ANSWER KEY:

LISTENING COMPREHENSION

Listening 1

TASK 1:

1. **NG** (we can infer that sleep is active, but this function of sleep (self-repair) hasn't been mentioned)
2. **T**
3. **F** (It can, but it usually gets an input form the optic nerves).
4. **F** (misalignment was achieved by desynchronizing activity and day-night cycle, that is a non-24-hour day)
5. **T**
6. **T**
7. **T** ("how quickly can you slam on the brakes")
8. **F** (not at home but in a facility)
9. **F** (from 8.5)
10. **T**

TASK 2:

1. Klerman mentions **cellular and molecular** studies on the circadian clock and on its ability to generate 24-hour rhythms.
2. The tests checking response time performed in the first study did not include **mental calculation** or memory tests.
3. The **habitual sleep time** range of the patients in the second study was from 6 to 10 hours.
4. In the second study the subjects were scheduled to have a **4-hour nap** during the day.
5. Comparing older and younger subjects' sleeping times, Klerman says that older people's **average was lower** than younger ones'.

Listening 2

TASK 3:

1. B; I
2. E; L
3. H; O
4. C; K
5. A; G

READING COMPREHENSION

Text 1

TASK 1.

1. F
2. T
3. T
4. T
5. T
6. F
7. F
8. F
9. NG
10. T
11. NG
12. T
13. NG

Text 2

TASK 2.

1. a
2. b
3. a
4. b

TASK 3.

1.I

2. B

3.A

4.E

5.H

6.F

7.C

8.G

USE OF ENGLISH

TASK 1

1. C
2. A
3. D
4. B
5. B
6. D
7. D
8. A
9. C
10. A
11. D
12. B
13. A
14. A
15. C
16. A
17. B
18. C
19. C
20. D

TASK 2. GRAPH DESCRIPTION

Read the reports below and complete them with appropriate words. Put ONE suitable word in each space. YOU MUST NOT USE THE SAME WORD TWICE.

FIGURE 1

The figure below **1) shows/presents/indicates/illustrates/represents** the estimated numbers of consultations in Scotland for hypertension for the ten financial years 2003/04 to 2012/13.

The chart **2) shows/indicates/demonstrates** that **in the financial years 2011/12 and 2012/13 3) almost/nearly/approximately/roughly/some** two thirds of the consultations for hypertension were with practice nurses.

The number of GP contacts for hypertension **4) decreased/declined/fell/dropped/diminished/ went** ***(if "down" in 5),*** **were** ***(if "reduced" in 5)***

5) gradually/steadily/considerably/markedly/noticeably/consistently /substantially/ down ***(if "went" in 4),*** **reduced** ***(if "were in 4)*** over the years. The contribution of practice nurses

6) markedly/significantly

7) increased/rose/grew, although there was a
8) decrease/dip/fall/drop/decline/decrease in 2007/08, in line with an **9) overall 10) drop/fall/decline/decrease** in the number of consultations with health care professionals as recorded in 2007/08.

The combined number of consultations **11) stayed/remained 12) fairly/the** ***(if "same" in 13)*** **13) constant/steady/stable/same** ***(if "the" in 12)*** over the years, although there was a **14) slight 15) increase/rise/ growth** in the financial years from 2011/12 and 2012/13.

4) i 5) mogą być wpisane wymiennie

6) i 7) mogą być wpisane wymiennie

9) nie akceptujemy przymiotników typu: interesting, unusual, etc.

FIGURE 2

Number of patients consulting

The graph below **16) shows/ /indicates/demonstrates** that the number of patients who consulted **17) either** a GP or practice-employed nurse for hypertension **in the financial year 2012/13 18) increases 19) sharply/steeply/dramatically** with age, and that differences in consultation **20) rates** between males and females are small.

TASK 3:

1. hypothesized; hypothesised; hypothesise; hypothesize
2. anticonvulsant
3. particulate
4. contraindication
5. nonflammable
6. medicinal, medical
7. herniated
8. intravenous
9. nauseated; nauseous
10. allergist

SCRIPT

Listening 1:

Why do we sleep?

That's an excellent question. When I first started in the field, people thought that we slept basically to immobilize ourselves, because we don't function well at night, and the thought was that we just need to immobilize ourselves so that those creatures at night couldn't find us and attack us and eat us. But it's becoming increasingly evident by multiple **lines** of research that many things happen during sleep, sleep is necessary for multiple functions. For example, during sleep the brain processes information learnt during the day, so if you learn something and then you stay awake all night, you haven't really learnt it, your brain needs it to actually encode it appropriately so that it becomes a part of your long-term memory.

That's interesting. So, I know that your lab studies circadian rhythms, and so forth. Explain the circadian clock.

The circadian clock you can think of as a little pacemaker or clock inside your brain, it's located in the hypothalamus, just above the optic chiasm, which is where the nerve fibers go from between your eyes, so that it can get light input from the outside world. It generates its own approximately 24-hour rhythm and there have been cellular and molecular studies to show that all by itself it can generate these approximately 24-hour rhythms.

So, what are you trying to learn about this circadian clock?

I study a variety of things related to circadian clocks and their effects on either sleep or their effects on hormones and performance and alertness. So, one study that I recently did, was we looked at people getting insufficient sleep and what was the effect on performance. We put people on the equivalent of having five and a half to six hours of sleep for three weeks. However, we put them on a not 24-hour day, so that we could see the circadian effect. So, does it make a difference if you wake for thirty hours starting it basically six o'clock in the morning, or three o'clock in the afternoon or eleven o'clock at night. The results of that study showed that, first of all, you couldn't acclimate to getting insufficient sleep. So, people got worse from week one to week two, they didn't get better from week two to week three, that's not what we've seen.

We don't adjust.

We don't adjust. We can't adjust. The second thing that the data showed was that for the first few hours, like 4 to six hours after the people woke up, they did fine. Even after insufficient sleep over many days. We think this is why people think they do OK on insufficient sleep because for the first few hours after they woke up their performance was basically normal.

Ok.

As you would expect. Even without caffeine, because we didn't let them have caffeine.

Ok, how cruel!

However, after the first 4 to 6 hours, the rate of decline got worse and worse, so that people were taking up to 3 seconds to respond to a stimulus on the screen. We're not talking about mental calculation or memory test. We're talking about how quickly can you respond, how quickly can you slam on the brakes, how quickly can you do something that requires just a reaction.

Yeah.

That's how slow they were. After this insufficient sleep. And it also depended on circadian time at which it happened. If it happened at night, the circadian system was making things worse. So, that's an example of one of the aspect of research that we're doing. Another project that I've worked on recently is looking at how much sleep people get at home versus how much they're given if we bring them into the facility and give them extra opportunities for sleep and basically don't allow them out of bed. Because they wanted to get out of bed, so we took healthy younger people and older people, whose habitual sleep time range from 6 to 10 hours. We brought them into the facility and we recorded their sleep. Then, we put them on a schedule which included 12 hours of sleep at night and a 4-hour nap during the day, so 16 hours of sleep opportunity. The average amount of sleep on the first night was 12 and a half hours.

For the young and the old?

For the young, for the old that wasn't that much, but for the young it was 12 a half hours. And we're talking about people who said no, no I only need 6 hours of sleep! So, we continued this protocol for multiple days.

Did it decline at all?

It declined, exactly, perfect, it declined to a, it declined for the younger subjects to around 8 and a half to 9 hours.

Were they making up?

They were making up, but that's exactly a homeostatic response. You haven't got enough of something, you first overshoot because you have to make up. And then you come back to the level you would expect if everything were balanced. We tell people we'd like them to aim for that.

It almost seems impossible.

It seems impossible. But that's what people did fifty years ago, fifty years ago, a hundred years ago, people were getting significantly more hours of sleep than they do now. Interestingly, for older people the final level reached was slightly under 8 hours.

You mean like senior citizens?

Healthy, 65- to 85-year-old people, on no medications, with no medical illness, with no sleep disturbances. In them the average was lower than younger subjects'. We don't know whether that's because older people need less sleep or whether they can't sleep when they need to.

Listening 2:

Conversation 1 - Artificial intelligence detects skin cancer

Engineers in America have developed a computer programme that trains itself to spot skin cancers in photos from a patient's skin and, in tests, it does it as successfully as a panel of trained skin specialists. Stanford PhD student Andre Esteva is the inventor…

Andre - What we've done is to build a computer algorithm, like a computer programme that can match the performance of board certified dermatologists at identifying whether or not an image of a skin lesion is benign or malignant. And we've tested it across three really important medical diagnostic use cases, which include identifying carcinomas, including basal and squamous carcinomas from their benign counterparts as well as identifying malignant melanoma from normal ordinary moles.

Chris - And you do this by showing the computer programme images of these respective lesions?

Andre - That's correct. We use a data driven approach which, in contrast to previous computer programmes where you would tell the computer do step one, do step two, to step three, instead what we do is we feed the computer a massive amount of data. We show it images and we tell it what those images are of, for instance, malignant melanoma and it learns through a training process how to distinguish between benign and malignant all on its own.

Conversation 2 - Inter-species transplant reverses diabetes

A replacement pancreas that cures diabetic mice has been grown successfully in an animal of a different species by scientists in Japan. Tomoyuki Yamaguchi and his colleagues injected mouse stem cells into developing rat embryos. Once the rat had developed they were able to transplant the pancreas tissue into a group of diabetic mice, fixing their blood sugar levels for more than a year. Qiao Zhou, a stem cell biologist at Harvard University but who wasn't involved in the research, took Chris Smith through what the Tokyo-based team have achieved…

Zhou - What it did essentially is we managed to grow a mouse pancreas in a rat. Then we subsequently harvested this mouse pancreas from the rat and transplant it into a diabetic mouse and was able to show that this can reverse the diabetes of the recipient mouse.

Chris - Now why is that a breakthrough?

Zhou - First of all this has never been done before. This whole process, I think, points to a potential way to grow organs for future clinical use in human organ transplantation. I think that's the exciting part of it. It's a proof of concept.

Conversation 3 - Soft robotic heart pump

40 million people are affected worldwide by heart failure. This is where the heart muscle is diseased and cannot pump sufficient amounts of blood. It's very debilitating and it robs sufferers of their quality of life. At the moment, the only effective long-term solution is a transplant, but only a tiny minority of people are lucky enough to receive one. This prompted researchers to develop gadgets called ventricular assist devices that can be plumed into the heart to help it to pump, but they're not without problems. Now Ellen Roche has designed a better one, which fits around the heart like a glove,m as she explained to Chris Smith...

Ellen - This is a sleeve made of rubber with embedded balloons that can contract and beat with the heart to help the heart to pump additional blood the body. The advantage of this type of technology is

that the sleeve goes around the outside of the heart and it doesn't contact the blood like the existing ventricular assisted devices.

Chris - Why is it a problem if these devices contact blood?

Ellen - Because blood is pumped through foreign materials and in contact with foreign components it can clot, and clotting can lead to events such as stroke. So patients who have these devices are on blood thinners and this medication can itself have complications.

Conversation 4 - Do roast potatoes give you cancer?

Jasmine - Acrylamide is essentially a naturally occurring chemical so that means we don't add it to foods, it just naturally is produced. It's mainly found in foods when those goods are cooked at high temperatures and for particularly long periods of time so it's usually when foods are baked, or fried, or roasted or toasted.

If we're looking at the foods that acrylamide is found in most commonly, it's in things like crisps, chips, biscuits, bread, and cake. These foods that I've mentioned contain the building blocks for this acrylamide to form basically. There's a special reaction, it's got quite a long name, it's called the malide reaction, so basically that's a chemical reaction that occurs between sugars and amino acids that are in the foods. When these two things, the sugars and amino acids, react and also with water, that produces this reaction and it creates acrylamide. That's what give the brown colour to food and it can also change the taste of food as well, so it gives it that roasted, charred taste that you might know.

Tom - So we're thinking roast potatoes or brown toast?

Jasmine - Yes, that's right. That the malide reaction.

Tom - Why is acrylamide bad? What's the potential issue here?

Jasmine - The concern has basically come from a number of animal studies that have found that acrylamide has the potential to damage our DNA inside ourselves and, basically, DNA damage can lead to cancer. It's really important though that people remember that the same process hasn't been established in humans. So we don't have the data, we don't have the evidence to say that's there's also a link between acrylamide and cancer risk at the moment, so we need more research in that area.

Conversation 5 - Obesity blamed for 12,000 cancers a year

Kat - When you think about things that increase the risk of cancer, you probably list things like smoking, UV rays from the sun or air pollution. But in fact, like the inflation of the nation's waistlines, there's a growing number of cancers that are linked to obesity and being overweight. A new study published in The Lancet this week from scientists at London School of Hygiene and Tropical Medicine has looked at more than 5 million people in the UK and concluded that around 12,000 cancers every year can be put down to excess weight. I spoke to lead researcher Krishnan Bhaskaran to find out more.

Krishnan - So, this was a very large study. We were able to include data from over 5 million people. The way that we did that was to access anonymised GP records from across the country. What we did was we put together the height and weight measurements that have just been made in regular GP consultations as part of routine care. We also looked forward in those anonymised records to see later on whether there are any diagnoses of cancer in the same people.

Kat - What sort of timescale are we talking from those measurements being made to then a diagnosis of cancer, 5 years, 10 years, 20 years?

Krishnan - Well, it varied, but the data source that we had access to, the earliest kind of records from that were in the late '80s, early '90s. So for some people, we had about 20 years. So, on average, I think we had I think 6 to 7 years of follow up for the average person in the study.