced by robots?
- When industries replace workers with robots, what happens to wages: do they rise or fall?
- Do men and women equally benefit from automation?
- Why does a rise in robot workers lead to a rise in the discrepancy in pay between genders?
- In what countries is the gender pay gap more evident?

4. *Discussion/Writing:*

- What should government do to help people whose jobs are lost to automation?
- What can be done to ensure that the labour market is fair to everyone?

PART C *AI SMASHES VIDEO GAME HIGH SCORE*

1. *You are going to read an article* about an artificial intelligence. *Before you read, discuss the following questions:*

- What is an artificial intelligence? What is it used for?

2. *Read the following article and explain how the researchers tried to improve the AI performance. As you read, complete the gaps (1-7) with the expressions given in the box.*

an archive of memories	better solutions	reinforcement learning	screen grabs
the human world record	emulator	all the different approaches	

Learning from previous successes can help an artificial intelligence perform better.

An artificial intelligence that can remember its previous successes and use them to create new strategies has achieved record high scores for some of the hardest video games on classic Atari consoles.

Many AI systems use [1] _____, in which an algorithm is given positive or negative feedback on its progress towards a particular goal after each step it takes, encouraging it towards a particular solution. This was used by AI firm DeepMind to train AlphaGo.

Adrien Ecoffet at Uber AI Labs and OpenAI in California and his colleagues hypothesised that such algorithms often stumble upon encouraging avenues but then jump to another area in the hunt for something more promising, overlooking [2] _____.

"What do you do when you don't know anything about your task?" says Ecoffet. "If you just wave your arms around, it's unlikely that you're ever going to make a coffee."

To solve this problem, the team created an algorithm that remembers [3] _____, it has tried and keeps returning to moments in which it had a high score as a starting point from which to explore further.

The software stores [4] _____, from a game as it plays to remember what it has tried, grouping together similar-looking images to identify points in the game it should return to as a jumping-ff point. The algorithm's aim is to maximise its score, and when it reaches a new high score, it updates its record of the particular starting point it used with a new screen grab from that part of the game.

Atari games don't normally allow players to revisit any point in time, but the researchers used an [5] _____, – software that mimicked the Atari system – with the added ability to save game states and reload them at any time. This meant the algorithm could begin from any point without having to play the game from the start.

The team set the algorithm to playing a collection of 55 Atari games that has become a standard benchmark for reinforcement learning algorithms. It beat state-of-the-art algorithms in those games 85.5 per cent of the time. In one particularly complex game, Montezuma's Revenge, the algorithm scored higher than the previous record for reinforcement-learning software and also beat [6] _____.

Once the algorithm reached a sufficiently high score, the researchers used its solution to train a neural network to play the game the same way, doing away with the need for reloading save states

with an emulator. Peter Bentley at University College London says the team's approach of combining reinforcement learning with [7] _____, could be used for more complex problems.

From *New Scientist*

3. *Answer the following questions:*

- What algorithms did the team of researchers use and why?

- What are the elements of the team's approach?

- Was this approach successful?

4. *Match the highlighted words with the meaning below:*

- n area of machine learning concerned with how intelligent agents ought to take actions in an environment in order to maximize the notion of cumulative reward

- using the most modern and recently developed methods, materials, or knowledge

- hardware or software that enables one computer system to behave like another computer system

- a place to start from

- something that is used as a standard by which other things can be judged or measured

5. *Discussion/Writing:*

- How is AI trained? Have you ever participated in such a task?

PART D ***WHAT CAN ARTIFICIAL INTELLIGENCE DO?***

1. *You are going to read an article about various tasks that AI can do. Before you read, discuss the following question:*

- What sort of tasks can AI perform nowadays?

2. *Read the following articles and explain AI performs the tasks discusses in these articles. As you read, decide which of the fragments (A-H) given below fit into the gaps in the text (1-8).*

TEXT A

AI can tweak VR videos to stop cybersickness

When using virtual reality, the discrepancy between what you see and [1] _____ is happening can provoke a form of nausea known as cybersickness. AI that adapts VR scenes to match the motion of the head more accurately can reduce this.

Most VR technology uses three degrees of movement. What you see changes when you tilt, nod or rotate your head. However, it [2] _____ – that is, forwards and backwards as when walking,

up and down as when crouching or standing up, and side-to-side when sidestepping. Walk around while watching a 3D video in a VR headset that was filmed from a static point and you may succumb to cybersickness as it won't reflect all your movement.

Researchers at UK firm Kagenova have created a system that reacts to these additional degrees of freedom, and a [3] _____. Kagenova's software uses AI to slightly alter images from 3D videos to take account of movement from one spot to another. The software can adapt existing images so no new technology is required to record footage, and it can work with any VR headset.

To see how well the new approach worked, Elisa Ferrè and her colleagues at Royal Holloway University of London ran tests to compare a standard VR set-up with one using Kagenova's software. The team got 25 people to use HTC Vive headsets to view 3D footage of a beach using both set-ups. The participants reported 33 per cent less nausea [4] _____.

Ferrè believes that the benefits would be even larger in a more "compelling visual scenario" that included more movement.

From *New Scientist*

TEXT B

AI can scour globe instantly to pinpoint just about anything

Artificial intelligence that hunts through billions of aerial and satellite images can find buildings or land features that are alike in one-tenth of a second. This could help researchers identify where forests or farms are, or [5] _____.

Xander Rudelis and his colleagues at Descartes Labs, a geospatial data firm in New Mexico, developed the tool, which can identify similar places around the world [6] _____ – for example, a power plant, forest or car park. Rudelis says it could be given very specific tasks. "Can you find every anti-aircraft gun in North Korea – questions like that."

To create the AI, the team customised [7] _____, such as plants, animals and vehicles. They trained it using the US National Agriculture Imagery Program database – which contains 2 billion aerial images from 48 US states – as well as images from around the world captured by Landsat 8, a US Earth-observation satellite. The AI uses 512 visual cues, including shapes and colours, to find similar scenes, such as rows of boats that indicate a marina.

For 10 types of feature, [8] _____ was 86 per cent. This varied from 36 per cent for planes to 100 per cent for storage tanks and rail yards.

A version of the AI is online for public use. The tool could be used to track the effects of climate change on landscapes or to find certain natural features, such as forest or rock types, he says. But military-type applications would require further refinement of the tool, he says.

From *New Scientist*

A when given a certain feature
B doesn't take into account translational motion
C the average number of correct matches in the top 30 listed by the AI
D when experiencing VR with six degrees of freedom compared with just three
E one that was already trained to classify features in photographs
F study has shown that it reduces VR-induced nausea
G could be used by the military to find bases or specific weapons in other countries
H what your inner ear tells you

3. *Answer the following questions:*

- What is cybersickness? (Text A)

- What approach has researchers developed to reduce cybersickness? (Text A)

- What can AI that 'can scour the globe' be used for? (Text B)

- How is AI trained? (Text B)

4. *Discussion/Writing:*

- Do you think that artificial intelligence will be able to overtake human intelligence? Substantiate your position.

PART E *ALL ABOARD THE QUANTUM BANDWAGON*

1. *You are going to read an article about quantum computing. Before you read, discuss the following question:*

- What is quantum computing? What tasks can it solve?

2. *Read the following article and explain why the author compares booming quantum computing to a 'bubble'. As you read, complete the gaps (1-18) with one suitable word.*

Money is pouring in to developing quantum computers, but no one is quite sure what they are for, reports Leah Crane

Quantum computing is booming, but is it a bubble? At a gathering of experts on this technology in California last month, nobody seemed to know how, or even if, it will turn (1) _____ to be useful. The race for quantum supremacy may be over, but the race for a useful quantum computer is still (2) _____.

Quantum supremacy refers to the point at which a quantum computer can solve a problem that (3)_____ classical computer could in a reasonable amount of time – a feat Google said it had achieved in October with an algorithm proving that strings of bits were random.

While that problem has no real practical value, it was a great demonstration that quantum computers (4) _____ work. What most people are still waiting for is quantum advantage – the point at which these computers are better than classical computers for performing a useful task. A mix of researchers and investors in quantum computing gathered in December at the Q2B Practical Quantum Computing conference in San Jose, California, to discuss when and how (5) _____ might happen.

The conference has more than doubled in size since its first event three years (6) _____, now attracting more than 500 people. Announcements during the gathering of linkups between quantum computing companies and firms (7) _____ Ford and investment bank Goldman Sachs also point to rapidly growing interest in the field in the wider (8) _____.

But listening to the speakers, it was not clear what anyone expects from this boom. Many discussed how quantum computers are expected to be (9) _____ to simulate molecules and chemistry better than classical machines, which could result in new materials and drugs. Others spoke of optimising

stock portfolios and other big-data problems in the financial sector. Whether we will be able to build a quantum computer that is actually significantly better than a classical computer (10) _____ doing any of that is still up in the air.

That is not deterring investors from jumping on the bandwagon though. "If you wait for *New Scientist* or someone to say we're now at quantum advantage before you start looking into quantum computing, it could take two years before you're ready to take (11) _____ of it," says Bill Hartnett at investment bank Citi. "There's a sort of insurance aspect to it."

Oliver Wick, who leads BMW's quantum computer group, has a similar view. "It's like a 100-metre race. We have to get ready, because if we aren't ready for the race, then when it begins, we will have a hard time (12) _____ started," he says. "I don't have a business case, it's just about readiness." But researchers at Q2B also spoke about avoiding hype and the idea that quantum computing will solve every type of computing problem. "Quantum computers are not general-purpose devices," said IBM's Katie Pizzolato. "They will always be best when they are applied (13) _____ the right problems."

For now, though, it is not clear what the right problems will be. "It may be that we'll find useful applications, but we can't guarantee it," said John Preskill at the California Institute of Technology. "I think we have reason to be optimistic about quantum technology having a transformative effect (14) _____ society eventually, but that may take decades of hard (15) _____ and investment."

How long it takes will depend on (16) _____ the current appetite for funding quantum computing holds up. "There is a real risk of running (17) _____ of goodwill and funding in the meantime," said Google's Ryan Babbush. If that happens, we may never learn what quantum computing is really (18) _____ for.

From *New Scientist*

3. *Answer the following questions:*

- What is quantum supremacy?

- What is quantum advantage?

- What is the possibility to build a quantum computer that is significantly better than a classical computer is still up in the air?

- What kind of problems should quantum computers be applied to?

- Why are investors so interested in quantum computing at this stage?

4. *Explain the meaning of the highlighted words and expressions.*

5. *Discussion/Writing:*

- What future do you envision for quantum computing?

PART F ***10 BURNING MICROSOFT SURFACE DUO QUESTIONS***

1. *You are going to read an article about Microsoft Surface Duo. Before you read, discuss the following questions:*

- Do you know what Microsoft Surface Duo is? In what way is it different form other smartphones?

2. *Read the following article and explain the main features of the Surface Duo. As you read, match the question given below with the answers given in the article (1-10).*

Will it have a headphone jack?
Will it have 5G?
What kind of processor will it use?
What kind of an Android skin does it have?
What's the quality of the camera?
What will gaming look like?
How much storage and RAM is inside it?
What's the resolution of the Surface Duo displays?
How much does it cost?
What's the battery life like?

Look out Samsung Galaxy S11, iPhone 12, and Google Pixel 5: There's a new kid in town - or at least there will be, by the time all of those phones launch in 2020. Microsoft on Wednesday gave us a sneak peek of the Surface Duo, its first smartphone since the ill-fated Windows Phone, and it's definitely unique. Something of a cross between a laptop and a Galaxy Fold, the Surface Duo is a device with more questions than answers. What we know for sure is that it runs Android and needs to be opened like a laptop to be used, but there are so many more things we need to know before it goes on sale late next year, like:

1 _____

The centerpiece of the Surface Duo is obviously the dual display. Microsoft revealed that the phone uses a pair of 5.6-inch screens. But that's all we know about them. Are they 2K resolution like the Surface Pro X or Quad HD like the Galaxy Note 10+? Are they OLED or PixelSense IGZO screens? Are they 60Hz or 90Hz? Can you watch a movie full-screen, and have it span across the hinge? Smartphone display tech has advanced in leaps and bounds since the days of the Windows Phone, so the Surface Duo needs to start with a killer screen.

2 _____

In its exclusive look at the Surface Duo, Wired noted that the unit it saw was powered by a Snapdragon 855 processor, the same found in today's premium Android phones. That's going to be outdated by next year, so clearly, it's just a stop-gap. But will it simply run the Snapdragon 865 (or whatever the latest chip Qualcomm releases is called)? Or will it follow the Surface Pro X and use a custom chip? Microsoft's custom silicon would go a long way toward separating the Surface Duo from the pack, so the fact that Microsoft didn't say either way during its reveal is intriguing.

3 _____

Today's phones can pack half a terabyte of storage and 12GB of RAM at the high end, and Microsoft clearly wants the Surface Duo to be a work-first device. A base model of 8GB RAM/128GB storage like the Surface Pro X seems likely, but we want to know what the maxed-out version is. We'll take 16GB and at least 512GB, please.

4 _____

We haven't gotten a full 360-degree look at the Surface Duo yet, but from the pictures we've seen, we've yet to spot a headphone jack anywhere on the device. That's not surprising - the Surface Pro X doesn't have one, and the wireless Surface Earbuds just landed - but we'd still like to know for sure.

5 _____

According to the pics we've seen as well as Wired's report, the Surface Duo doesn't have a rear camera. Rather, the selfie camera and the main camera are one and the same. But we don't know anything about it. Will the final shipping product stick with a single camera or upgrade to a dual or triple array? Will it provide Windows Hello facial recognition? Can you take slowfies like on the iPhone? Obviously, a tablet-quality camera won't cut it here, so we're very interested to see what the Surface Duo delivers.

6 _____

2020 is shaping up to be the year of 5G, with a new integrated Qualcomm modem, greater expansion of networks, and maybe even a 5G iPhone. So, if the Surface Duo arrives without it, it could be a damper on an otherwise good phone.

7 _____

Here's the million-dollar question. With two screens to power, the Surface Duo is going to need some serious juice to keep running all day. We don't know what kind of battery is powering Microsoft's new phone. Samsung's Galaxy Fold has set the battery benchmark for folding phones at better than 12 hours of actual use, so the Duo has its work cut out for it.

8 _____

The most surprising thing about the Surface Duo - other than its very existence - is the OS it runs: Android, not Windows Mobile. But what flavor of Android will it run? It's not coming out until next year, so presumably it will have Android 11 on board, but what kind of launcher will it have? And most importantly, will updates arrive on time? With the other Surface devices, Microsoft controls the whole stack. Android support adds an extra layer that has been known to delay things.

9 _____

Microsoft is promising support for the whole Play Store app library, but we didn't see a much about games. With a clamshell design and two screens, the Surface Duo could be the device that truly takes Android gaming to the next level, with split-screen action, unique controls, and unique gameplay.

10 _____

Of course, this is what we really need to know. The Galaxy Fold starts at $1,980 and the Surface Pro X clocks in at $999. So maybe in the middle? Time will tell, but the price could be the thing that makes or breaks the Surface Duo.

From *PC World*

3. *Answer the following questions:*

- In what way is the Surface Duo similar to other smartphones?

- In what way is the Surface Duo different from other smartphones?

- Considering that the article was written in 2019, can you tell whether the Surface Duo was a success or not? Why?

4. *Explain the meaning of the highlighted words and expressions.*

5. *Discussion/Writing:*

- In your opinion, what will the smartphones look like in the future?