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Academic English for Engineering and Technology Studies

Академический английский язык для магистров инженерно-технических направлений подготовки

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Разработанный комплекс заданий для аудиторной и самостоятельной работы магистров над научным и профессиональным английским языком направлен на формирование навыков академической устной и письменной речи. Представлены аутентичные англоязычные материалы по современным научным темам, практические задания по развитию навыков чтения, говорения, письма и перевода научно-технической литературы, а также упражнения на отработку углубленного лексико-грамматического материала в академическом дискурсе.

Для магистров, изучающих дисциплину «Иностранный язык (английский)» в МГТУ им. Н.Э. Баумана.

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Предисловие

Издание разработано для аудиторной, внеаудиторной и самостоятельной работы магистров, обучающихся по направлениям подготовки: 01.04.04 «Прикладная математика», 02.04.01 «Математика и компьютерные науки», 09.04.01 «Информатика и вычислительная техника», 09.04.02 «Информационные системы и технологии», 09.04.04 «Программная инженерия», 10.04.01 «Информационная безопасность», 11.04.03 «Конструирование и технология электронных средств», 11.04.04 «Электроника и наноэлектроника», 12.04.02 «Оптотехника», 12.04.04 «Биотехнические системы и технологии», 12.04.05 «Лазерная техника и лазерные технологии», 15.04.04 «Автоматизация технологических процессов и производств», 16.04.01 «Техническая физика», 24.04.01 «Ракетные комплексы и космонавтика», 24.04.02 «Системы управления движением и навигация», 27.04.04 «Управление в технических системах», 27.04.06 «Организация и управление наукоемкими производствами», 27.04.08 «Управление интеллектуальной собственностью», 28.04.02 «Наноинженерия».

Учебное пособие соответствует рабочей программе «Иностранный язык» (уровень магистратуры).

Цель данного учебного пособия — на основе аутентичного англоязычного и русскоязычного материала научно-профессиональной направленности, а также специально разработанных учебно-методических заданий обучить магистров академическому английскому языку для активного использования его при научной коммуникации в устной и письменной формах и эффективной исследовательской деятельности на иностранном языке.

Практическая значимость материала пособия предопределяется решением основной задачи дисциплины «Иностранный язык» для магистров МГТУ им. Н.Э. Баумана, состоящей в комплексном формировании у магистров иноязычной коммуникативной компетенции, направленной на активную научную и профессиональную деятельность, для успешного участия в межкультурных связях в устной и письменной формах.

Актуальность пособия определяется необходимостью обеспечения учебного процесса подготовки магистров технического профиля в рамках дисциплины «Иностранный язык» современной учебно-методической литературой, соответствующей их уровню языковой подготовки и профессиональной направленности. Данное учебное пособие является первым пособием в МГТУ им. Н.Э. Баумана, в котором содержится полный курс указанной дисциплины, построенный по модульному принципу в соответствии с рабочей программой дисциплины. Материал пособия направлен на комплексное совершенствование и дальнейшее развитие навыков и умений всех видов речевой деятельности, освоенных магистрами в рамках вузовского обучения. Это предполагает решение следующих конкретных **задач** обучения, положенных в основу данного учебного пособия:

- освоение обучающимися специализированного языкового материала, в том числе специальной лексики, терминологии, усложненных грамматических и синтаксических структур, используемых в научном дискурсе;
- совершенствование навыков чтения, анализа и перевода текстов по изучаемой в университете специальности на английском языке с целью получения, интерпретации и воспроизведения профессионально значимой информации;
- совершенствование навыков говорения и аудирования, ориентированных на коммуникацию в научно-профессиональной сфере;
- совершенствование навыков письма, в том числе при написании эссе, реферата, делового письма;
- развитие навыков поиска, анализа и отбора научно-профессиональной информации на английском языке из различных источников.

Методика проработки и освоения материала модулей. Дисциплина и, соответственно, учебное пособие построены по модульному принципу, каждый модуль представляет собой логически завершенный раздел курса. Пособие состоит из шести модулей, в которых представлены основные аспекты иноязычной коммуникативной компетентности магистра, глоссарий и приложения, включающие справочную и методическую информацию. Каждый из модулей основан на аутентичных англоязычных и русскоязычных материалах по научным и техническим темам, отрабатываемым на специально разработанных упражнениях коммуникативной направленности. В первом и втором модулях приведен материал по основным аспектам современного научного знания, эволюции научного мировоззрения и практического применения научно-технических достижений в нашей стране и за рубежом. В третьем модуле рассмотрены вопросы, связанные с общественным и личностным восприятием науки как прогрессивного фактора развития социума, государства и человека; особое внимание уделено карьере ученого. Четвертый модуль посвящен перспективам развития науки, ее инновационным движущим силам в XX и XXI веках, новым открытиям и достижениям. При изучении пятого модуля основное внимание обучающихся направлено на имплементации исследований ученых в повседневной жизни людей, их образовании и профессиональной реализации. В шестом модуле обсуждаются вопросы, связанные с академическими возможностями магистров, их умениями подготовить научный реферат на английском языке, выступить с публичной речью и защитным словом по теме исследования квалификационной работы, критически осмыслить англоязычное информационное поле своего профессионального дискурса, а также эффективно вести научную беседу.

В каждом модуле представлен основной лексико-терминологический словарь для обя-

зательного изучения, даны задания для повторения и усвоения навыков использования англоязычных грамматических структур и лексических (терминологических) единиц в академическом дискурсе, отработки навыков чтения, интерпретации и перевода научной литературы, а также совершенствования навыков устного и письменного общения в научно-профессиональных сферах. Приведены отдельные задания для самостоятельной работы, включая задания повышенной сложности, тренировочные и проверочные задания для подготовки к рубежному контролю, а также вопросы для контроля усвоения материала модулей. Учебные материалы имеют практико-ориентированный характер, обеспечивают возможность решения конкретных практических профессиональных задач, связанных с целью и планируемыми результатами обучения дисциплине.

Авторы выражают искреннюю благодарность рецензентам, коллегам и магистрам МГТУ им. Н.Э. Баумана за ценные замечания и рекомендации, которые, несомненно, помогли улучшить качество учебного пособия.

Symbols and Abbreviations

adj. – adjective

adv. – adverb

AI – Artificial Intelligence

cf. – compare

CPU – Central Processing Unit

CVR – Cockpit Voice Recorder

DNA – Deoxyribose Nucleic Acid

Dr. – doctor = scientific degree

e.g. – exempli gratia = for example

etc. – et cetera = and so on

F – false

Fig. – figure

FLAG – the Fiber optic Link Around the Globe

i.e. – id est = that is

IDC – International Data Corporation

n. – noun

T – true

v. – verb

VR – virtual reality

* – упражнение для углубленного освоения материала модулей

Введение

В связи с процессами глобализации усиливаются интеграционные тенденции в науке, культуре и образовании, что повышает роль иностранного языка как посредника всех интеграционных процессов. В этих условиях цели и задачи изучения иностранного языка сближаются с целями и задачами профессиональной подготовки и становления магистра как ученого, т. е. язык постигается одновременно и вместе с наукой как форма, в которую облекается научное знание в соответствии с условиями научного общения. Курс изучения иностранного языка в рамках дисциплины «Иностранный язык» носит таким образом профессионально-ориентированный и коммуникативный характер.

Цели изучения дисциплины. **Планируемые результаты обучения.** После изучения дисциплины магистры овладеют:

- лексическими, терминологическими, грамматическими, стилистическими англоязычными языковыми средствами, позволяющими получать, интерпретировать и использовать информацию в области научного и профессионального устного и письменного общения на английском языке;
- умениями читать, переводить и анализировать аутентичные тексты научной и профессиональной направленности;
- навыками монологического высказывания, а также участия в дискуссиях на научные и профессиональные темы, в частности связанные с научной работой магистра;
- навыками составления письменных текстов на английском языке и оформления их в соответствии с правилами и жанрово-стилистическими особенностями, принятыми в академических англоязычных дискурсах;
- основными навыками устной публичной речи, подготовки и выступления с презентацией на английском языке по теме своего научного исследования.

Освоение дисциплины «Иностранный язык» направлено на формирование умений и навыков всех видов речевой деятельности, а также на углубление лексико-грамматических знаний магистров, а именно:

— *лексика* — к концу практического курса обучения лексический запас магистра должен

составлять не менее 5500 лексических единиц с учетом вузовского минимума, включая 500 терминов по изучаемой специальности магистра. Рекомендуется составление терминологического словаря с учетом специфики научной сферы деятельности магистра;

грамматика — магистр должен знать и практически владеть грамматическим минимумом по иностранному языку, необходимым и достаточным для осуществления устной и письменной коммуникации в научно-профессиональных сферах;

чтение — магистр должен уметь читать, переводить и критически осмысливать оригинальную научную литературу по своей специальности с последующей фиксацией полученной информации в виде плана, реферата, сообщения и пр. Предполагается освоение магистрами следующих видов чтения: изучающее, ознакомительное, просмотровое, поисковое, реферативное, аналитическое;

говорение — магистр должен владеть подготовленной и неподготовленной монологической и диалогической речью, в частности в рамках научно-профессиональной тематики магистра. Предполагается обсуждение профессиональных тем, в том числе в ходе публичных выступлений, а также умение общаться на английском языке в условиях естественной коммуникации;

письмо — магистр должен уметь фиксировать полученную из научных профессиональных текстов информацию в форме плана, письменного сообщения, реферата, а также составлять собственные тексты в виде научного эссе и делового письма;

аудирование — в ходе практической работы рекомендуется работа по коррекции аудитивных и произносительных навыков магистра;

социокультурный аспект — развитие научной мысли в России и за рубежом, ознакомление с великими учеными и их открытиями.

Планируемые результаты обучения сформулированы в программе дисциплины «Иностранный язык», их необходимо постоянно иметь в виду при изучении курса, особенно с учетом того, что достижение каждого результата будет оценено при текущем или промежуточном контроле.

Module 1

WHAT IS SCIENCE?

Academic Word List: analyze, approach, assess, assume, authority, available, benefit, concept, consist, constitute, context, contract, create, define, derive, distribute, economy, environment, establish, estimate, evident, export, factor, finance, formula, function, income, identify, indicate, individual, interpret, involve, issue, labor, legal, legislate, major, method, occur, percentage, period, policy, principle, proceed, process, require, research, respond, section, significant, similar, source, specific, structure, theory, vary.

GRAMMAR REVISION

Preliminary Diagnostic Test

1. ***Choose the correct option to complete the passage.***

My current (1) *researches are* / *research is* concerned with blind signal processing, (2) *that* / *which* is, manipulating or extracting (3) *information* / *informations* from (4) *any* / *some* kind of signal without (5) *to know* / *knowing* the system, or the physical process, through (6) *that* / *which* the signal has passed before (7) *to be* / *being* sensed. In mathematical terms, this is a very difficult problem, (8) *that* / *which* can be solved by (9) *to use* / *using* just two basic tools: diversity and statistics. In the last few years, I have been treating "frequency" diversity. My main objective is (10) *extracting* / *to extract* only those maps (11) *that* / *which* are related to astrophysical radiations.

2. ***Choose the correct options to complete the passages.***

1. I (1) *hear* / *am hearing* / *having heard* that you (2) *have* / *have had* / *have been had* problems downloading the files. Sorry about this. I (3) *speak* / *will speak* / *have spoken* to the Systems Manager and she (4) *promises* / *have promised* / *promised* to get back to you by lunchtime. She also (5) *asked* / *has asked* me if you could send her any new files.

2. Please (6) *find* / *will find* attached a draft copy of the proposal. As you (7) *see* / *will see* there are a few question marks, so (8) *feel* / *will feel* free to make any changes. I (9) *also forward* / *have also forwarded* you Jean's comments. I (10) *ring* / *will ring* / *am ringing* you later in the week to see how you (11) *get* / *are getting on*.

3. ***Decide which sentences are incorrect and correct them.***

1. Agnes has had terrible headaches for a while now and she's finally gone to see a doctor about it. 2.

Recently I've listened to Highway 61 Revisited a lot. What have you listened to lately? 3. Farmers have got their produce ready all year round for Thanksgiving celebrations when Americans all over the world sit down for a family meal. 4. Have you been paying attention to your lectures? I hope so, because next week's test is all about them. 5. For the past three years, conservation groups are pushing for a ban on overfishing in the North Sea.

4. *Complete the sentences using the correct form of the verbs in brackets.*

1. I 'm so angry with Alice. While I _____, she _____ a party in her room next door. (*study* / *have*) 2. Piotr _____ the room when he _____ that he didn't have his key. (*leave* / *remembered*) 3. In 1969, a Soviet satellite _____ the Moon as the American astronauts _____ . (*orbit* / *land*) 4. Magali _____ even _____ the wall; when she _____ her car, she _____ the road at all. (*not see* / *crash* / *not watch*) 5. I _____ later that my Internet connection wasn't working, but until then I _____ for her email. (*realize* / *wait*)

5. *Complete the passage using the correct form of the verbs in brackets.*

It is said that Galileo (1) _____ (*drop*) objects of the same material, but of different weights, from the Tower of Pisa to prove that the time they took to fall did not depend on their weight. This was contrary to what Aristotle (2) _____ (*teach*): that heavy objects fall faster than lighter ones. Galileo also (3) _____ (*think*) that objects keep their speed unless a force — often friction — slowed them down. But Galileo's discoveries (4) _____ (*not be*) entirely original. Nicole Oresme in the 14th century (5) _____ already _____ (*think*) about the mathematical law for acceleration; Ibn al-Haytham (6) _____ (*propose*) ideas along the same lines centuries earlier and Mo Tzu (7) _____ (*discover*) it centuries before either of them. However, Galileo was the first person who (8) _____ (*express*) these ideas mathematically and checked them with experiments.

6. *Complete the passage using the correct form of the verbs in brackets.*

Software testing Long before a computer program (1) _____ (*ship*) to the customer, software testing (2) _____ (*perform*) by independent testers. Testing can be done on the following levels: Unit testing (3) _____ (*test*) individual pieces of the software. Each basic component of the software (4) _____ (*test*) to verify that the design (5) _____ (*implement*) correctly. In the second kind of test, integration testing, progressively larger groups of tested software units (6) _____ (*integrate*) and tested until the software (7) _____ (*work*) as a system. Then system testing (8) _____ (*check*) the whole system to see that it works. Before shipping the final version, alpha and beta testing (9) _____ (*often do*). Alpha testing is testing by potential users / customers. Beta testing comes after alpha testing. Versions of the software, known as beta versions, (10) _____

(*release*) to a limited audience to make sure the product has few faults or bugs.

7. *Complete the gaps with the appropriate words or phrases from the list.*

probably, not definitely, may be, probably go, might not, might have, might, could make, might wait

1. Selling home-made soup at the college fair _____ a lot of money for charity. 2. I've almost decided, I'll _____ to Greece for my next holiday. 3. Laptops are getting cheaper all the time, so _____ until next year before I buy one. 4. Revising before taking an examination is _____ a good idea. 5. I haven't made up my mind. I _____ go to the party, but then again I _____. 6. Eating raw chilies is _____ a sensible thing to do, unless you are used to them. 7. I'm not sure if any food will be provided, so I _____ something to eat before I go. 8. There _____ something wrong with her car, perhaps that's why she's late.

8. *Complete the passage using the correct comparative form of the words in brackets.*

The chart shows how much people have to pay for things they buy every day in three cities: New York, Tokyo and Sydney. A ride on the bus or subway is (1) _____ (*cheap*) in Sydney than in New York, but in Tokyo it is (2) _____ (*expensive*) of all three. Buying a newspaper in Sydney, however, is (3) _____ (*much / costly*) than in Tokyo, which is (4) _____ (*inexpensive*) of the three cities. The cost of a cup of coffee is (5) _____ (*high*) in Sydney than in New York, where it is at over £2. In Tokyo, it is (6) _____ (*cheaply*), at around £1.50 per cup. For a hamburger meal, New York is (7) _____ (dear), and Sydney is (8) _____ (*expensive*). Overall, it seems that prices in Sydney are (9) _____ (*low*) than in New York, unless you buy newspapers. If you want to save money, it's a (10) _____ (*good*) place to live.

9. *Complete the sentences using the correct form of the verbs in brackets.*

1. If governments _____ (*spend*) less money on developing weapons and more on health and education, the world _____ (*be*) a better place. 2. In an ideal world, everybody _____ (*have*) enough to eat. 3. If I _____ (*rule*) the country, I _____ (*build*) houses for homeless people. 4. There _____ (*be*) a lot more happiness if there _____ (*be*) no more wars. 5. Which people _____ you _____ (*help*) if you _____ (*win*) £1,000,000? 6. I _____ (*not touch*) that red button if I _____ (*be*) you – it looks dangerous. 7. If teachers and nurses _____ (*earn)* a higher salary, they _____ (*have*) more respect. 8. If leaders of some countries _____ (*value*) people more and money less, fewer people _____ (*starve*). 9. The tutor _____ (*be*) angry if you _____ (*arrive*) late again. 10. If I _____ (*see*) Joe tomorrow, I _____ (*give*) him the message.

10. ***Correct the mistakes in the sentences.***

1. If you would meet Peter, you would like him. 2. If I have a lot of money, I'd buy a Ferrari. 3. If he had time, John will go to the gym more often. 4. I wouldn't touch that if I am you. 5. Would you still gone to Sydney if you had known it was so expensive? 6. Wouldn't you sorry if you failed the exam? 7. If I hadn't been so clumsy, I wouldn't break your DVD player. 8. What you will do if you missed your train?

11. ***Choose the correct option.***

1. The Minister of Health *denied* / *refused* that there was a crisis. 2. Carmen *said me* / *told me* to be quiet. 3. Rory *persuaded me* / *insisted me* to stay for dinner. 4. The tutor *advised me* / *suggested me* to work this weekend. 5. She *explained me* / *warned me* not to leave the light on all night. 6. Tony and Rachel *announced* / *reported* that they were going to get married.

12. ***Rewrite the sentences using the words in brackets.***

Example*: We want to see a film. It starts at seven* (that). *The film that we want to see starts at seven.*

1. Steve's car was stolen. He went to the police. (*whose*) 2. A friend met me at the station. He carried my bags. (*who*) 3. Rachel cooked the food. It was delicious. (*that*) 4. A friend is staying with Peter. He comes from Paris. (*who*) 5. I found a man's wallet. He gave me £10. (*whose*)

Nouns. Plurals, Countable Versus Uncountable

1. ***Choose the correct option: noun-verb agreement.***

1. Of these papers, less than a half *deals* / *deal* with this issue. 2. A number of authors *has* / *have* claimed that $x = y$. 3. The number of publications per year *is* / *are* reported in Table 3. 4. The majority of articles only *covers* / *cover* marginal issues. 5. This group of tables *contains* / *contain* all the relevant results. 6. Ten kilos *is* / *are* enough to ensure a good performance. 7. Several thousand dollars *is* / *are* required. 8. The police *is* / *are* present in heavy numbers. 9. Fifty per cent *is* / *are* certainly a good rate. 10. A variety of articles *has* / *have* investigated this business sector. 11. None of the instruments *work* / *works*. 12. There *is* / *are* a bathroom and a bedroom.

2*. ***The following sentences contain mistakes regarding uncountable nouns that have mistakenly been used as if they were countable. Identify the mistakes and correct them.***

1. Such feedbacks are vital when analyzing the queries. 2. The time depends on the efficiency of each equipment and the number of equipments. 3. Several software packages were developed with many

attentions to eradicating all bugs. However, in several situations, the results obtained from these softwares are still erroneous. 4. Special hardwares are required in some situations. 5. Many informations on the structure and function are being gathered. 6. This causes many traffics on the network. 7. There are few knowledges about the best way to do this. 8. These researches have achieved many progresses in this fields. 9. Nuclear power causes a pollution for people and the environment. 10. Solar power do not cause damages to the environment. 11. The students are doing a large number of researches. 12. The Careers Service at the university gives helps to both British and international students. 13. The government should give useful advices to young unemployed people. 14. The children's behaviors is unacceptable. 15. Some very expensive equipments were used in the experiment.

Nouns. Genitive: The Possessive Form of Nouns

3. ***Authors, theories, companies, products. Choose the correct form. If both are correct, underline the both forms.***

1. *Petrov* / *Petrov*'*s* paper was the first to … 2. *Petrov*'*s et al*. / *Petrov et al*'*s* paper was the first to … 3. *Jones* / *Jones*'*s* / *Jones*' most recent investigation into … 4. We have addressed all the *referee* / *referee*'*s* / *referees*' requests. 5. *A Boolean* / *Boolean*'*s* operator may refer to one of the following … 6. In our work, *Fourier* / *Fourier*'*s* analysis was used to derive the … 7. They used a *Turing* / *Turing*'*s* machine simulation to obtain their result. 8. *Turing* / *Turing*'*s* / *The Turing*'*s* original thesis was that … He then went on to reformulate this thesis by … 9. *Beer* / *The Beer*'*s* / *Beer*'*s* findings, together with those of Johann Heinrich Lambert, make up *Beer-Lambert* / *the Beer-Lambert* / *Beer-Lambert*'*s* law. 10. *Apple* / *Apple*'*s* / *The Apple*'*s* initial decision to make iPods solely compatible with iTunes caused … 11. *IBM*'*s* / *IBM* first computer. 12. *Burger and Wilmar*'*s* / *Burger*'*s and Wilmar*'*s* document. 13. These are the results of ten *year*'*s / years*' / *year* studying, which was divided into two *five-year* / *five-years* / *five years*' periods. 14. A *mile*'*s* / *mile* walk. 15. I'm taking six *month* / *month's* sabbatical next year.

Nouns. Indefinite Article (*a* / *an*), Definite Article (*the*), and Zero Article

4. ***Fill in the gaps choosing the correct option: a, an, one, the, Ø (nothing).***

1. Hydrogen is produced at _____ high temperature. 2. This gives _____ really useful information. 3. We have made _____ progress. 4. We used _____ particular software in our calculations. 5. We are doing _____ research into rats. 6. _____ analysis of the results shows that … 7. This is _____ evidence of how effective the system is. 8. There is _____ complex hierarchy in the company. 9. I went to _____ university in Russia. 10. It has _____ unique value. 11. It increased by _____ order of magnitude. 12. We'll do it _____ day next week. 13. We

used _____ after the other. 14. This is just _____ way to achieve such performance. 15. All these lamps need just _____ bulb. For this lamp, we need _____ 80-watt bulb and for this lamp _____ 60-watt bulb. 16. There were _____ hundred people not two hundred. 17. This is _____ European Union directive. 18. _____ researchers have a very privileged position as they are paid to do what they like doing. 19. _____ researchers at Manchester University are studying ways to improve English as a language of international business communication. 20. _____ researchers who are studying the way non-native speakers use English have provided the most interesting results so far.

READING AND SPEAKING

1. WHAT IS CONTEMPORARY SCIENCE?

5. ***Think and talk about the experiences of contemporary science that have interested, excited or concerned you, either professionally or in your personal life. The following famous scientists' quotations may help you. Discuss them in the group. Express your own opinion.***

1. "Science is a way of thinking much more than it is a body of knowledge." (*Carl Sagan*) 2. "The most beautiful experience we can have is mysterious. It is the fundamental emotion that stands at the cradle of true art and true science." (*Albert Einstein*) 3. "Millions saw the apple fall, Newton was the only one who asked why?" (*Bernard M. Baruch*) 4. "Your assumptions are your windows on the world. Scrub them off every once in a while, or the light won't come in." (*Isaac Asimov*) 5. "If you thought that science was certain — well, that is just an error on your part." (*Richard P. Feynman*) 6. "I would rather have questions that can't be answered than answers that can't be questioned." (*Richard Feynman*) 7. "A straight line is not the shortest distance between two points." (*Madeleine L'Engle*) 8. "When my information changes, I alter my conclusions. What do you do, sir?" (*John Maynard Keynes*) 9. "Science is the great antidote to the poison of enthusiasm and superstition." (*Adam Smith*) 10. Your favorite quotation / expression about science.

6. ***Read the text and find answers to the questions below it.***

A Review of Contemporary Science

Contemporary science is typically subdivided into the natural sciences, which study the material universe; the social sciences, which study people and societies; and the formal sciences, which study logic and mathematics. The formal sciences are often excluded as they do not depend on empirical

observations. Disciplines which use science, like engineering and medicine, may also be considered to be applied sciences.

From classical antiquity through the 19th century, science as a type of knowledge was more closely linked to philosophy than it is now, and in the Western world the term *natural philosophy* once encompassed fields of study that are today associated with science, such as astronomy, medicine, and physics. However, during the Islamic Golden Age foundations for the scientific method were laid by Ibn al-Haytham in his Book of Optics. While the classification of the material world by the ancient Indians and Greeks into air, earth, fire and water was more philosophical, medieval Middle Easterns used practical and experimental observation to classify materials.

In the 17th and 18th centuries, scientists increasingly sought to formulate knowledge in terms of physical laws. Over the course of the 19th century, the word *science* became increasingly associated with the scientific method itself as a disciplined way to study the natural world. It was during this time that scientific disciplines such as biology, chemistry, and physics reached their modern shapes. That same time period also included the origin of the terms *scientist* and *scientific community*, the founding of scientific institutions, and the increasing significance of their interactions with society and other aspects of culture.

The societal impacts of scientific and technological advances – whether desirable or undesirable – have been one of the primary foci of contemporary policy research. Economic and sociopolitical implications of science and technology development associated with global climate change and sustainable energy generation, big data and information and communication infrastructure and network, food security and bioengineering, and nano-scale research and applications, to name a few, have been frequently discussed by scholars, practitioners, the media, and ordinary citizens, and the related government policies have naturally been reflective of such discussion.

Advances in scientific understanding and the development of new technologies are considered fundamental to maintain competitive market advantages and continued economic growth and, in this context, are considered beneficial to society. Broadly speaking, government policies in this realm are concerned about promoting the development, production, and diffusion of innovative science and technology to achieve such ends. The majority of innovation research seeks to model innovation processes, explore the mechanisms of innovation, and identify the conditions that facilitate it. Within the last three years, researchers have increasingly applied a multiscalar lens to understand the diffusion of policies and knowledge assumed necessary to foster innovation. Subtopics within this area of research also focus on society's evaluation and adoption of new technologies and their overall impacts.

Questions

1. Why are the formal sciences often excluded from the system of science?
2. Why was science more closely linked to philosophy than it is now?

3. How did science develop in the 17th and 18th centuries?

4. What are the primary foci of contemporary policy research? Do you agree with the author?

5. What are government policies concerned about nowadays?

6. Do you agree with the explanation of *contemporary science* given in the text?

7. Comment on the expression 'Science is a global human endeavor'.

7*. *Explain the following word-combinations. Give their Russian equivalents.*

Natural sciences, the natural sciences, the social sciences, the formal sciences, applied sciences, fields of study, the scientific method, practical and experimental observation, scientific disciplines, scientific community, scientific and technological advances, global climate change, nano-scale research, scientific understanding, innovative science and technology, a multiscalar lens.

8. *Fill in the gaps with the appropriate words from the list.*

contract, legal, period, available, similar, analysis, indicates, research, factor, economy

1. He did an _____ of the way children learn language for his Master's thesis. 2. He was arrested for drunk driving because he had drunk more than the _____ limit of alcohol. 3. The culture of the United States is quite _____ to that of Canada. 4. The Canadian _____ is largely based on natural resources. 5. Environmental pollution seems to be an important _____ in the increase in cancers all over the world. 6.The apartment will be _____ on June first. 7. The young popstar became famous while still in high school after winning a _____ with a major record label. 8. Your continued lateness for class _____ to me that you are not really a very serious student. 9. Living in Berlin during the _____ when the Berlin Wall was torn down was an unforgettable experience. 10. Some _____ into second language learning suggests that oral fluency may increase with moderate amounts of alcohol.

2. SCIENCE AS KNOWLEDGE

9. *Read the text. Choose the correct heading for each section (A–F) from the list of headings below (i–viii). Discuss your answers in the group.*

List of Headings

i. Courses that require a high level of commitment
ii. A course title with two meanings
iii. The equal importance of two key issues
iv. Applying a theory in an unexpected context
v. The financial benefits of studying

vi. A surprising course title
vii. Different names for different outcomes
viii. The possibility of attracting the wrong kind of student

What is the Purpose of Gaining Knowledge?

A. 'I would found an institution where any person can find instruction in any subject' That was the founder's motto for Cornell University, and it seems an apt characterization of the different university, also in the USA, where I currently teach philosophy. A student can prepare for a career in resort management, engineering, interior design, accounting, music, law enforcement, you name it. But what would the founders of these two institutions have thought of a course called 'Arson for Profit'? I think you not: we have it on the books. Any undergraduates who have met the academic requirements can sign up for the course in our program in 'fire science'.

B. Naturally, the course is intended for prospective arson investigators, who can learn all the tricks of the trade for detecting whether a fire was deliberately set, discovering who did it, and establishing a chain of evidence for effective prosecution in a court of law. But wouldn't this also be the perfect course for prospective arsonists to sign up for? My point is not to criticize academic programs in fire science: they are highly welcome as part of the increasing professionalization of this and many other occupations. However, it's not unknown for a firefighter to torch a building. This example suggests how dishonest and illegal behavior, with the help of higher education, can creep into every aspect of public and business life.

C. I realized this anew when I was invited to speak before a class in marketing, which is another of our degree programs. The regular instructor is a colleague who appreciates the kind of ethical perspective I can bring as a philosopher. There are endless ways I could have approached this assignment, but I took my cue from the title of the course: 'Principles of Marketing'. It made me think to ask the students, 'Is marketing principled?' After all, a subject matter can have principles in the sense of being codified, having rules, as with football or chess, without being principled in the sense of being ethical. Many of the students immediately assumed that the answer to my question about marketing principles was obvious: no. Just look at the ways in which everything under the sun has been marketed; obviously, it need not be done in a principled (= ethical) fashion.

D. Is that obvious? I made the suggestion, which may sound downright crazy in light of the evidence, that perhaps marketing is by definition principled. My inspiration for this judgement is the philosopher Immanuel Kant, who argued that any body of knowledge consists of an end (or purpose) and a means.

E. Let us apply both the terms 'means' and 'end' to marketing. The students have signed up for a course in order to learn how to market effectively. But to what end? There seem to be two main attitudes toward that question. One is that the answer is obvious: the purpose of marketing is to sell

things and to make money. The other attitude is that the purpose of marketing is irrelevant: Each person comes to the program and course with his or her own plans, and these need not even concern the acquisition of marketing expertise as such. My proposal, which I believe would also be Kant's, is that neither of these attitudes captures the significance of the end to the means for marketing. A field of knowledge or a professional endeavor is defined by both the means and the end; hence both deserve scrutiny. Students need to study both how to achieve X, and also what X is.

F. It is at this point that 'Arson for Profit' becomes supremely relevant. That course is presumably all about means: how to detect and prosecute criminal activity. It is therefore assumed that the end is good in an ethical sense. When I ask fire science students to articulate the end, or purpose, of their field, they eventually generalize to something like, 'The safety and welfare of society,' which seems right. As we have seen, someone could use the very same knowledge of means to achieve a much less noble end, such as personal profit via destructive, dangerous, reckless activity. But we would not call that firefighting. We have a separate word for it: arson. Similarly, if you employed the 'principles of marketing' in an unprincipled way, you would not be doing marketing. We have another term for it: fraud. Kant gives the example of a doctor and a poisoner, who use the identical knowledge to achieve their divergent ends. We would say that one is practicing medicine, the other, murder.

10. ***Do the following statements agree with the views of the text writer? There are three possible options. Choose one option. Discuss your opinions with your groupmates.***

YES — if the statement agrees with the views of the writer;
NO — if the statement contradicts the views of the writer;
NOT GIVEN — if it is impossible to say what the writer thinks about this.

1. It is difficult to attract students onto courses that do not focus on a career.
2. The 'Arson for Profit' course would be useful for people intending to set fire to buildings.
3. Fire science courses are too academic to help people to be good at the job of firefighting.
4. The writer's fire science students provided a detailed definition of the purpose of their studies.

11. ***Table 1.1. contains word families for some academic words from the list above. Complete the table. An 'X' indicates that there is no form or that the form is not common. Sometimes more than one form may be possible. If you are unsure about a form, check Appendix 4. The first one is done for you.***

Table 1.1. Word Families for Module 1 Academic Word List

Verb	*Noun*	*Adjective*	*Adverb*	*Participle I, II*
analyse	analysis (analyses) analyser(s) analyst(s)	analytic analytical	analytically	analysing analysed

distribute	……	……	……	……
……	……	significant	……	……
require	……	……	……	……
……	……	authoritative	……	……
X	availability(-ties)	……	……	X
……	……	similar	……	……
……	……	conceptual	……	……
……	……	……	……	consisting consisted
constitute	……	……	……	……
……	contractor(s) contract(s)	……	……	……
……	……	……	creatively	……
……	……	definable	……	(un)defined (re)defined
……	derivation(s) derivative(s)	……	……	……
establish	……	X	X	……
indicate	……	……	……	……
……	formula formulae formulas	X	X	……
……	……	interpretative	……	……
……	……	……	……	involving uninvolved
……	……	……	methodologically	……
……	……	procedural	……	……
……	researcher researchers research	X	X	……
……	……	……	legally illegally	……
……	specificity	……	……	……
structure restructure	……	……	……	……
X	theory, theories theorist(s)	……	……	X

12. ***Fill in the gaps with the appropriate words from the list.***

periodically, indications, analyzed, availability, economical, research, contractually, illegality, factor, similarity, varies, context, authority, labor, export, requires income, significant, percentage, distribute

1. _____ of water is vital to all plant and animal life. 2. We need to find a more _____ way to manufacture our products because our profit margin is too low. 3. We have noticed a _____ improvement in Teddy's attitude since you had a talk with him. 4. Warmer than average weather was the deciding _____ in our decision to postpone our ski trip. 5. Interest in the planet Mars has greatly increased since _____ of water raised the possibility that life in some form may have evolved there. 6. I think that the _____ of students that have to repeat a level in this program is

usually about 25% or less. 7. Music downloaders are questioning the _____ of file sharing, claiming the law is unclear on the matter. 8. The amount of rain we receive _____ from year to year of course, but this year has been very dry. 9. Meetings will be held _____ for the members of the project to discuss their progress. 10. Jane Goodall's _____ into chimpanzees has greatly increased our knowledge of these animals. 11. Management is meeting with _____ to begin discussions on a new contract. 12. We are _____ obliged to deal with this firm. 13. The DNA of chimpanzees shows a remarkable _____ to that of humans. 14. He is a well-known _____ on the language used by bees to communicate the location of food. 15. At the end of a research project, the researcher is normally faced with lots of observations which need to be _____. 16. Could you please _____ the answer sheets while I hand out the tests? 17. Vocabulary is generally easier to understand if you look at it in _____. 18. In the future, Canada will be under great pressure to _____ fresh water to the United States. 19. This airline seat-sale _____ you to book your ticket at least a month in advance. 20. It is generally quite difficult to raise a family on a single _____ in Canada today, so very often both parents work full-time.

3. SCIENCE AND TECHNOLOGY AS RESOURCE OF SOCIETY RENOVATION

13. ***Read the text and find out the impacts of science and technology on modern society. Do you agree with them? What other impacts can you name?***

Impacts of Science and Technology on Society

Imagine you were born some 300 years ago, in the year 1700. Although this is very recent in terms of the billions of years of the existence of planet Earth, you would still have been living in a remarkably different world. You would never have been to a shopping mall. You would never have encountered the world of cars, railways, airplanes, telephones, cameras, computers, and TVs. And more than this, the idea of voting for your government, going to college, choosing your religion, or even choosing your identity would all have been rare. Welcome to the modern world!

Life has certainly changed in 300 years, and sociology was born out of a concern with this rapidly changing character of the modern, industrial world: with where we have come from and where we are heading. For sociologists, the term society means "all the people who interact in a defined space and share culture." In this sense, both a continent like Europe and specific individual countries such as Norway or Japan may be seen as societies. Even humans living thousands of years ago were members of early human societies. Evidence of this comes from the discovery of the Iceman. Examining

the Iceman's clothes, scientists were astonished at how advanced this ‘caveman’s’ society was. The Iceman's hair was neatly cut, and his body had numerous tattoos that probably symbolized his standing in the community. He wore a skillfully sewn leather coat over which a grass cape provided even greater protection from the weather. His shoes, also made of leather, were stuffed with grass for comfort and warmth. He carried with him an axe, a wood-handled knife, and a bow that shot feathered arrows with stone points. A primitive backpack held additional tools and personal items, including natural medicines made from plants. It is estimated that he died some 5,300 years ago-before a great empire existed in Egypt, before the flowering of culture in ancient Greece, and before any society in Europe built a single city. As people who take for granted rapid transportation and instant global communication, we can look on this ancestor as a connection to our distant past.

Sociologists have identified great differences among societies that have flourished and declined throughout human history. They have observed how societies change over centuries as the people in them gain greater ability to manipulate their natural environment. Societies with basic technology can support only a small number of people who enjoy few choices about how to live. Technologically complex societies-while not necessarily ‘better’ in any absolute sense-develop large populations; people in these societies are likely to lead diverse, highly specialized lives.

The greater the amount of technological skill and knowledge a society has, the faster the rate at which the society changes. Technologically simple societies, then, change very slowly. Take, for example, some of the clothing worn by the Austrian Iceman. It differs only slightly from clothes used by shepherds in the same area of the world early in the twentieth century. In contrast to simpler societies, industrial, technologically advanced societies change so quickly that people witness remarkable transformations within their lifetimes. Again, consider some familiar elements of contemporary culture that would probably puzzle, delight, and possibly frighten people who lived just a few generations ago: fast food, faxes, mobile phones, computer games, artificial hearts, fiber optics, test-tube babies, and many, many others. Indeed, it is a strange modern world we live in-even when compared with the world of the recent past.

Consider also the countless consequences of technological change. When our ancestors first harnessed the power of the wind by using a sail, they set the stage for the invention of kites, sailing ships, windmills, and, eventually, airplanes. We are only now beginning to see how our modern lives are being changed by recent technologies like atomic energy or the computer.

Sociologists divide societies into five types according to their technologies: (1) hunting and gathering societies, (2) horticultural and pastoral societies, (3) agrarian societies, (4) industrial societies, and (5) post-industrial societies. Hunting and gathering societies use simple technologies to gather food from nature, such as hunting animals and picking berries. Horticultural and pastoral societies grow their own plants and raise animals to eat. Agrarian societies-which first appeared around the

time of the Iceman-use technologies such as animal-drawn plows to farm on a larger scale. Agrarian societies were also the first to develop such technological innovations as irrigation, the wheel, writing, numbers, and expanded uses for metals.

Industrial societies use technology that powers sophisticated machinery with advanced sources of energy. Before the industrial era, the major source of energy was the muscle power of humans and animals. In industrial societies, people learn mechanical skills so that they can operate the machinery needed to produce material goods. These societies transformed themselves more in a century than previous societies had in thousands of years. Post-industrial societies-like the ones many of us live in today-have developed technologies that support an information-based economy. People in these societies create, process, store, and apply information through the use of computers, fax machines, satellites, and other forms of communication technology.

Technology has a big impact on a society, but in itself it is neutral. People are the ones who decide how to use technology and whether it is used for good or bad purposes. Armed with the capacity to reshape the world, human societies must understand both the social benefits and problems caused by the desire for technological change. Furthermore, it is important to note that the five types of societies described above do not evolve from one type to another in an automatic process. In fact, in modern times, all of these societies may be said to coexist.

14. ***Answer the following questions to the text from exercise 13. Your answers should be based on the reading and your personal experience.***

1. What do sociologists mean by the term *society*? Do you agree with this definition? Why *yes* or why *not*?
2. Describe three technological advances in recent years that have changed the society you live in.
3. How are technologically advanced societies different from societies with simpler technologies? Give an example of how they differ.

15. ***Read the following statements and indicate whether you agree or disagree with them. Then discuss your opinions with a partner; be sure to provide support for your opinions.***

1. The globalization of contemporary culture will eventually destroy the uniqueness of diverse societies.
2. It is no longer realistic for the members of one generation to expect their standard of living to be significantly better than that of the previous generation.
3. All governments should cut back on military spending. Furthermore, the money saved should be used to support the neediest members of society.
4. Governments should charge higher taxes on luxury items so that necessities such as heating oil and

clothing can be sold tax free.

5. Newspapers unfairly manipulate public opinion by printing one-sided news stories.
6. Young people today are likely to encounter more difficulties in their lives than their parents did a generation ago.

16. ***Read the text and find information about the origin of the concept of number.***

Numeration

One of the first great intellectual feats of a young child is learning how to talk, closely followed by learning how to count. From earliest childhood, we are so bound up with our system of numeration that it is a feat of imagination to consider the problems faced by early humans who had not yet developed this facility. Careful consideration of our system of numeration leads to the conviction that, rather than being a facility that comes naturally to a person, it is one of the great and remarkable achievements of the human race.

It is impossible to learn the sequence of events that led to our developing the concept of number. Even the earliest of tribes had a system of numeration that, if not advanced, was sufficient for the tasks that they had to perform. Our ancestors had little use for actual numbers; instead, their considerations would have been more of the kind Is this enough? rather than How many? when they were engaged in food gathering, for example. However, when early humans first began to reflect on the nature of things around them, they discovered that they needed an idea of number simply to keep their thoughts in order. As they began to settle, grow plants and herd animals, the need for a sophisticated number system became paramount. It will never be known how and when this numeration ability developed, but it is certain that numeration was well developed by the time humans had formed even semi-permanent settlements.

Evidence of early stages of arithmetic and numeration can be readily found. The indigenous peoples of Tasmania were only able to count one, two, many; those of South Africa counted one, two, two and one, two twos, two twos and one, and so on. But in real situations the number and words are often accompanied by gestures to help resolve any confusion. For example, when using the one, two, or many types of system, the word *many* would mean, ‘Look at my hands and see how many fingers I am showing you.’ This basic approach is limited in the range of numbers that it can express, but this range will generally suffice when dealing with the simpler aspects of human existence.

The lack of ability of some cultures to deal with large numbers is not really surprising. European languages, when traced back to their earlier version, are very poor in number words and expressions. The ancient Gothic word for *ten*, *tachund*, is used to express the number 100 as *tachund tachund*. By the seventh century, the word *teon* had become interchangeable with the *tachund* or *hund* of the Anglo-Saxon language, and so 100 was denoted as *hund teontig*, or ten times ten. The average person in

the seventh century in Europe was not as familiar with numbers as we are today. In fact, to qualify as a witness in a court law a man had to be able to count to nine!

Perhaps the most fundamental step in developing a sense of number is not the ability to count, but rather to see that a number is really an abstract idea instead of a simple attachment to a group of particular objects. It must have been within the grasp of the earliest humans to conceive that four birds are distinct from two birds; however, it is not an elementary step to associate the number *4*, as connected with four birds, to the number *4*, as connected with four rocks. Associating a number as one of the qualities of a specific object is a great hindrance to the development of a true number sense. When the number 4 can be registered in the mind as a specific word, independent of the object being referenced, the individual is ready to take the first step toward the development of a notational system for numbers and, from there, to arithmetic.

Traces of the very first stages in the development of numeration can be seen in several living languages today. The numeration system of the Tsimshian language in British Columbia contains seven distinct sets of words for numbers according to the class of the item being counted: for counting flat objects and animals, for round objects and time, for people, for long objects and trees, for canoes, for measures, and for counting when no particular object is being numerated. It seems that the last is a later development while the first six groups show the relics of an older system. This diversity of number names can also be found in some widely-used languages such as Japanese.

Intermixed with the development of a number sense is the development of an ability to count. Counting is not directly related to the formation of a number concept because it is possible to count by matching the items being counted against a group of pebbles, grains of corn, or the counter's fingers. These aids would have been indispensable to very early people who would have found the process impossible without some form of mechanical aid. Such aids, while different, are still used even by the most educated in today's society due to their convenience. Each counting ultimately involves reference to something other than the things being counted. At first, it may have been grains or pebbles but now it is a memorized sequence of words that happen to be the names of the numbers.

17. ***Complete each sentence with the ending which you consider correct according to the text from exercise 16.***

1. A developed system of numbering _____
2. An additional hand signal _____
3. In seventh-century Europe, the ability to count to a certain number _____
4. Thinking about numbers as concepts separate from physical objects _____
5. Expressing number differently according to class of item _____

18. ***Do the following statements agree with the information given in the text from exercise 16? There are three possible options. Choose one option. Discuss your opinions with your groupmates.***

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

1. For the earliest tribes, the concept of sufficiency was more important than the concept of quantity.
2. Indigenous Tasmanians used only four terms to indicate numbers of objects.
3. Some peoples with simple number systems use body language to prevent misunderstanding of expressions of the number.
4. All cultures have been able to express large numbers clearly.
5. The word 'thousand' has Anglo-Saxon origins.
6. In general, people in seventh-century Europe had poor counting ability.
7. In the Tsimshian language, the number for long objects and canoes is expressed with the same word.
8. The Tsimshian language contains both older and newer systems of counting.
9. Early peoples found it easier to count by using their fingers rather than a group of pebbles.

4. SCIENTIFIC AND TECHNOLOGICAL PROGRESS. SCIENCE IN THE XXI CENTURY

19. ***Read the text and answer the questions below it.***

Real World is Finding New Uses for Virtual Reality

Gary Steinberg, Stanford University's head of neurosurgery, has been operating on brains for more than three decades. Only in the past year has he been able to do something that he says gives him a significant advantage: preview the surgery and practice it. Donning a virtual-reality headset, the 64-year-old works through thickets of digital blood vessels in a precise computer simulation of a patient's gray matter before he cuts into the real thing. "I can figure out how best to approach a tumor and practice it so that when I get into the operation, it's as if I've been there before," Dr. Steinberg says. "It makes surgeries safer. Outcomes are better." Virtual Reality has been slow to catch on with consumers, despite the high-profile launches last year of headsets from Facebook Inc.'s Oculus unit and Taiwan's HTC Corp.'

But businesses are taking to it for training in industries from construction to medicine to sports. Executives say customized software that works like 360-degree videogames can help teach employees more effectively, less expensively, and often more safely than traditional methods. Wal-Mart Stores Inc., for example, last week said it would expand VR training to all of its 200 employee training centers this year, after testing it in 31 centers. It plans to make the technology an integral part of training for 140,000 employees annually, says Tom Ward, a Wal-Mart vice president. And while they are pricey for many consumers, VR headsets have become affordable for most businesses: the upmarket HTC Vive VR system sells for about $800. Research firm International Data Corp. estimates total shipments of headsets for VR and augmented reality a related technology that superimposes digital content onto a user's view of the real world will grow at a compounded annual rate of 58% over the next five years. Business demand will be the main driver, with shipments of headsets for commercial uses growing 80% a year, versus 50% for headsets for consumers, says IDC.

VR training is so new that there has been limited ability to measure its effectiveness as a business tool, and it has shortcomings. Some people feel awkward putting on the headsets, and some experience motion sickness. VR doesn't lend itself to training for jobs that require manual dexterity, for example - in the virtual world, you're rarely able to see your hands.

Still, United Rentals Inc. is a believer. The company, which rents generators, backhoes and thousands of other types of equipment, has been testing VR training since December for new sales staff. Instead of giving lectures and showing pictures of construction sites, "we bring the job site into the classroom," says Patrick Barrett, director of training and development.

In its VR training, employees stand on the edge of a virtual construction site, with two minutes to observe and determine what equipment is missing before an avatar of a construction boss approaches and they have to begin their pitch. "Do they see that excavation — a hole in the ground, filled with water; do they see that opportunity to rent that customer a pump?" asks Mr. Barrett. He predicts it will shorten his weeklong training program by half, and is planning to expand the VR training beyond the new hires. At Wal-Mart, trainees scan VR produce and deli sections to spot problems. They also get a virtual preview of a Wal-Mart on one of its busiest holiday shopping days when crowds flood the stores looking for deals.

Questions

1. What does Dr. Gary Steinberg use to practice a patient's brain surgery before actually performing it?
   a. a model of the patient's brain and real surgical tools
   b. a virtual-reality headset and computer simulation
   c. a laptop computer and computer simulation
   d. a written manual with physical descriptions of the patient

2. The text explains some effects of professionals and businesses using Virtual Reality for training in different industries. What is one effect of Dr. Steinberg practicing a patient's brain surgery using Virtual Reality and computer simulation before performing it?
   a. The surgery becomes safer.
   b. The surgery becomes harder.
   c. The surgery takes longer.
   d. The patient becomes sicker.
3. Read these sentences from the text. 'Virtual Reality has been slow to catch on with consumers, despite the high-profile launches last year of headsets from Facebook Inc.'s Oculus unit and Taiwan's HTC Corp.' What conclusion can be drawn based on this evidence?
   a. Some people and companies expected virtual reality to be popular with consumers.
   b. Companies did not think consumers would purchase virtual reality headsets.
   c. Consumer interest in virtual reality is expected to grow in the future.
   d. Businesses were always expected to be interested in using virtual reality for training.
4. How do some businesses believe VR is affecting their training for employees?
   a. They believe it is making their training more enjoyable for employees.
   b. They believe it is making their training cheaper, but less effective.
   c. They believe it is making their training more useful for a wider range of employees.
   d. They believe it is improving their training in a number of ways.
5. What is the main idea of this article?
   a. Virtual Reality is being used by neurosurgeons to help preview and practice a patient's surgery before the surgery actually takes place.
   b. Construction companies and retail stores are finding Virtual Reality to be a more useful tool for training than companies in other industries.
   c. While Virtual Reality headsets are not yet popular with consumers, they are being used for job training across many different industries.
   d. While Virtual Reality headsets are being used by businesses for training, they are expected to become more popular with other consumers.
6. Read these sentences from the text. 'VR training is so new that there has been limited ability to measure its effectiveness as a business tool, and it has shortcomings. Some people feel awkward putting on the headsets, and some experience motion sickness.' Based on these sentences, what does the word shortcoming mean?
   a. a strong advantage
   b. a negative feeling
   c. an expense

d. a weakness or flaw

7. Describe what happens during a Virtual Reality training for United Rentals, Inc., a company which rents equipment to people working on construction sites. (an open answer)
8. How does Virtual Reality affect how the neurosurgeon Dr. Steinberg performs his job? Support your answer with details from the text. (an open answer)
9. How might Virtual Reality training benefit people in society? Support your answer with evidence from the text. (an open answer)

WRITING

20. ***Write an academic essay on the topic "What Is the Role of Science and Technology in the Society?". Write at least 250 words*** **(*see Appendix 2*).**

Writing Tip. You should remember to:

— divide your essay into three parts: introduction, bogy, and conclusion;

— have a clear introduction telling the reader briefly what areas you are going to cover;

— make it clear which side of an argument you are presenting (use clear linking expressions such as 'On the one hand …'; 'On the other hand …') and make sure you do not mix two sides of an argument in the same paragraph;

— give examples clearly (choose good examples which illustrate your argument when you take notes (use expressions such as 'We can see an example of this ... ');

— make it clear when you are giving your own opinion (use expressions such as 'in my view ... '); — give a clear conclusion which relates your argument back to the original question and summarizes your opinion.

21. *Write an academic essay on one of the following topics: "Science and Technology Hazards of Today's Life", "Science is the First Step to Technological Progress". Write at least 250 words* (*see Appendix 2*).

22*. *Translate the text into Russian in a written form. Discuss your translations in the group.*

Mother Earth — Mother Board

Information moves, or we move to it. Moving to it has rarely been popular and is growing unfashionable; nowadays we demand that the information come to us. This can be accomplished in three basic ways: moving physical media around, broadcasting radiation through space, and sending signals through wires. This article is about what will, for a short time anyway, be the biggest and best wire

ever made.

Wires warp cyberspace in the same way wormholes warp physical space: the two points at opposite ends of a wire are, for informational purposes, the same point, even if they are on opposite sides of the planet. The cyberspace-warping power of wires, therefore, changes the geometry of the world of commerce and politics and ideas that we live in. The financial districts of New York, London, and Tokyo, linked by thousands of wires, are much closer to each other than, say, the Bronx is to Manhattan.

Today this is all quite familiar, but in the 19th century, when the first feeble bits struggled down the first undersea cable joining the Old World to the New, it must have made people's hair stand up on end in more than just the purely electrical sense — it must have seemed supernatural. Perhaps this sort of feeling explains why when Samuel Morse stretched a wire between Washington and Baltimore in 1844, the first message he sent with his code was ‘What hath God wrought!’ — almost as if he needed to reassure himself and others that God, and not the Devil, was behind it.

During the decades after Morse's "What hath God wrought!" a plethora of different codes, signaling techniques, and sending and receiving machines were patented. A web of wires was spun across every modern city on the globe, and longer wires were strung between cities. Some of the early technologies were, in retrospect, flaky: one early inventor wanted to use 26-wire cables, one wire for each letter of the alphabet. But it quickly became evident that it was best to keep the number of individual wires as low as possible and find clever ways to fit more information onto them.

This requires more ingenuity than you might think — wires have never been perfectly transparent carriers of data; they have always degraded the information put into them. In general, this gets worse as the wire gets longer, and so as the early telegraph networks spanned greater distances, the people building them had to edge away from the seat-of-the-pants engineering practices that, applied in another field, gave us so many boiler explosions, and toward the more scientific approach that is the standard of practice today.

Still, telegraphy, like many other forms of engineering, retained a certain barnyard, improvised quality until the Year of Our Lord 1858, when the terrifyingly high financial stakes and shockingly formidable technical challenges of the first transatlantic submarine cable brought certain long-simmering conflicts to a rolling boil, incarnated the old and new approaches in the persons of Dr. Wildman Whitehouse and Professor William Thomson, respectively, and brought the conflict between them into the highest possible relief in the form of an inquiry and a scandal that rocked the Victorian world. Thomson came out on top, with a new title and name — Lord Kelvin.

Everything that has occurred in Silicon Valley in the last couple of decades also occurred in the 1850s. Anyone who thinks that wild-ass high tech venture capitalism is a late-20th-century California

phenomenon needs to read about the maniacs who built the first transatlantic cable projects (I recommend Arthur C. Clarke's book *How the World Was One*). The only things that have changed since then are that the stakes have gotten smaller, the process more bureaucratized, and the personalities less interesting.

Those early cables were eventually made to work, albeit not without founding whole new fields of scientific inquiry and generating many lucrative patents. Undersea cables, and long-distance communications in general, became the highest of high tech, with many of the same connotations as rocket science or nuclear physics or brain surgery would acquire in later decades. Some countries and companies (the distinction between countries and companies is hazy in the telco world) became very good at it, and some didn't. AT&T acquired a dominance of the field that largely continues to this day and is only now being seriously challenged by a project called FLAG: the Fiberoptic Link Around the Globe.

Neal Stephenson. https://www.wired.com/author/neal-stephenson/

23*. *Read the text and render it in English in the written form.*

Наука — важнейший национальный ресурс обновляющейся России

1. Российская наука за свою многолетнюю историю внесла огромный вклад в развитие страны и мирового сообщества. Своим положением великой мировой державы Россия во многом обязана достижениям отечественных ученых. В современных условиях практическое использование естественнонаучных, гуманитарных и научно-технических знаний во все большей степени становятся источниками обеспечения жизнедеятельности общества, его духовного и физического здоровья. Уровень развития науки во многом определяет эффективность экономической деятельности, обороноспособность, состояние духовной и политической культуры страны, защищенность личности и общества по отношению к неблагоприятным природным и антропогенным факторам.

2. Важным условием формирования отечественной науки являлось стремление охватить все направления исследований. В стране сформировалась обширная сеть научно-исследовательских организаций как фундаментального, так и прикладного характера. По многим направлениям отечественная наука занимала передовые позиции в мире. Это достигалось за счет высокой квалификации ведущих научных школ, престижности труда ученого и привлечения в науку большого числа исследователей, а также значительного уровня бюджетного финансирования. Однако административно-командный механизм в экономике, высокая степень закрытости и милитаризации научно-технической сферы, неоправданные ограничения прав интеллектуальной собственности снижали эффективность использования научного потенциала страны.

В настоящее время, когда расширяются возможности для свободы научного творчества, открытого обмена информацией и международного сотрудничества, положение российской науки могло бы качественно измениться. Однако системный кризис, сопровождающий период социально-политического переустройства Российской Федерации привел к тому, что перед отечественной наукой встали новые серьезные трудности: крайне недостаточное бюджетное финансирование научно-исследовательских и опытно-конструкторских работ не обеспечивает своевременного обновления материально-технической базы науки, создания нормальных условий жизни и труда ученых, осложняет эффективное государственное регулирование в научной сфере. Престиж профессии ученого упал в обществе до недопустимо низкого уровня, наука перестала быть привлекательной для талантливой молодежи. Со всей очевидностью возникла необходимость коренной реорганизации сферы науки с целью ее адаптации к новым условиям, привлечения дополнительных источников финансирования. По-прежнему остро стоит проблема более эффективного использования результатов научных исследований в народном хозяйстве.

3. Новыми тенденциями в развитии мирового сообщества стали расширение сотрудничества и кооперации государств в решении глобальных проблем, связанных с сохранением среды обитания, обеспечение достойного духовного и физического уровня жизни людей, поддержание здоровья человека. Происходит объединение усилий ученых и инженеров развитых стран в поиске и использовании новых источников энергии, освоении космического пространства, создании открытой информационной среды. Новая стратегия развития науки отдает приоритет исследованиям, имеющим значимость для самой перспективы существования мирового сообщества, для его устойчивого и безопасного развития.

4. Современные тенденции межстрановой интеграции не означают, однако, исчезновения национальных интересов, в том числе в сфере науки. Более того, национальный научный потенциал будет во многом определять место страны в мировом сообществе, перспективы в конкурентной борьбе на внешнем рынке, возможности в решении ее внутренних проблем.

Масштабы и темпы развития отечественной науки должны обеспечить соответствие потенциала России уровню мирового научно-технического прогресса. Приоритетные направления научных исследований определяются также экономическим и геополитическим положением России, глобальным значением запасов ее природных ресурсов, потребностями духовного развития нашего общества, гуманистическими традициями российской науки. Существенное влияние на выбор приоритетов продолжают оказывать и мировые тенденции преобразования человеческой цивилизации на рубеже тысячелетий.

5. Для реального преобразования жизни России в целом, исключительно важное значение

имеет развитие науки в регионах, способствующее их прогрессу с учетом экономических, ресурсных, экологических и культурных особенностей.

Указ Президента Российской Федерации «О доктрине развития российской науки», 13 июня 1996 года, № 884

SELF-STUDY ACTIVITIES

24. ***Read the text and answer the questions below it.***

Solving New York City's Hurricane Problem with Representations

Sketches or drawings can help people communicate to others ideas about how to solve problems, big or small. Drawings make ideas visual, so they are easier to understand than a spoken or written explanation, and using them allows for many different drafts to be presented before deciding on a final product.

When a hurricane hit New York City in 2012, the city realized it was not prepared to handle such a disaster. The hurricane damaged the city badly and left many people without homes. Sea levels were going to continue to rise, which meant potential for more hurricanes and flooding, and the government realized it had to change some things about the city to make it better able to handle future disasters. Rather than simply begin building bigger, stronger structures, like a giant wall around the city or a gate to keep water out, people started sketching out their ideas about how to make New York a place that could better withstand hurricanes. These people were experts chosen to take on the task of reimagining the city. By using drawings, people were able to debate these ideas, decide which ones were best and change them as they saw fit. Drawings also allowed experts in certain areas to show and explain things to people who didn't know as much as them about those subjects.

Some people focused on how to change the city's natural environment, like the grassy areas next to the ocean, to make them more hurricane-friendly. They drew and presented sketches that showed how these areas could be used to absorb seawater. They also drew in things that could be planted to grow better in the changing environment, like plants that can withstand seawater. Others focused on important city buildings like hospitals. Hospitals in New York City were hit hard by the hurricane, and many people struggled to get the emergency care and basic medical help they needed during the disaster. The experts' drawings focused on ways to make hospital buildings stronger so that they could meet people's needs even in a crisis.

Others looked at how to improve public transportation, which is very important to keeping the city running. After the hurricane, many people in the city were stranded with no way to get around because the train system was badly affected by the storm. Transportation experts drew up ways to pump water out of train tunnels more quickly and get trains up and running sooner. People brought their drawings together and looked at all the ways to improve the city. Some ideas had to be rejected

and replaced by more useful ones. The experts presented their ideas to the public at meetings because these changes would affect everyone living in the city and they wanted the citizens to be engaged in the process.

Finally, the city was able to decide on a plan it would use to start making the city stronger, and it used these sketches and representations to figure out other things, like how much it would cost the city, how many workers would be needed and how long the construction projects might take. Using the teamwork of many experts and sketch artists, the city was able to begin planning New York City's future and work toward preventing potential dangers.

Questions

1. What did people use when discussing how to protect New York City against hurricanes?
   a. drawings
   b. medical help
   c. seawater
   d. construction projects
2. The threat of another hurricane is a problem for New York City. What have people done to help solve this problem?
   a. People have moved to homes outside New York City.
   b. People have built sculptures of New York City.
   c. People have figured out ways to change New York City.
   d. People have spent less money on public transportation in New York City.
3. When a hurricane hit New York City in 2012, the city was not fully prepared to handle it. What evidence from the passage supports this statement?
   a. Drawings can help people exchange ideas with each other about how to solve problems, big or small.
   b. Because drawings make ideas visible, they can be easier to understand than spoken or written explanations.
   c. Sea levels are expected to keep rising, which means New York City may experience one or more hurricanes in the future.
   d. Many people struggled to get medical help during the hurricane and were left without homes afterward.
4. What was one reason for using drawings when discussing improvements to New York City after the hurricane?
   a. Some people prefer hearing an idea explained by an expert than seeing a drawing of that idea by a non-expert.
   b. Drawings made it easier for many people to understand the improvements being discussed.

c. During the hurricane, many people in New York City were stranded and could not get the medical care they needed.

d. Some ideas that people came up with were not as good as others and had to be replaced.

5. What is this passage mainly about?

a. the damage that a 2012 hurricane did to hospitals and the train system in New York City

b. ideas that had to be rejected when figuring out ways to protect New York City from hurricanes

c. how grassy areas in New York City next to the ocean could be used to absorb seawater

d. ways to protect New York City from hurricanes and how drawings helped people discuss those ways

6. Read the following sentences: "Some people focused on how to change the city's natural environment, like the grassy areas next to the ocean, to make them more hurricane-friendly. They drew and presented sketches that showed how these areas could be used to absorb seawater." What does the word *sketches* mean?

a. ideas for making something better

b. problems with public transportation

c. drawings without many details

d. meetings between experts and non-experts

7. Choose the answer that best completes the sentence below.

New York City was damaged by a hurricane; …., the city started looking for ways to protect itself against other hurricanes.

a. consequently

b. however

c. before

d. for instance

8. Name one thing that people drew as they worked on ways to protect New York City from hurricanes. (an open answer)

9. What is one example of how the drawings of ways to change New York City were shared? (an open answer)

10. The passages states that "drawings can help people communicate to others ideas about how to solve problems, big or small." Using evidence from the passage, explain how drawings helped people communicate ideas about how to solve New York City's hurricane problem. (an open answer)

25. ***Fill in the gaps with the appropriate words from the list.***

theoretical, identifying, issued, derivatives, assumed, constituent, occurrence,

sectors, process, evident

1. Earthquakes are a frequent daily _____ in many parts of Japan. 2. It is _____ from his playing that he was very nervous about this performance. 3. Recent studies reveal that the floral industry uses the highest level of pesticides of all agricultural _____. 4. Many carpets nowadays are produced using synthetic fibers made of petroleum _____. 5. One of the earliest U.S. passports on record was _____ in France in 1778. 6. Students can learn more quickly by _____ their own weaknesses in the subject they are studying and then taking steps to improve in those areas. 7. By the 19th century, Britain had _____ political control of virtually all of India. 8. I studied practical linguistics to become an ESL teacher, but some other people in my classes were studying _____ linguistics in order to do research. 9. Society can be viewed as a _____ in which human beings construct or negotiate social order. 10. Breaking the sounds of a word into their _____ parts can help students with the pronunciation of a new and difficult word.

26*. ***The following sentences contain mistakes regarding uncountable nouns that have mistakenly been used as if they were countable. Identify the mistakes and correct them.***

1. As far as we know, there has only been one research in this field. 2. These money are collected once a month. 3. This may be an evidence for astrologists. 4. About 60% of the feedbacks were negative. 5. Several informations are now available. 6. The earthquake caused few damages and no fatalities. 7. Garbages represent a big problem in the process of urbanization. In fact, they cause. 8. They did a training during the course. 9. She was the only child of a blind father (he was struck by a lightning) and a mother who died of a cancer when she was a teenager. 10. The sheeps appeared to be in a good health and gained weight like the normal control sheeps.

27. ***Fill in the gaps with the appropriate indefinite pronoun: something, anything, someone, anyone.***

1. Do call if you need _____ else. 2. Is there _____ you're not quite clear about? 3. _____ has come up, so I'm afraid I can't come. 4. Would you like me to go over _____ again? 5. Would you like a coffee, or _____ stronger? 6. Could I leave a message with _____ from administration? 7. Has _____ else in the team looked at the manuscript? 8. Sorry, but _____ is waiting for me. 9. Sorry, I've just seen _____ I know. 10. Would _____ like anything else to eat or drink?

28. Fill in the gaps with the appropriate option: a little, little, a few, few.

1. _____ people came to the conference; it was a real disappointment. 2. You sounded _____ annoyed in your last mail. 3. Do you think you could speak up _____, please? 4. Have you got

_____ minutes? I have _____ questions to ask. 5. He had _____ questions to ask, so it only took me a couple of minutes. 6. I have made _____ changes to the manuscript – don't worry, it will only take you a second to check. 7. I have made _____ changes to the manuscript – would you mind taking a look at them? 8. OK I'll send them to you in _____ minutes. 9. I am afraid we have _____ time left. So, no more questions please. 10. Would you like _____ more wine?

29. ***Choose a scientific article in English concerning your own field of science from any valid information source*** **(*10 000 printed characters*) *and prepare its oral translation into Russian.***

30. ***Search the Internet and go to the libraries to find scientific and technical articles on the topics of Module 1. Analyze the gathered material, then prepare a 10-minute report on the chosen topic. Give a Power Point presentation in the group*** **(*see Appendix 1*).**

MODULE TEST 1

Variant 1

1. *Choose the correct option.*

1. It was *the decision of Adam / Adam's decision* to take out the loan, so he has to take responsibility for repaying it. 2. I saw two great TV programs last week. The first was *an action film / a film about action*. 3. and the second *a documentary about young entrepreneurs / a young entrepreneur's documentary.* 4. John is *someone I worked with in Malaysia's brother / the brother of someone I worked with in Malaysia*. 5. I don't like tomatoes, so I left them at *the side of the plate / the plate's side*. 6. My current *researches are / research is* concerned with blind signal processing, that is. 7. Manipulating or extracting *information / informations* from any kind of signal without knowing the system, or the physical process. 8. The nuclear power station is in an earthquake zone, and it's worrying that there have been *a few / a little* minor tremors here in the last couple of months. 9. *We were all / We all were* astonished by her exam results. 10. Nowadays, *nearly every / nearly each* new car is fitted with airbags.

2. *Fill in the gaps with the appropriate words from the list.*

income, percent, contextualize, exportation, various, distribution, significantly, requirements, laborer, authorize

1. You have to _____ the remark in the overall discussion to fully understand what was meant. 2. I'm not allowed to _____ any purchases. You'll have to talk to my boss. 3. The _____ of raw logs to Asia and the U.S. continues to be one of this province's most important industries. 4. Highly unequal income _____ remains a serious problem in Brazil. 5. Denmark has the highest rate of _____ tax in the world, at 68%. 6. Inflation has risen by less than 1 _____ this year. 7. Obviously, one of the first _____ to be a firefighter is that you be in excellent physical shape. 8. Her English improved _____ after she got a Canadian boyfriend. 9. He works as a _____ on a roadbuilding crew for the city. 10. This restaurant has a wonderful buffet with dishes from _____ countries.

3. *Read the text and answer the questions below it.*

Making Time for Science

Chronobiology might sound a little futuristic — like something from a science fiction novel, perhaps — but it's actually a field of study that concerns one of the oldest processes life on this planet has

ever known: short-term rhythms of time and their effect on flora and fauna. This can take many forms. Marine life, for example, is influenced by tidal patterns. Animals tend to be active or inactive depending on the position of the sun or moon. Numerous creatures, humans included, are largely diurnal — that is, they like to come out during the hours of sunlight. Nocturnal animals, such as bats and possums, prefer to forage by night. A third group are known as crepuscular: they thrive in the lowlight of dawn and dusk and remain inactive at other hours.

When it comes to humans, chronobiologists are interested in what is known as the circadian rhythm. This is the complete cycle our bodies are naturally geared to undergo within the passage of a twenty-four-hour day. Aside from sleeping at night and waking during the day, each cycle involves many other factors such as changes in blood pressure and body temperature. Not everyone has an identical circadian rhythm. 'Night people', for example, often describe how they find it very hard to operate during the morning, but become alert and focused by evening. This is a benign variation within circadian rhythms known as a chronotype.

Scientists have limited abilities to create durable modifications of chronobiological demands. Recent therapeutic developments for humans such as artificial light machines and melatonin administration can reset our circadian rhythms, for example, but our bodies can tell the difference and health suffers when we breach these natural rhythms for extended periods of time. Plants appear no more malleable in this respect; studies demonstrate that vegetables grown in season and ripened on the tree are far higher in essential nutrients than those grown in greenhouses and ripened by laser. Knowledge of chronobiological patterns can have many pragmatic implications for our day-to-day lives. While contemporary living can sometimes appear to subjugate biology — after all, who needs circadian rhythms when we have caffeine pills, energy drinks, shift work and cities that never sleep? — keeping in synch with our body clock is important.

The average urban resident, for example, rouses at the eye-blearing time of 6.04 a.m., which researchers believe to be far too early. One study found that even rising at 7.00 a.m. has deleterious effects on health unless exercise is performed for 30 minutes afterward. The optimum moment has been whittled down to 7.22 a.m.; muscle aches, headaches and moodiness were reported to be lowest by participants in the study who awoke then. Once you're up and ready to go, what then? If you're trying to shed some extra pounds, dieticians are adamant: never skip breakfast. This disorients your circadian rhythm and puts your body in starvation mode. The recommended course of action is to follow an intense workout with a carbohydrate-rich breakfast; the other way around and weight loss results are not as pronounced.

Morning is also great for breaking out the vitamins. Supplement absorption by the body is not temporal-dependent, but naturopath Pam Stone notes that the extra boost at breakfast helps us get energized for the day ahead. For improved absorption, Stone suggests pairing supplements with a

food in which they are soluble and steering clear of caffeinated beverages. Finally, Stone warns to take care with storage; high potency is best for absorption, and warmth and humidity are known to deplete the potency of a supplement. After-dinner espressos are becoming more of a tradition — we have the Italians to thank for that — but to prepare for a good night's sleep we are better off putting the brakes on caffeine consumption as early as 3 p.m. With a seven-hour half-life, a cup of coffee containing 90 mg of caffeine taken at this hour could still leave 45 mg of caffeine in your nervous system at ten o'clock that evening. It is essential that, by the time you are ready to sleep, your body is rid of all traces.

Evenings are important for winding down before sleep; however, dietician Geraldine Georgeou warns that an after-five carbohydrate-fast is more cultural myth than chronobiological demand. This will deprive your body of vital energy needs. Overloading your gut could lead to indigestion, though. Our digestive tracts do not shut down for the night entirely, but their work slows to a crawl as our bodies prepare for sleep. Consuming a modest snack should be entirely sufficient.

Questions

1. What did researchers identify as the ideal time to wake up in the morning?
    a. 6.04
    b. 7.00
    c. 7.22
    d. 7.30
2. In order to lose weight, we should …
    a. avoid eating breakfast.
    b. eat a low carbohydrate breakfast.
    c. exercise before breakfast.
    d. exercise after breakfast.
3. Which is not mentioned as a way to improve supplement absorption?
    a. Avoiding drinks containing caffeine while taking supplements.
    b. Taking supplements at breakfast.
    c. Taking supplements with foods that can dissolve them.
    d. Storing supplements in a cool, dry environment.
4. In the evening, we should …
    a. stay away from carbohydrates.
    b. stop exercising.
    c. eat as much as possible.
    d. eat a light meal.
5. Which of the following phrases best describes the main aim of the text?

a. To suggest healthier ways of eating, sleeping and exercising.
b. To describe how modern life has made chronobiology largely irrelevant.
c. To introduce chronobiology and describe some practical applications.
d. To plan a daily schedule that can alter our natural chronobiological rhythms.

Variant 2

1. *Choose the correct option.*

1. He apologized without *the hesitation of a moment / a moment's hesitation*. 2. My house is by *a children playground / a children's playground*, so it can be quite noisy. 3. *The construction of the new library / The new library's construction* took so long that building costs were ten times higher than first expected. 4. I am an enthusiastic and motivated twenty-four-*year-old / -years-old* electronics engineer with a special interest in XYZ. 5. I have spent *the last / last* six months doing *an / the* internship at XTX Semiconductors Inc. in Richmond. 6. The hurricane will go north of the city, so *a little / a few* major damage is expected. 7. These old bookshelves *will all be / all will be* replaced by cupboards. 8. It takes me *fewer / less* than 30 minutes to walk to work. 9. I believe our research would provide *a / an / the* unique contribution to this important subject. 10. We think that these findings provide *any / some* new information for *researchers / the researchers*.

2. *Fill in the gaps with the appropriate words from the list.*

specifics, established, data, area, interpretation, principle, major, role, concept, reformulate

1. In some cultures, there is no _____ of personal public space, so bumping into people by accident in the street is considered normal and does not indicate rudeness. 2. The Internet was born in 1969 when researchers linked two computers using a 15-foot cable, testing a new way for exchanging _____ over networks. 3. In the seventeenth century, Bacon, Descartes, Galileo, Kepler, Liebniz and Newton _____ the foundations of modern science, mathematics, and rational thought. 4. According to Gandhi, politics without _____ is a sin. 5. Most networks link computers within a limited _____, such as within a department, office or building. 6. The _____ of the Bible has changed throughout the years. 7. We need to draw up some general guidelines for the project before we start getting down to _____. 8. The team of scientists had to completely _____ its hypothesis after analyzing the results of their experiments. 9. In my opinion, Daniel Craig has been the best person to play the _____ of secret agent James Bond in the Bond movies. 10. Our hands are recognized by medical professionals as a _____ source for spreading flu and cold germs.

3. ***Read the text and answer the questions below it.***

The Return of Artificial Intelligence

A. After years in the wilderness, the term 'artificial intelligence' (AI) seems poised to make a comeback. AI was big in the 1980s but vanished in the 1990s. It re-entered public consciousness with the release of AI, a movie about a robot boy. This has ignited a public debate about AI, but the term is also being used once more within the computer industry. Researchers, executives and marketing people are now using the expression without irony or inverted commas. And it is not always hype. The term is being applied, with some justification, to products that depend on technology that was originally developed by AI researchers. Admittedly, the rehabilitation of the term has a long way to go, and some firms still prefer to avoid using it. But the fact that others are starting to use it again suggests that AI has moved on from being seen as an over-ambitious and under-achieving field of research.

B. The field was launched, and the term 'artificial intelligence' coined, at a conference in 1956 by a group of researchers that included Marvin Minsky, John McCarthy, Herbert Simon and Alan Newell, all of whom went on to become leading figures in the field. The expression provided an attractive but informative name for a research program that encompassed such previously disparate fields as operations research, cybernetics, logic and computer science. The goal they shared was an attempt to capture or mimic human abilities using machines. That said, different groups of researchers attacked different problems, from speech recognition to chess playing, in different ways; AI unified the field in name only. But it was a term that captured the public imagination.

C. Most researchers agree that AI peaked around 1985. A public reared on science-fiction movies and excited by the growing power of computers had high expectations. For years, AI researchers had implied that a breakthrough was just around the corner. Marvin Minsky said in 1967 that within a generation the problem of creating 'artificial intelligence' would be substantially solved. Prototypes of medical-diagnosis programs and speech recognition software appeared to be making progress. It proved to be a false dawn. Thinking computers and household robots failed to materialize, and a backlash ensued. "There was undue optimism in the early 1980s," says David Leaky, a researcher at Indiana University. Then when people realized these were hard problems, there was retrenchment. By the late 1980s, the term AI was being avoided by many researchers, who opted instead to align themselves with specific sub-disciplines such as neural networks, agent technology, case-based reasoning, and so on.

D. Ironically, in some ways AI was a victim of its own success. Whenever an apparently mundane problem was solved, such as building a system that could land an aircraft unattended, the problem was deemed not to have been AI in the first plate. "If it works, it can't be AI," as Dr. Leaky characterizes it. The effect of repeatedly moving the goal-posts in this way was that AI came to refer to

‘blue-sky’ research that was still years away from commercialization. Researchers joked that AI stood for almost implemented. Meanwhile, the technologies that made it onto the market, such as speech recognition, language translation and decision-support software, were no longer regarded as AI. Yet all three once fell well within the umbrella of AI research.

E. But the tide may now be turning, according to Dr. Leake. HNC Software of San Diego, backed by a government agency, reckon that their new approach to artificial intelligence is the most powerful and promising approach ever discovered. HNC claim that their system, based on a cluster of 30 processors, could be used to spot camouflaged vehicles on a battlefield or extract a voice signal from a noisy background — tasks humans can do well, but computers cannot. “Whether or not their technology lives up to the claims made for it, the fact that HNC are emphasizing the use of AI is itself an interesting development,” says Dr. Leaky.

F. Another factor that may boost the prospects for AI in the near future is that investors are now looking for firms using clever technology, rather than just a clever business model, to differentiate themselves. In particular, the problem of information overload, exacerbated by the growth of e-mail and the explosion in the number of web pages, means there are plenty of opportunities for new technologies to help filter and categorize information — classic AI problems. That may mean that more artificial intelligence companies will start to emerge to meet this challenge.

G. The 1969 film, 2001: A Space Odyssey, featured an intelligent computer called HAL 9000. As well as understanding and speaking English, HAL could play chess and even learned to lipread. HAL thus encapsulated the optimism of the 1960s that intelligent computers would be widespread by 2001. But 2001 has been and gone, and there is still no sign of a HAL-like computer. Individual systems can play chess or transcribe speech, but a general theory of machine intelligence still remains elusive. It may be, however, that the comparison with HAL no longer seems quite so important, and AI can now be judged by what it can do, rather than by how well it matches up to a 30-year-old science-fiction film. “People are beginning to realize that there are impressive things that these systems can do,” says Dr. Leake hopefully.

Questions

1. According to researchers, in the late 1980s, there was a feeling that …
   a. a general theory of AI would never be developed.
   b. original expectations of AI may not have been justified.
   c. a wide range of applications was close to fruition.
   d. more powerful computers were the key to further progress.
2. In Dr. Leake’s opinion, the reputation of AI suffered as a result of …
   a. changing perceptions.
   b. premature implementation.

c. poorly planned projects.
d. commercial pressures.

3. The prospects for AI may benefit from …
   a. existing AI applications.
   b. new business models.
   c. orders from Internet-only companies.
   d. new investment priorities.

4. Which paragraph (A–G) contains the information about the fact that AI brings together a range of separate research areas?
   a. paragraph A
   b. paragraph C
   c. paragraph D
   d. no paragraph

5. Where was the expression AI first used?
   a. in the 1980s
   b. within the computer industry era
   c. in the 1990s
   d. around 1985

Module 2

EVOLUTION OF SCIENTIFIC WORLDVIEW

Academic Word List: achieve, acquire, alternative, appropriate, aspect, assist, category, circumstance, comment, community, compensate, complex, component, compute, conclude, conduct, consent, consequent, considerable, constant, constrain, construct, consume, contribute, convene, coordinate, core, corporate, correspond, credit, criteria, culture, deduce, demonstrate, dominate, element, emphasis, ensure, equate, evaluate, exclude, feature, framework, fund, illustrate, immigrate, impact, imply, initial, instance, institute, interact, invest, justify, layer, link, locate, maintain, maximize, minor, negate, normalize, obtain, outcome, participate, partner, potential, previous, primary, proportion, purchase, react, register, regulate, relevant, rely, remove, reside, resource, restrict, scheme, seek, select, sequence, shift, site, specify, strategy, sufficient, technical, technique, technology, tradition, transfer, valid, volume.

GRAMMAR REVISION

Forms of Adjectives and Adverbs

1. Fill in the gaps with the correct comparative or superlative form of the adjectives in brackets.

1. If the holder of the men's high jump record (i.e. the man who has jumped _____ (*high)* than anyone else in the world) had made his jump on Mercury, where gravity is _____ *(weak)*; then he would have jumped nearly two times _____ *(high)*. 2. Although Europe is the second _____ *(small)* continent in terms of area, it has the second _____ *(long)* coastline. 3. If it had been made from the top of Mount Everest, the world's _____ *(deep)* drilling hole for oil would still have extended nearly 1,000 m below sea level. 4. A baby grows _____ *(fast)* in the last three months before birth. If a child continued to grow at this rate at the age of ten it would be 5.6 m _____ *(tall)*. 5. A bamboo shoot can grow as _____ *(many, much)* centimeters in one day as an average child grows in its first ten years of after birth. 6. France is nearly twice as _____ *(big)* as Italy. 7. Denmark has nearly the same _____ *(large)* surface area as the Netherlands. 8. Zaire is the second _____ *(large)* country in Africa. 9. Argentina is not so _____ *(big)* as Brazil. 10. This value is _____ *(great)* than that value.

Numbers

2. ***Choose the correct option.***

The oil age began about (1) *150 / one hundred and fifty* years ago. Today oil is still the main source

of energy and provides about (2) *30% / the 30%* of the world's total primary energy supply, while the entire set of fossil energies makes up more than (3) *eighty per cent / 80%*. The average American consumes (4) *314 GJ / 314 GJs*, whereas the pro-capita primary energy consumption in OECD countries is 195 GJ. The energy contained in (5) *1 / one* barrel of oil is more than 6 GJ. Such heat content would be generated by human muscles in about (6) *2.5 / two and a half* years. The average per-capita availability of all forms of energy remained low and stagnant for a very long period of time. The US consumption of fossil fuels surpassed that of biomass only in the early (7) *1880s / 1880's*. During the second half of the (8) *19th / XIX century*, the average per capita supply of all energy forms increased by only twenty-five (9) *per cent / percent*. In contrast, human advances during the (10) *20 / twentieth* century were strongly linked with an unprecedented rise in total energy consumption. The International Energy Agency (IEA) estimates that the delivery of energy from renewables will increase from 840 Mtoe to between 1,900 and 3,250 Mtoe in 2035 — more than (11) *twice / two times* and (12) *4 / four* times the current level, respectively. Specifically, IEA estimates that the share of renewables in the generation of global electricity will increase to almost (13) *a third / 1/3* in 2035. The share of renewables in heat is expected to increase from (14) *10% to 16% / 10–16%*, and the demand for biofuels will grow (15) *four-fold / 4-fold* in the same period.

Relative Pronouns: That, Which, Who, Whose, What, Who, Whose

3. *Choose the correct option.*

1. We used a bar code to identify a specimen *which / whose* DNA was degraded. 2. A group of accountants, all of *which / whose* members are equally successful, was identified. 3. My professor, *who / which* comes from Bangalore, is very friendly. 4. The professor *that / which* I have now is much better than my previous one. 5. My professor comes from Kenya, *who / which* is why he speaks such good English. 6. Over there is the professor *that / who* I told you about yesterday. 7. The method *that / which* uses X is better than the one *that / which* uses *Y*. 8. This method, *that / which* uses *X*, is extremely effective. 9. This method is extremely effective, *that / which* is why we use it. 10. The table *that / which* is easiest to understand is the one *that / which* is at the bottom of page 3. 11. Table 5, *that / which* is easy for even non-expert readers to understand, highlights that. 12. He still lives in Turkey, *that / which* is where he was born.

Verb. Present Simple or Present Continuous?

4. *Fill in the gaps with the correct form of the verbs in brackets.*

1. This workshop _____ (*take place*) in the Art Gallery every Wednesday from 10 am-12 pm. 2. The whole team _____ (*perform*) well at the moment. I believe they will win. 3. In the UK, students _____ (*enter*) law undergraduate degree programs immediately after high school. 4. Natural

gas prices _____ (*fall*) as a result of relatively warm weather in much of the U.S. 5. Green plants _____ (*consume*) carbon dioxide and _____ (release) oxygen under the influence of light. 6. What _____ (*you* / *do*)? I _____ (try) to write an essay. 7. Please be quiet! I _____ (*want*) to watch the game. 8. The company _____ (*operate*) a wide range of cultural sightseeing every year. 9. My parents _____ (*sail*) around western Italy this summer, and probably won't be back until late September. 10. Paula is busy right now. She _____ (*talk*) on the phone with her dad.

Verb. Past Simple

5. ***Complete the passage filling in the gaps with the correct verbs from the list.***

be, enjoy, mean, travel, worry, feel, suffer, take, spend, have

The pace of life in today's society is much faster than in the past, because of changes in people's habits and in the world of work. In the past, there were both advantages and disadvantages to living a slower paced-life. There _____ (1) a number of benefits of people's lifestyle in the past. Firstly, people probably _____ (2) less from stress because they were not often in a hurry. Secondly, they _____ (3) more time with friends and family, especially at mealtimes and on traditional holidays. People _____ (4) less about being the best in their job or about earning a lot of money. They probably _____ (5) happier. However, in my view, the slower pace of life also _____ (6) several important disadvantages. People _____ (7) much less, either for work or holidays, so their lives were more limited. Basic tasks such as carrying objects, cleaning and washing _____ (8) up a lot of their time. As a result, they _____ (9) their free time less than people today. The slower pace of life also _____ (10) that it was more difficult for people to change or improve their situation by studying of finding a better job.

Verb. Past Simple, Present Perfect Simple

6. ***Read the text describing a chart and fill in the gaps with the past simple or present perfect simple of the verbs in brackets to make true sentences.***

1. The chart shows the percentage of American students who _____ (*use*) illicit drugs since 2000. 2. The proportion of female students who have ever used illicit drugs _____ (*increase*) by more than 50% since 2000. 3. In 2010, the percentage of American male students reported to be using drugs _____ (*rise*) to 50%. 4. From the graph we can see that illicit drug use among American female students _____ (*rise*) each year. 5. The percentage of male students who used illicit drugs _____ (*be*) greater than the percentage of female students from 2000 to 2010. 6. However, American female students _____ (*overtake*) male students in drug usage since 2010. 7. The overall

drug-use rate among American students _____ (*grow*) each year and the most significant rise _____ (*occur*) between 2000 and 2005.

Verb. Present Perfect, Present Perfect Continuous

7*. *Fill in the gaps with the correct form of the verbs in brackets.*

1. Carlos _____ *(call)* six times this morning, so you'd better ring him. 2. We _____ *(receive)* only three pages of your six-page fax. Could you send the last two pages again please? 3. I apologize for the delay in responding but Dr. Elly _____ *(leave)* our institute. 4. I _____ *(try)* your Skype number several times, but I _____ *(have)* no success. 5. Sorry but we _____ *(have)* emailing problems. 6. They _____ *(know)* each other since they were at college together. 7. I hear you _____ *(have)* problems uploading your manuscript. I _____ *(speak*) to the systems manager and she _____ *(assure)* me that she will contact you by midday today. 8. I _____ *(try)* to ring you all morning, where are you? I just wanted to tell you that I _____ *(start)* working on the new project. In fact, we _____ *(work)* on it for three months and we _____ *(achieve)* some great results.

Verb. Present Simple, Will

8. *Choose the correct option.*

1. One area of future study *is / will be* to represent these relationships more explicitly. 2. Phase 1 (of a project proposal): During this phase, we *make / will make* a preliminary description of the problem. 3. When I *graduate / will graduate, I plan / will plan* to find a job in industry. 4. Future work *involves / will involve* the application of the proposed algorithm to medical data. 5. Of great concern for the next decade is that energy consumption *rises / will rise,* and the country *becomes / will become* more dependent on imported petroleum. 6. In this section we *analyze / will analyze* Hartlett's basic assumptions. 7. How *do / will* social robots help us to understand autism? 8. Abstract: In this paper, we *discuss / will discuss* the consequences of the monoculture that is spreading rapidly across the Anglo world and how this *soon impacts / will soon impact* on the perception of the Anglo world in the Middle East. 9. These aspects *are / will be* discussed further in the following subsections. 10. If this *happens / will happen,* then it *has / will have* serious consequences for world oil production.

READING AND SPEAKING

1. HISTORY OF SCIENCE DEVELOPMENT

9. Read the text and answer the questions below it.

Space Telescope Finds Hundreds of New Worlds

They're out there in the depths of space. There are giant ones, small ones, weird ones, and most likely ones we can't even imagine. We're talking about planets, of course. For years, astronomers have speculated that the sun is not the only star with planets circling it. Now, thanks to the Kepler space telescope, they have proof that our Milky Way galaxy could actually be teeming with planets of all sizes and types. Scientists call planets orbiting stars other than our sun extrasolar planets, or exoplanets for short.

Kepler Spans the Sky

The Kepler space telescope was launched on March 7, 2009. It is named after Johannes Kepler, the 16th-century German astronomer who discovered the laws of planetary motion. The telescope, which orbits the sun between Earth and Mars, is the most advanced and sensitive optical telescope ever constructed. It is so light sensitive that, if it were pointed back toward Earth at night, it would be able to detect when one person in a small town turned off a single porch light.

Kepler's mission, however, is not to detect porch lights. The spacecraft has one mission only — exoplanet hunting. For nearly two years, it has been peering at approximately 100,000 stars in a portion of the Milky Way. On February 2, NASA, the U.S. space agency, released its findings from Kepler's sky search conducted between May and September 2009. The telescope had discovered 1,235 possible exoplanets orbiting 997 stars. The find includes 68 about the size of Earth and 54 planets in what scientists call the Goldilocks zone — the zone around a star that permits liquid surface water, considered an essential condition to produce life.

How to Find an Exoplanet

As sensitive as it is, Kepler cannot see the planets themselves. The stars it is looking at are from a few hundred to a few thousand light-years away. A light-year is the distance that light, traveling at 186,000 miles per second, covers in a year. That distance comes to approximately 5.9 trillion miles. Kepler uses what scientists call the transit technique. The telescope is able to measure the very slight drop in starlight that occurs when an orbiting object passes in front of a star. Once Kepler registers an object passing around a star (usually after three passes), teams of scientists on Earth begin to focus on the object and try to analyze it.

Ground-based telescopes at the W. M. Keck Observatory in Hawaii, for example, are used to determine a possible planet's mass. Astronomers do that by measuring a star's wobbles — the tiny back-and-forth movements caused by the pull of a planet's gravity. Once size and mass are determined, as well as the type of star an exoplanet orbits, astronomers can make an educated guess as to what the planet is composed of. Sometimes the planet can be rocky, such as Earth, or gaseous, similar

to Jupiter or Saturn. Or it may be some other type of exoplanet altogether.

Hot Jupiter's and Rogue Planets

It takes time and a lot of work for astronomers to verify that what Kepler notices is, indeed, an exoplanet, and what kind of planet it might be. That is why it has taken two years to confirm many of Kepler's discoveries. So far, Kepler has led to the discovery of a number of different types of exoplanets: • hot Jupiter's large planets like Jupiter mainly made up of gas; they orbit their stars as closely as Mercury orbits our sun; • super-Neptune's-gas planets similar to Neptune that also orbit close to their stars; • rogue planets — planet-sized objects that have been ejected from their star systems and are no longer bound to their stars by gravity.

Kepler-10b

In January, 2011, NASA scientists announced that they had discovered, for the first time, an Earth-like rocky exoplanet rather than a gas giant. The exoplanet, which they named Kepler-10b, orbits a sun-like star 560 light-years from Earth. Unfortunately, Kepler-10b is unlikely to support life, as it is 60 times closer to its star than Earth is to the sun. It is also 1.6 times denser than Earth - roughly the density of an "iron dumbbell," says astronomer Natalie Batalha, the leader of the Kepler team. Some believe that Kepler-10b may have originated much farther from its star and moved inward. If the planet supported life in the past, say astronomers, there is no way it could now. Still, Kepler- 10b will go down in the history books as the most Earth-like exoplanet ever discovered — so far.

Continuing the Search

Many astronomers think that it is only a matter of time before Kepler locates Earth's twin revolving around a star that may even be close to us. The space telescope has surveyed only a tiny fraction of the stars in the Milky Way. Once an Earth-like exoplanet is discovered, however, finding out whether it has all the ingredients for life will be a new hurdle. It will require costly new telescopes, including one capable of scanning such planets for evidence of oxygen, water, and carbon dioxide. Such a huge scientific mission will be expensive, but many scientists believe the exploration should continue at any cost. "We are at a very special moment in the history of mankind," Cornell University astronomer Martha Haynes told The Associated Press.

Questions

1. To which planet do scientists compare Kepler-10b?
   a. Earth
   b. Jupiter
   c. Neptune
   d. Mars

2. The Kepler space telescope was launched on March 7, 2009. What is an effect of this occurrence?
   a. Johannes Kepler has recently been interviewed by several television stations.
   b. Earth's twin has been located revolving around a star in the Milky Way.
   c. Astronauts are traveling to several super-Neptunes to conduct research.
   d. Scientists have discovered hundreds of exoplanets in the Milky Way.
3. What can you conclude after reading the passage?
   a. Many astronomers agree that exoplanets aren't worth studying.
   b. In the near future, astronauts will be able to visit Kepler-10b.
   c. Most exoplanets have oxygen, water, and carbon dioxide.
   d. Scientists will continue to search for Earth-like exoplanets.
4. Read this sentence from the passage: "For years, astronomers have speculated that the sun is not the only star with planets circling it." In this sentence, the word speculated means …
   a. competed with members in the same group.
   b. persuaded others to believe false information.
   c. formed a belief without hard evidence.
   d. stopped a mission that was unsuccessful
5. The primary purpose of this passage is …
   a. to describe the mission of the Kepler space telescope .
   b. to explain why so many different types of exoplanets exist.
   c. to list the features of stars in the Goldilocks zone.
   d. to discuss NASA's plans for the future of astronomy.
6. What are exoplanets? (an open answer)
7. The author writes that Kepler-10b is "unlikely to support life because it is 60 times closer to its star than Earth is to the sun." Why might the author draw this conclusion? (an open answer)
8. The question below is an incomplete sentence. Choose the word that best completes the sentence. Astronomers determine an exoplanet's size and mass _____ making an educated guess as to what the planet is composed of.
   a. because
   b. before
   c. however
   d. although

10. ***Draw the table containing word families for the words from this Module Academic Word List. Complete Table 2.1. Sometimes more than one form may be possible. If you are unsure about a form, check Appendix 4. The first two words are done for you.***

Table 2.1. Word Families for Module 2 Academic Word List

Verb	*Noun*	*Adjective*	*Adverb*	*Participle I, II*
achieve	achievement(s)	achievable	achievably	achieving achieved
acquire	acquisition(s)	acquirable	X	acquiring acquired

11. ***Fill in the gaps with the appropriate words from the list.***

categorization, document, schemes, task, purchased, proportionately, resource, acquire, funded, strategists, minority, interact, considerable, core, alternatives, reinvestment, featuring, participated, conclusion, culturally

1. The young boy showed _____ promise as a diver within his first year of competition. 2. Men are in a _____ in my class. 3. You should _____ all your discussions with the boss so that if there is any problem later, you will have all the necessary information at hand. 4. Millions of people now _____ with their computers on a daily basis. 5. In 1980, the people of Denmark decided not to develop nuclear energy, and instead are experimenting with other energy _____. 6. It is your _____ to make sure that the mail is distributed to the different departments within the division. 7. The symphony is _____ entirely through donations by local businesses. 8. The hummingbird's tiny brain, 4.2 percent of its body weight, is _____ the largest in the bird kingdom. 9. Successful _____ to testing drugs on animals include test tube studies on human tissue cultures, statistics and computer models. 10. As people move to the suburbs, the _____ of many cities becomes drained of residents. 11. Police forces in Vancouver worked to develop a _____ sensitive security program for the 2010 Olympic Games. 12. King George III originally _____ Buckingham House in 1761 for his wife, Queen Charlotte. 13. The international community must encourage _____ in Lebanon as it rebuilds in order to help create political stability in the region. 14. The military _____ were meeting to plan their next attack. 15. Mahatma Gandhi once said “I came to the _____ long ago that all religions were true, and also that all had some error in them.” 16. She has seen every movie ever made _____ Johnny Depp. 17. Our sense of touch allows us to _____ information about the weight, shape, firmness and texture of objects in our environment. 18. When the World Cup of Soccer began in 1930, thirteen nations _____, and Uruguay won the first competition. 19. John Kennedy once said that the human mind is our fundamental _____. 20. The _____ of movies in this country depends on the presence of adult language, and depictions of drug use, violence, or sex.

2. PRACTICAL USE OF SCIENTIFIC KNOWLEDGE

12. ***Read the text and answer the questions below it.***

How to Make a Better Robot

Many people think that robots are an inevitable part of the future. It would be pretty cool to have a droid friend around to save the day, or even just to keep you company when you got bored. While it may seem like something out of science fiction, researchers are already imagining a world in which robots become a more integrated part of our lives. We already have robots among us: some are designed to work in factories, creating uniform products continuously. You may even have one in your home, in the form of a little vacuum cleaner that self-drives itself around the floor. But for robots to make it to the next level, scientists think they'll need to be a bit more versatile. The robot scientists are imagining look nothing like the stiff creatures you might be thinking of. No need for an awkward robot with stiff legs that attempts to walk and act like we walk and act — researchers are hoping to cook up something entirely different from what we're used to seeing.

How to Design a Robot

A group of researchers at Cornell University thinks the future of robots will actually be full of softbots. A softbot is simply a robot made out of soft tissue, so it can move more flexibly than a hard-bodied robot. And with the rise of 3D printers, building softbots is easier now than ever before. The question that remains is: what will these robots look like? How will they move? How will they carry things, or navigate small quarters? These are precisely the questions these scientists are trying to answer. It's easy enough to build a robot that mimics a human. We already know what we look like and how we move. But how do we know this is the best way for robots to move? To put it simply, we don't.

The researchers are trying to figure out all the different ways robots could move. They're basically in the middle of a very long brainstorming session. Once they realize what the options are, they can figure out which motions are best suited to which actions, and create a final model that will perform the best in all scenarios. In order to do this, they've built a computer program that simulates the growth and movement of several kinds of softbots. They can use animated tissue, muscle, and bone to build a large number of different kinds of softbots. Then the computer program runs the robots through tests, checking out things like balance, coordination, or noisiness. In one example, they're looking for speed, so the fastest robots get to stick around, while the slowest robots get cut.

The Possibilities

We're going to take a look at all of the different options for how a robot can move from one point to another this is the speed test. Scientists run a computer program several times, and each time, the

robots are a little bit different. Sometimes, they focus on giving the robots legs either two legs like humans have, or four, like many animals have. And sometimes they see if they can make a mover without legs. The fastest robot they created has legs and runs in a bounding motion — the front legs move together and the back legs bound forward, similar to how a cheetah moves. Another robot was made to have long legs that were mostly made of bone. These legs became long and skinny, so it wasn't surprising when the robot started to gallop like a horse.

Other times, they try to make robots that can move in non-traditional ways. In one instance, they created a funny sort of robot that doesn't have very much structure, just a big blob of muscle. This robot moves by inching its body forward, pulling its body in tight, and then releasing it to go long, much like an inch worm. It's not a very fast robot, but it does have an advantage, the researchers realized. If they picked this robot up and dropped it randomly somewhere else, the robot would just keep on moving as if nothing had happened. The researchers realized this trade-off-the bot may not be very fast, but it certainly is durable.

They even make some robots that seem almost silly from the outset. For example, some of their creations are designed to have no legs at all, but they still had to figure out a way to move them forward. One of the designs that resulted from this is a big robot that, instead of legs, has two large wings, and it flaps them back and forth to move. The design is almost like a gorilla relying primarily on its arms to move, but it's a bit bulkier. Another robot that came out of this is a little guy who looks like an open jack-in-the-box. The bottom of the body is box-shaped, but at the top, out pops two little arms. This robot moves by flailing its arms back and forth, which make the little guy slowly progress forward. It may seem silly, but an advantage this robot has is that it could easily hold things in its hands, or its empty lower-box while still moving forward.

Putting Ideas into Action

Now that the researchers have a number of ideas in mind, they can start performing other tests to see which robots perform better at tasks besides moving themselves along. Maybe they'll have to measure how much energy the robot requires to function for a long period of time, or how much space it takes up. All three of these aspects will play into the future success of the robot, so it's important to consider them all separately. Even if something ends up looking silly in a trial, the underlying reason behind its success may still warrant a characteristic to be considered for the final design. For example, perhaps one of the softbot's tasks will be to take out the garbage (wouldn't that be nice?). For that, you'd want a robot that could carry things and one not likely to fall. You'd also want a robot that was pretty quick, but you'd have to balance your desire for speed with steadiness. If the bot drops its load half the time, on average, it won't be so fast. Therefore, you have to incorporate a number of skills.

When making the robot, the researchers will have to look through all of the ideas they've created in their computer program, and pick and choose which characteristics will work best together to create

a robot that can easily take out the garbage. They'll have to balance their desire for speed with a steady hand, and the ability to carry heavy loads with a desire to make the robot light enough for a human to move around if the robots turned off. A good way to think about it may be through imagining yourself picking out your favorite clothes to wear. One day you may be torn between wearing the T-shirt that's extra soft, so it's really comfortable to wear, and another shirt that's your favorite color. Having to pick between these options will probably convince you to eventually find a new shirt that is both the fabric that you like and the color that you like. Now this new shirt will probably be your favorite, since it has all of the positive qualities you love.

The Final Product

Going back to designing our robot that will help take out the trash, it might be nice for the robot to be fast, but is that really the most important thing? It might be better to have a slower robot take out the trash. That way, there's less of a chance the robot will fall and drop the trash (making it necessary for you to clean it up). In that case, let's go back to the robot that moves sort of like an inchworm. That robot had a lot of body mass on the ground, so it was tough to tip over — think about tipping over a butter dish versus a candlestick.

Maybe when the robot has taken the trash out, you will want it to be fast. The best thing to do then is allow it to separate its front section into two legs, and its back section into two legs. Then it can move in that cheetah-like style, going faster. Perhaps the design of incorporating both ideas into one will result in a final product that isn't completely an inch-wormer, and isn't completely a cheetah either. The robot's body is a little too sleek to be a worm and a little too lumpy to be a cheetah. But the beauty of the final design is that the robot is more versatile, and can do everything you need it to do. Hopefully, these types of robots will enter our lives soon. The Cornell researchers will just have to keep brainstorming different types of robot bodies, so we can always have the best selection of traits to pick from.

Questions

1. What are scientists at Cornell University trying to figure out?
    a. How to build a computer program that simulates the movement of softbots.
    b. All the different tasks robots could perform.
    c. All the different materials robots could be made of.
    d. All the different ways robots could move.
2. Why does the author describe the different robot scientists are creating with a computer program?
    a. To show that scientists are unsure about what type of robot to build.
    b. To show how complex these computer programs can be.
    c. To show that the scientists' brainstorm session will take a long time.
    d. To show a variety of ways that robots could move.

3. Scientists must consider a variety of factors when designing a robot. What evidence from the text supports this conclusion?
   a. Researchers are already imagining a world in which robots become a more integrated part of our lives.
   b. Scientists at Cornell University have built a computer program that allows them to simulate the movement of a robot before they develop a final design of the robot.
   c. If a softbot is being designed to take out the trash, the softbot's ability to be steady must be balanced with its ability to be quick.
   d. The fastest robot created by scientists runs in a bounding motion, similar to how a cheetah moves.
4. What can be concluded about the purpose many robots will have in the future?
   a. Robots will be created to allow scientists to use computer programs.
   b. Robots will be created to move in non-traditional ways.
   c. Robots will be created to make life easier for humans.
   d. Robots will be created to help scientists brainstorm.
5. What is this passage mainly about?
   a. Scientists who work at Cornell University.
   b. The process scientists are using to design robots.
   c. Computer programs scientists are using to design robots.
   d. Robots that can move like humans.
6. Choose the answer that best completes the sentence "Scientists have built a computer program that simulates several kinds of softbots, _____ they can figure out which model works best."
   a. however
   b. so
   c. although
   d. after
7. After scientists have a number of ideas about robot movement in mind, what types of tests do they then perform? (an open answer)
8. According to the passage, what would be a good design for a softbot that would take out the trash? (an open answer)
9. Scientists need to test different abilities of the robots. While scientists perform these tests, they measure how much energy the robots require to function for a long period of time and how much space they take up. Why do the scientists run these tests and track these measurements to create a final model? Use evidence from the text to support your answer. (an open answer)

13. ***Fill in the gaps with the appropriate words from the list.***

instances, sufficient, maximum, coordinates, remove, demonstrate, framework, volume, physical, consent

1. The cost to repair your car should be no more than $500, _____. 2. We need to draw up a _____ for payment of our debts before they become too big. 3. An ostrich egg is equal in _____ to 24 chicken eggs. 4. The police cannot search your house without your _____ unless they have a legal warrant. 5. To obtain _____ nourishment, a panda consumes as much as 36 kilograms of bamboo daily. 6. We need the latitude and longitude _____ of your ship in order to locate you more quickly. 7. Do you want me to _____ how the software works for you? 8. In Japan, the second Monday of October is called Taiiku no Hi, or Sports Day, and is a national holiday intended to foster healthy minds and bodies through _____ activity. 9. Any further _____ of poor behavior on your part will be severely punished. 10. The robot was able to _____ its own head, and fix it whenever necessary.

3. PROCESS OF UNDERSTANDING THE WORLD AROUND US

14. Read the text and find information about the translation of thoughts to language in the brain.

Mind Readers

It may one day be possible to eavesdrop on another person's inner voice.

As you begin to read this article and your eyes follow the words across the page, you may be aware of a voice in your head silently muttering along. The very same thing happens when we write: a private, internal narrative shapes the words before we commit them to text. What if it were possible to tap into this inner voice? Thinking of words does, after all, create characteristic electrical signals in our brains, and decoding them could make it possible to piece together someone's thoughts. Such an ability would have phenomenal prospects, not least for people unable to communicate as a result of brain damage. But it would also carry profoundly worrisome implications for the future of privacy.

The first scribbled records of electrical activity in the human brain were made in 1924 by a German doctor called Hans Berger using his new invention — the electroencephalogram (EEG). This uses electrodes placed on the skull to read the output of the brain's billions of nerve cells or neurons. By the mid-1990s, the ability to translate the brain's activity into readable signals had advanced so far that people could move computer cursors using only the electrical fields created by their thoughts.

The electrical impulses are produced in a part of the brain called the motor cortex, which is responsible for muscle movement. To move a cursor on a screen, you do not think 'move left' in natural language. Instead, you imagine a specific motion like hitting a ball with a tennis racket. Training the

machine to realize which electrical signals correspond to your imagined movements, however, is time consuming and difficult. And while this method works well for directing objects on a screen, its drawbacks become apparent when you try using it to communicate. At best, you can use the cursor to select letters displayed on an on-screen keyboard. Even a practiced mind would be lucky to write 15 words per minute with that approach. Speaking, we can manage 150.

Matching the speed at which we can think and talk would lead to devices that could instantly translate the electrical signals of someone's inner voice into sound produced by a speech synthesizer. To do this, it is necessary to focus only on the signals coming from the brain areas that govern speech. However, real mind reading requires some way to intercept those signals before they hit the motor cortex. The translation of thoughts to language in the brain is an incredibly complex and largely mysterious process, but this much is known: before they end up in the motor cortex, thoughts destined to become spoken words pass through two 'staging areas' associated with the perception and expression of speech.

The first is called Wernicke's area, which deals with semantics — in this case, ideas based in meaning, which can include images, smells or emotional memories. Damage to Wernicke's area can result in the loss of semantic associations: words can't make sense when they are decoupled from their meaning. Suffer a stroke in that region, for example, and you will have trouble understanding not just what others are telling you, but what you yourself are thinking.

The second is called Broca's area, agreed to be the brain's speech-processing center. Here, semantics are translated into phonetics and ultimately, word components. From here, the assembled sentences take a quick trip to the motor cortex, which activates the muscles that will turn the desired words into speech. Injure Broca's area, and though you might know what you want to say, you just can't send those impulses. When you listen to your inner voice, two things are happening. You 'hear' yourself producing language in Wernicke's area as you construct it in Broca's area. The key to mind reading seems to lie in these two areas.

(line 44) The work of Bradley Greger in 2010 broke new ground by marking the first-ever excursion beyond the motor cortex into the brain's language centers. His team used electrodes placed inside the skull to detect the electrical signatures of whole words, such as 'yes', 'no', 'hot', 'cold', 'thirsty', 'hungry', etc. Promising as it is. This approach requires a new signal to be learned for each new word. English contains a quarter of a million distinct words. And though this was the first instance of monitoring Wernicke's area, it still relied largely on the facial motor cortex. Greger decided there might be another way. The building blocks of language are called phonemes, and the English language has about 40 of them — the 'kuh' sound in 'school', for example, the'$h' in 'shy'. Every English word contains some subset of these components. Decode the brain signals that correspond to the phonemes, and you would have a system to unlock any word at the moment someone thinks it.

In 2011, Eric Leuthardt and his colleague Gerwin Schalk positioned electrodes over the language regions of four fully conscious people and were able to detect the phonemes ’oo’, ‘ah’, ‘eh’ and ‘ee’. What they also discovered was that spoken phonemes activated both the language areas and the motor cortex, while imagined speech — that inner voice — boosted the activity of neurons in Wernike’s area. Leuthardt had effectively read his subjects' minds. ‘I would call it brain reading,’ he says. To arrive at whole words, Leuthardt’s next step is to expand his library of sounds and to find out how the production of phonemes translates across different languages.

For now, the research is primarily aimed at improving the lives of people with locked-in syndrome, but the ability to explore the brain’s language centers could revolutionize other fields. The consequences of these findings could ripple out to more general audiences who might like to use extreme hands-free mobile communication technologies that can be manipulated by inner voice alone. For linguists, it could provide previously unobtainable insight into the neural origins and structures of language. Knowing what someone is thinking without needing words at all would be functionally indistinguishable from telepathy.

15. ***Do the following statements agree with the claims of the text writer? There are three possible options (YES, NO, NOT GIVEN). Choose one option. Discuss your opinions with your groupmates.***

YES — if the statement agrees with the views of the writer;

NO — if the statement contradicts the views of the writer;

NOT GIVEN — if it is impossible to say what the writer thinks about this.

1. Our inner voice can sometimes distract us when we are reading or writing.
2. The possibility of reading minds has both positive and negative implications.
3. Little progress was made in understanding electrical activity in the brain between 1924 and the mid-1990s.
4. Machines can be readily trained to interpret electrical signals from the brain that correspond to movements on a keyboard.
5. Much has been written about the potential use of speech synthesizers with paralyzed patients.
6. It has been proven that the perception and expression of speech occur in different parts of the brain.

16. ***Answer the following questions to the text from Exercise 14.***

1. What does the underlined phrase 'broke new ground’ in line 44 mean?
   a. built on the work of others.
   b. produced unusual or unexpected results.
   c. proved earlier theories on the subject to be false.

d. achieved something that had not been done before.

2. What was most significant about Leuthardt and Schalk's work?

a. They succeeded in grouping certain phonemes into words.
b. They linked the production of phonemes to recognizable brain activity.
c. Their methods worked for speakers of languages other than English.
d. Their subjects were awake during the course of their experiments.

3. What does the writer conclude about mind reading?

a. It could become a form of entertainment.
b. It may contribute to studies on language acquisition.
c. Most people are keenly awaiting the possibility of doing it.
d. Mobile technologies may become unreliable because of it.

4. What is the main purpose of the writer of this passage?

a. To give an account of the developments in mind-reading research.
b. To show how scientists' attitudes towards mind reading have changed.
c. To explain why mind-reading research should be given more funding.
d. To fully explore the arguments for and against mind reading.

4. PAST AND PRESENT

17. ***Read the text and answer the questions below it.***

An Introduction to Digital Signals

Signals of any kind are a way to deliver a message to a destination. When digital signals transmit information, they do so by turning signals into code. This is binary code, which is very specific and easily quantified. When that code is sent via wave pulses, the transmission of the signal is very reliable. What makes this so reliable is the fact that digital signals are actually quite resistant to outside noise disturbances. While other kinds of communication will almost always be transmitted along with some kind of undesirable noise (making a recording much harder to hear), digital signals can be encoded and sent without too much outside interference. One of today's commonly used devices made the switch from analog to digital signaling within the last 20 years. You might know it as the black box.

Component One of Black Box: the CVR

Many have heard of "the black box," a device used for recording what happens during an airplane's flight. What most people don't know is that the black box is really a common term for two pieces of recording equipment that are onboard every commercial and corporate airplane. The first is

called a cockpit voice recorder, or CVR. The CVR is attached to multiple microphones located in the cockpit and it records any communication and all the sounds in the cockpit. In the case of an accident, the investigators who listen to a CVR recording can actually hear two things: first, what was said by the pilots and/or crew right before the incident; and second, the sounds in the background. Well-trained investigators can detect unusual engine noise, strange pops and other signals that help alert them to figure out what went wrong with the flight.

Component Two of the Black Box: the FDR

The second part of the so-called black box is the flight data recorder, or FDR. This piece of equipment does not record the people onboard, but all technical aspects of a flight. Sensors all over the plane detect and send information to a flight data acquisition unit which, in turn, is hooked up to the FDR. The FDR is usually attached to the plane's tail, where it's least likely to be damaged in case of an accident. In the U.S., the Federal Aviation Administration requires FDRs to record at least 88 parameters, or aspects, of a commercial flight. As a few examples, these parameters can include the time, altitude, airspeed, direction, movement of the flaps on the wings, the flow of fuel, and use of autopilot. Then, in case something happens, investigators can use this information to recreate a simulation of the entire flight, from takeoff to the incident. In conjunction with the information from the cockpit voice recorder, they can get a picture of what happened.

The Origins of the Black Box

Making a recording of some aspect of a flight began with the beginning of flight itself. The Wright brothers, who created the first airplane, actually used a device to record their propeller rotations. (Think of it as the very first FDR, except that it only recorded a single kind of data!) Some basic recording devices were invented and used during the 1930s and during World War II, but they weren't commonplace. It was two decades later that aviation recorders began to become more widespread. The modern day black box is credited as an invention by an Australian scientist, Dr. David Warren.

Warren came up with the idea that multiple aspects of all flights should be recorded while he was working at the Aeronautical Research Laboratory in Melbourne. He was helping investigate an accident by the world's first jet-powered commercial aircraft, the Comet. Without any kind of recording, the crash was a total mystery to him and his co-investigators. He demonstrated the first basic flight data recorder in 1957. It was called a "red egg" for its shape and color. The red egg was fireproof and shockproof. It could reliably record both a plane's instrument readers and the pilots' voices, using only one wire. It also included a device to then decode all this information back on the ground. The red egg wasn't put into widespread use immediately. In 1960, however, there was another unexplained plane crash in Australia; this time in Queensland. After that, Australia became the first country in the world to mandate that the device be used on all commercial aircraft.

The Modern-Day Black Box

The black box is now used on all commercial aircraft and corporate jets. It's unclear exactly where the term came from, but it's possible it came from something a journalist told Dr. Warren about his red egg. Supposedly, he said, "this is a wonderful black box." At any rate, the phrase doesn't refer to the black box's color — the equipment is actually painted bright orange, in order to make it easier to find. The modern device is used around the world and is highly regulated. International standards mandate that it be able to withstand high acceleration and deceleration, high and low temperature fires, deep sea pressure, submersion in seawater or other liquids, and high impact and being crushed.

Why Digital Signaling is Important to the Black Box

Beginning in the 1990s, the technology employed by the black box was greatly improved. Newer black boxes were being built with solid state memory boards, which use memory chips to record and store information. This digital system is an improvement over the original system, magnetic tape technology, for several reasons. First off, magnetic tape needs to be pulled across an electromagnetic head. Solid state technology, however, has no moving parts making it both more reliable as an encoder of information and less likely to break. Second, the original cockpit voice recorder could only hold about a half-hour of information. It would record in a loop, recording over every half-hour, so the last half-hour of a flight was all investigators could hear. With solid state technology, the CVR can record up to two hours, which provides much more information. Furthermore, the flight data recorder can hold up to 25 hours using solid state technology.

Solid state memory boards are also better than magnetic tape technology concerning what the flight data recorder can record. While the old technology was able to record up to 100 different aspects or parameters of a flight, solid state technology records up to 700. What has remained the same, from one technology to the next, is the way the black box is powered. Both types draw energy from two generators which are powered by the plane's engines. The black box records and provides a huge amount of information. However, its technology helps determine how quickly investigators can analyze and use that information. In the case of an investigation, it can take weeks, even months, for investigators to download all the information from black boxes still using magnetic tape technology. And that's before they can even start studying and processing what happened! Using digitally equipped black boxes, however, they're able to download all the information from a flight in a matter of minutes. What a vast improvement! Black box manufacturers have made a complete switch to digital signaling from the old analog ways, and no longer make the magnetic tape recorders.

Questions

1. How does the black box on an airplane record information about the flight?
   a. It videotapes the passengers.
   b. It uses microphones in the cockpit and sensors all over the plane.

c. It uses close circuit television transmissions.

d. Flight attendants enter information manually into a computer in the box.

2. The passage explains that the solid-state technology is an improvement over the magnetic tape technology. What was one problem with black boxes using magnetic tape technology?

a. The color of the boxes made them difficult to find after an accident.

b. The tapes could get damaged if passengers had magnets on the plane.

c. The tapes could break as they were stretched across a machine to be read.

d. The tapes did not provide clear video images.

3. Solid state memory boards are more reliable than magnetic tapes for recording and transmitting flight information. Which evidence from the text supports this conclusion?

a. Solid state technology records more data than magnetic tape technology.

b. Solid state memory boards use memory chips to record and store information.

c. The black box draws energy from two generators that are powered by the plane's engines.

d. Information recorded on solid state technology can be downloaded in minutes.

4. Which of the following conclusions about flight recordings is supported by the text?

a. The most reliable methods for recording flight data are the oldest ones.

b. Experts began to record flight information only recently.

c. It is critical to get the most reliable data from flight recordings when investigating airplane accidents.

d. Digitized black boxes record flight information more effectively because they use more generators than the older ones.

5. What is the main idea of this passage?

a. Airplanes should record information when they are in flight.

b. The Wright Brothers created flight recorders when they invented the airplane.

c. Digitized signals are a vast improvement over magnetic tapes in black box recorders.

d. Colorful flight recording devices are easier to find than black ones.

6. Choose the answer that best completes the sentence "Solid state technology has no moving parts; _____, it is more reliable as an encoder of information and less likely to break."

a. however

b. therefore

c. but

d. otherwise

7. Why are digital signals more reliable than magnetic tapes in recording and transmitting information during a flight? (an open answer)

8. It is important to get information about a flight from many parts of the airplane. What evidence

from the text supports this conclusion? (an open answer)

9. How have improvements in black box technology impacted the investigation process of aircraft? Use information from the passage to support your answer. (an open answer)

18*. *Fill in the gaps with the appropriate words from the list.*

linking, regulate, potential, ensure, inappropriateness, criteria, impact, seek, construction, compensation, technological, contributor, shifting, maintain, registration, elementary, community, tradition.

1. Libya has long been a crossroads, _____ three continents. 2. _____ for fall programs begins on August first. 3. Eating plenty of fruits, vegetables, protein and dairy products will _____ your body gets the minerals it needs. 4. He received almost half a million dollars in _____ after an accident in which the brakes on his new car failed. 5. Potential immigrants to this country are evaluated using a point system which examines _____ such as age, health, work skills, and education. 6. The discoveries of Albert Einstein began a _____ revolution that has generated more change in a century than in the previous two thousand years. 7. Studies by Gradman and Hanania have shown that regular out of class reading is the most important direct _____ to success on the TOEFL test. 8. The _____ sands of the desert in some parts of Egypt can make for a difficult and dangerous crossing. 9. I would _____ a second opinion if you don't agree with what your doctor said. 10. The number and kind of animals and plants making up a lake _____ changes continuously. 11. Setting off fireworks on Halloween is a popular _____ in this country. 12. In the future, we may have tiny computers inside us to monitor, and even _____ functions such as heart rate or blood pressure. 13. I can't understand why they hired him to work in the computer lab; at best, he has only very _____ knowledge of computers. 14. European diseases had a devastating _____ on the native people of Guatemala. 15. My uncle works in _____ as an electrician. 16. The _____ of his language continually causes great embarrassment at our weekly staff meetings. 17. Ensuring that a child's basic needs are met helps to enable them to reach their full _____. 18. One of the goals of the United Nations is to _____ international peace and security.

WRITING

19. *Translate one paragraph from the following text in the written form paying attention to its grammar, lexical, and stylistic peculiarities.*

Iranians Turn to Telegram App Amid Protests

Nearly a decade ago, a then-fledgling internet tool played a starring role in a protest movement that swept Iran, with organizers and witnesses communicating with each other, and the rest of the world, via Twitter. Today, a loose-knit group of Iranian protesters has added a new tool: Telegram, a smartphone messaging app that people have used to share information about demonstrations and videos of gatherings. “Telegram has been the most important tool for many Iranians to access uncensored news and information,” said Fereidoon Bashar co-director of ASL19, a Canada-based research and tech lab that helps people in Iran access information. Sharing news and information has become important during the protests, which have evolved without centralized leadership, Mr. Bashar said. Iranians’ use of social media to facilitate protests, and the government’s efforts to block them, represent the latest moves in a cat-and-mouse game that has played out in several countries in recent years.

The Iranian government has moved to rein in protesters’ ability to organize and communicate. It is restricting access to Telegram and Instagram, the photo-sharing site owned by Facebook Inc., state media has reported. The semi-official Iranian Labor News Agency reported over the weekend that authorities had ordered blockages of mobile and landline internet access in areas near protests or anti-government gatherings. In response, Iranians have ramped up their use of circumvention tools to allow apps like Telegram to function, according to activists and developers of the tools. State Department spokeswoman Heather Nauert said the U.S. is calling on Iran to stop blocking social-media sites and to respect the rights of protesters to speak freely in public and online. “When a nation clamps down on social media … we ask the question, ‘What are you afraid of?” she said.

Telegram’s chief executive, Pavel Durov, said in a statement over the weekend that the government was blocking access to Telegram for the majority of Iranians. He said the move came after the company refused to shut down channels in which protesters posted information about gatherings, including one that was giving times and places for protests and distributing videos of unrest. He said Telegram shut down one channel that violated Telegram’s rules against calls for violence. Mr. Durov and a Telegram spokesman didn’t respond to requests for comment on Tuesday. A spokesman for Instagram declined to comment. An Iranian government representative didn’t respond immediately to a request for comment. Access to uncensored communication tools —including Twitter Inc.’s service — helped fuel the protests that swept Iran in 2009, by allowing protesters to share news and organize gatherings using services outside government control. Protesters used Twitter, Facebook and other new platforms during the Arab Spring uprisings that erupted in 2011. Since then, Iran and other countries including China, Turkey and Russia have increased their efforts to police the internet. In many cases, they use technological filters — similar to those companies make to thwart cyberattacks - to spot and censor traffic they don’t like.

Those filters have led to a technical arms race. Governments make or buy subtler and more effective filters. Activists and protesters use an evolving set of technologies to redirect or obfuscate

their internet traffic and thereby sidestep the blockades. Telegram has become a favourite because of its perceived privacy. It is a messaging app, similar to Facebook-owned WhatsApp, that can be used on a smartphone or computer. It touts its speed and security; users can set messages to self-destruct on its "secret chat" feature. Using this function, Telegram users can choose to have messages encrypted, so even Telegram doesn't have access to the data. Non-"secret chat" messages are essentially split up and stored on Telegram servers throughout the world. Telegram says it would take court orders from several countries to force the company to give up data. In addition to sending messages to individuals and groups, users can create or join "channels" to broadcast to large audiences.

Telegram has come under fire in the U.S. and Europe, where authorities have accused it of helping disseminate terrorist propaganda, as well as allowing encrypted communication between terrorists. Telegram has said that banning encrypted messages to deter terrorism wouldn't work because extremists would find other ways to covertly communicate. Mr. Durov, Telegram's 33-year-old founder and owner, has marketed his privately held company to people suspicious of governments. He founded Russia's equivalent of Facebook, VKontakte, but left Russia after government pressure. He started Telegram in 2013. Telegram, which is free, doesn't sell ads and says it isn't interested in making a profit. The company says it is supported by Mr. Durov's personal money. In a 2016 interview, Mr. Durov said he and a small group of Telegram programmers didn't have a permanent home in part because they didn't want to be beholden to one country's regulations. He said they rented accommodations in a city for weeks at a time before moving onto another. Recent homes had included Barcelona, Berlin, and London.

20. ***Write a personal letter to your friend living abroad on one of the following topics "How I took part in an academic activity or event"; "How is scientific knowledge changing nowadays?". Write at least 250 words.***

SELF-STUDY ACTIVITIES

21. ***Fill in the gaps with the correct form of the verbs in brackets: past simple, present perfect.***

1. We _____*(be)* informed that you are an expert in the field. 2. Since my last email to you I _____ *(ascertain)* that… 3. John _____ *(phone)* and _____ *(say)* that… 4. Lara Fortress _____ *(call)* this morning. 5. Sorry for the delay in getting back to you but I _____ *(be)* out of the office last week. 6. For some reason my last email _____ *(have)* delivery problems. So, here it is again just in case you _____ *(get)* it first time round. 7. Sorry I accidentally _____ *(hit)* the send button. 8. OK, I'm sorry. You are right. I _____ *(misunderstand)* what you were saying.

22. ***Fill in the gaps with the correct form of the verbs in brackets: past simple, past continuous.***

1. Overall, a preference for symmetry _____ *(be)* more marked when females _____ *(assess)* male faces rather than female faces. 2. The study shows that the assistants who _____ *(plan)*to leave their present employment within the next three months _____ *(be)* better educated than those who _____ *(plan)* to stay. 3. Analysis on whether a helmet was _____ *(wear)* at the time of the accident _____ *(show)* that no fractures _____ (*occur)* in the six instances when a helmet _____ *(wear)*. 4. Most of the patients _____ *(treat)* with no other medications, except for five who _____ *(receive)* hypnotics. Written informed consent _____ *(obtain)* from all subjects. 5. Questionnaires _____ *(administer)* to international travelers departing from Heathrow Airport and who _____ *(go)* to destinations that were high risk for malaria. 6. In the late 1990s, Rupert Burgess _____ *(work)* on robotics at the University of Manchester, while I _____ *(work)* on neo-androids at the University of Sussex. This shared interest _____ (*lead)* to our joint collaboration.

23. ***Fill in the gaps with the correct form of the verbs in brackets: future simple, future continuous.***

1. Interest in this technology is growing and managers _____ *(see)* many "success stories" in this field in the short term. 2. Future users _____ *(search)* for results which are orders of magnitude longer than those common today. It _____ *(be)* impractical to store the entire text string in the main memory. 3. You _____ *(decide)* approximately in what year each text was written. 4. This year, approximately 10 million women _____ *(turn)* 50, at a rate of 5,000 per day. Based on the age incidence data for breast cancer, within the next 10 years 269,000 women per year _____ *(be)* afflicted with breast cancer. 5. This is going to have major implications for the way languages _____ *(be)* taught. 6. At a time when more and more people _____ (*need)* to communicate in a language other than English, the pool of teachers who can teach these languages _____ *(shrink)*. 7. At any time, 3 in 20 of such patients _____ *(suffer)* from depression. 8. Future work _____ *(investigate)* how to prevent these accidents from happening.

24*. ***Fill in the gaps with the most appropriate words from the list.***

primarily, site, re-evaluate, corporations, constantly, credited, technically, obtain, dominant, sequential, negative, institution, unachievable, circumstances, computes, published, assists, residing, illustration, justifiably

1. He was arrested by police in the act of trying to _____ a false passport. 2. Our brain _____

millions of bits of information every second of every day. 3. A human-looking robot which _____ the elderly with daily chores has recently been developed in Japan. 4. My bank has _____ my account with the amount that was mistakenly charged to us without reason. 5. The dream of peace in the Middle East sometimes seems completely _____ given the current poor state of relations between countries in the region. 6. This magazine is _____ aimed at adolescent girls. 7. Liona spent the summer working at an archaeological _____ in the northern part of the province. 8. The downturn in the economy has forced us to _____ our investment goals. 9. Sociologists consider the family to be the most basic social _____ 10. He is from England, but is currently _____ in Australia. 11. 2001 was the first whole year of _____ growth in the economy of Taiwan since 1947. 12. Sophie did a nice _____ of a girl's face in colored pencils for her art class. 13. Studies show that 70% of the world's coffee market is controlled by just four multinational _____. 14. Much evidence exists suggesting that the seafloors are _____ moving, and continually being created and destroyed. 15. Poland was the _____ political power in eastern Europe from the fourteenth to the seventeenth century. 16. These ten photos are _____, and were taken over a 10-day period. 17. In 1507, the first map of the Earth was _____ showing the Western Hemisphere. 18. Barry hasn't been doing a very good job at work lately, but I think we have to recognize that this is understandable, given the _____ of his wife's illness. 19. Steve was _____ angry when he found out he had been let go, just so the boss could hire his nephew. 20. Possession of marijuana is _____ illegal, but the police tend to ignore possession of small amounts of the drug.

25*. *Choose the correct option: deeply, strictly, strongly, tightly, thoroughly.*

1. When writing a user manual only give the information that is *strictly / strongly / tightly* necessary and use the simplest possible way to express any concept. 2. All samples were checked *deeply / strongly / thoroughly* for any possible form of contamination. 3. These two findings *deeply / strongly / tightly* suggest that formal language represents an easier element for translation than informal language. 4. Human advances during the twentieth century were *deeply / strongly / tightly* linked with an unprecedented rise in total energy consumption… 5. We find these results to be *deeply / strongly / thoroughly* disturbing and they *deeply / strongly / tightly* suggest that parents need to take more control over what websites their children have access to. 6. This topic has not been investigated *deeply / strongly / thoroughly*. Taken together, the data demonstrate that lipocalin 2 is *strictly / strongly / thoroughl***y** induced by TLR stimuli, and that it has an important function in innate defense against bacterial infections. 7. A / P is *deeply / strictly / strongly* dependent on the degree of oxidation, degradation and polymerization. 18. After analyzing all the results *strictly / strongly / thoroughly*, we conclude that this polymerase is *deeply / tightly / thoroughly* bound to the nuclear matrix.

26. ***Read the text and answer the questions below it.***

Short Circuits

We all know that technological progress is not an actual magic show. Still, it almost seems like magic the way the transistor, the main component in all modern electronics, has diminished in size since being invented in 1947. The first transistor, made of gold, plastic, and germanium, was about the size of an adult's fingernail. Today's transistors, etched on silicon wafers, can't be seen with the naked eye. The minimum size of a transistor is now 45 nanometers. A nanometer is one-billionth of a meter - roughly the width of three or four atoms. Computer engineers are trying to make transistors even smaller. How tiny can they go?

Chip Switches

Every transistor has the same basic properties: It can both conduct and stop the flow of electricity. The word transistor is a combination of two words: transfer and resistor. All transistors are made from materials called semiconductors. A semiconductor is a cross between a good conductor (such as copper) and a good insulator (such as rubber). It can be made to accept or reject the flow of electrons in a circuit. Germanium, used in the first transistors, is a semiconductor. So is silicon, widely used today. A transistor's ability to control the flow of electricity has made possible our entire computerized world. All computers depend on the binary system to convert electric signals into useful information. The binary system has only two numbers: 1 and 0. When a transistor allows electricity to flow through, it registers a 1. When the transistor stops the flow of electrons, it registers a 0. Millions or billions of those 1s and 0s, flashing off and on hundreds of millions of times a second in programmed patterns, enable your computer to do everything it does — from allowing you to play World of Warcraft to letting you type up a school science report.

Inner Limits

A transistor that is only a few atoms wide is incredibly small. But researchers want to make transistors even smaller and cheaper to produce. Chip-making technology has run into a big problem, however. Transistors smaller than 45 nanometers and etched on silicon chips don't work very well. They tend to leak electrons, making them less efficient. To get around that problem, scientists are using nanotechnology to look at new materials and new methods to produce transistors. Nanotechnology is the engineering of materials on the atomic level, building new materials from the bottom up by manipulating atoms and molecules.

One promising area of nanotechnology is the use of graphene, a carbon fabric that is only one carbon atom thick. Graphene is strong, stable, and can act as a semiconductor. If researchers can find a practical way to etch transistors onto graphene, smaller and immensely faster computer chips can

be more cheaply made. “[The ultimate goal] of electronic engineers is the so-called ballistic transistor,” physicist Andre Geim, a graphene researcher at the University of Manchester, told Live Science. “It would be very, very fast, ultimately fast, in fact.” Another promising area of nanotechnology research involves using strands of deoxyribonucleic acid (DNA) to build transistors. DNA is the genetic material that determines the makeup of all living cells. Researchers can now take strands of DNA from bacteria and manipulate them into almost any shape they want. California Institute of Technology researcher Paul Rothemund has helped pioneer that technique. He has twisted DNA strands into smiley faces and maps of North and South America.

Rothemund and others are looking to shape DNA strands into a kind of scaffolding that could be attached to silicon wafers to make transistors. Because DNA does not conduct electricity, scientists are experimenting with ways to combine DNA with atoms of conducting materials, such as gold, to build transistors. DNA replicates (copies) itself. So, if researchers can produce a DNA transistor, all they have to do is add the right “soup” of chemicals, and the DNA would reproduce itself, making millions of new nano-sized transistors at little or no cost.

Smart Dust

Making transistors much smaller and much more cheaply could transform our lives. Tiny, smart nanomachines could do any number of things quickly and invisibly. Their greatest use might be in medicine. Swallowed in a pill or injected, tiny, computerized “nanobots” might be able to repair damaged cells one at a time, restoring health invisibly and painlessly before destroying themselves. The nanobots might repair pipes, bridges, airplane engines, and electrical equipment too. They might even help with housework. Kris Pister, a University of California physicist, envisions what he calls smart dust — nanobots that move around the house at night, eating dirt and generally cleaning up. Such things are possible in your lifetime — all because scientists are now “thinking small.”

Questions

1. When was the transistor invented?
    a. 1947
    b. 1945
    c. 2007
    d. 2000
2. How does the author describe the changes transistors have undergone over time?
    a. Transistors are used for the same things they were used for when first invented.
    b. Transistors haven’t changed much since they were invented.
    c. Transistors have shrunk in size and become less useful.
    d. Transistors have shrunk in size but increased in usefulness.
3. How do you think the author feels about the future of transistors and nanotechnology?

a. Hopeful and excited.
b. Concerned and worried.
c. Cautious and uncertain.
d. Too little information to determine.

4. This passage is mostly about …
   a. technology
   b. nanotechnology
   c. transistors
   d. science

5. How are today's transistors different from the first ones that were invented? (an open answer)

6. What does the author mean by the use of the word "soup"? (an open answer)

7. The question below is an incomplete sentence. Choose the word that best completes the sentence. If scientists can figure out how to etch transistors onto graphene, _____ they will be able to create much smaller and much faster computer chips.
   a. but
   b. then
   c. so
   d. however

27. ***Choose a scientific article in English concerning your own field of science from any valid information source (10 000 printed characters) and prepare its oral translation into Russian.***

28. ***Search the Internet and go to the libraries to find scientific and technical articles on the topics of Module 2. Analyze the gathered material, then prepare a 10-minute report on the chosen topic. Give a Power Point presentation in the group (see Appendix 1).***

MODULE TEST 2

Variant 1

1. ***Choose the best option: present simple, present continuous, present perfect, present perfect continuous.***

1. In the last few years there *is / has been* considerable interest in… 2. At the moment, I *am working / have been working* on a new project. 3. For more than a decade analysts *are developing / have been*

developing new ways to improve learning strategies. 4. In the literature, there *are / have been* several examples of new strategies to perform these tests, which all *entail / have entailed* setting new parameters. 5. Since 2017 there *are / have been* many attempts to establish an index, but until now no one *has managed / has been managing* to solve the issue of… 6. As yet, a solution *is not / has not been* found, although three attempts *have been made / have been making*. 7. Traditionally, researchers *always see / have always seen* the time factor as a constraint. 8. In the last two years, we *are investigating / have been investigating* new ways to do this. 9. This *receives / has received* much attention in the past decade. 10. Recent developments in this field *lead / have led* researchers to consider new ways to do this. Such methods *are showing / have been shown* very good results.

2. *Fill in the gaps with the appropriate words from the list.*

components, validate, philosophy, excluded, reliable, convened, initiate, locations, deduced, specific.

1. The prime minister has _____ a meeting of cabinet to discuss new policy initiatives. 2. The movie is being filmed in a number of different _____ in and around Vancouver. 3. Skills in organizing and integrating information are important _____ of thinking critically. 4. Psychologists say that we like others who share our beliefs and attitudes because they _____ these values, which further convinces us that our values are the best ones. 5. My partner and I share a common business _____, but our specific ideas for achieving our goals are somewhat different. 6. Western women are not encouraged to _____ a handshake with men in India, as it is not customary. 7. In the early Christian church, instrumental music was _____ from public worship because it was not seen to open the mind to Christian teachings. 8. You can depend on Donald to be on time because he's so _____. 9. This dictionary is not made for any _____ language level; it can be used by anyone studying English, from the beginner to the advanced learner. 10. I _____ they were a having a love affair by studying their body language at the company Christmas party.

3. *Read the text and answer the questions below it.*

The Hoover Dam

Hydropower is energy generated by a process that uses running or falling water. Mankind has used it for centuries. Around the globe during more primitive times, man used hydropower for irrigation of crops located miles around local water sources. Later, hydropower was used to energize mills that manufactured all sorts of things from paper to paint. These days, hydropower is looked to for the generation of electricity more than any other type of energy, so it is now often referred to as "hydroelectric power." Hydropower has both positive and negative effects. If one were to try and find a perfect example of what hydropower can do for society, both positive and negative, they would need

to look no further than the border between the states of Nevada and Arizona in the United States of America. There, they would find one of the most iconic and recognizable structures in the entire country. There, they would find the Hoover Dam.

For decades, the people of the United States of America knew that the Colorado River would be a tremendously useful resource. The Colorado River was used to irrigate farmlands for miles, which brought thousands upon thousands of settlers to the Southwest region. At the turn of the twentieth century though, the government became aware of the many technological improvements being made in the world of hydropower. It had been used famously to power steamboats, but these new developments were making it easier for hydropower to be used to generate electricity. With the invention of the light bulb in 1879, it was just a matter of time before electricity, especially amounts generated by hydropower, would become incredibly important in people's day-to-day lives. It didn't take much time either! In Wisconsin, just three years after the light bulb was invented, the first hydroelectric plant opened, proving that the technology in the field of hydropower was being updated rapidly. Therefore, by 1900, the United States felt that action should be taken in the Southwest in order to capitalize on the availability of these new advances, while improving life for both present and future settlers that were moving westward. It took quite a while for the outlining of formal plans for a new dam in that area to be agreed upon. For almost thirty years, there were disagreements on where the dam should be built and how it should be built. However, during that time, the technology only improved. In a way, then, the delays only helped create a more outstanding final product. Finally, in 1928, President Coolidge approved the building of what would become the Hoover Dam. More planning took place that spanned three additional years. It was decided that the dam would be 726 feet tall, 1200 feet wide at its crest, and 660 feet thick at its base. 6.6 million tons of concrete would be needed then for the 91.8 billion cubic-foot facing. Finally, in 1931 President Herbert Hoover, the man which the dam would eventually be named after, ordered that the work begin on the $40 million project, which, in 2013, would now cost in excess of $700 million.

Thirty-five miles north of the dam site in the state of Nevada was a small city called Las Vegas. Once word got out that the tremendous new dam would be built at the Nevada-Arizona border, tens of thousands unemployed workers who were suffering through some of the peak years of The Great Depression flocked to the nearby city and its population quadrupled almost instantly. Though the working conditions were extremely difficult due to high summer temperatures (sixteen people died in just one month from heat stroke), the new Las Vegas citizens were desperate to take any work they could get. Employment for the dam peaked at over 5,000 workers being paid at one time in 1934. By the time the Hoover Dam was completed two years later, 112 people had died during its construction, while many more fell ill from pneumonia caused by the working conditions over the course of the months and years to come. Some of those cases resulted in unfortunate fatalities as well. A memorial

tribute to the workers who lost their lives rests on the dam site with the inscription: “They died to make the desert bloom.” And bloom it did.

The Hoover Dam has many functions with one of them being irrigation. One million acres of land around the dam and the All-American Canal, which has water fed to it from the Hoover Dam, are irrigated because of the manmade colossus and the hydropower it produces. Irrigation is incredibly important to the survival of the species of man. One-third of all food in the world that is produced comes from irrigated lands. Obviously, the Hoover Dam is quite helpful in that regard. The Hoover Dam not only provides water to crops, but also to people. Lake Mead is a nearby lake that is the largest reservoir in the United States. It’s a manmade lake that, like the All-American Canal, gets its water from what is collected at the dam. Lake Mead has a surface area of 247 square miles and services eight million people with water in Arizona, Nevada, and California. Because so much water moves through the Hoover Dam and into the All-American Canal and Lake Mead, potential floods are also kept under control, making local areas much safer and less susceptible to flooding than in the days before the Hoover Dam.

Still, the biggest reason the Hoover Dam exists is its ability to provide electricity for people in the outlying areas. Each year, the dam generates an average of 4.2 billion kilowatt-hours of electricity. A kilowatt-hour is the energy it takes for a kilowatt to work for one hour. This kind of power is potent enough for the roughly one million people who use electricity from the Hoover Dam to enjoy it. The Hoover Dam has been a key factor in the development of major American cities like Las Vegas and Los Angeles because of the availability of electricity it provides to those sections of the Southwestern states of the U.S.

Safety to people in the surrounding areas and cleanliness are two of the main reasons why hydropower would be a favored source of energy over others. Once oil burns off after use, like in an automobile, toxic gases and contaminants are thrown into the air, polluting the atmosphere. Coal has a similar, dirty impact. Though nuclear power is also very clean, as well as cost-efficient, there are massive risks to people who live near nuclear power plants should something unfortunate occur at one. Atomic energy creates radiation, which is extremely hazardous if it is leaked into the environment. In general, nuclear power plant activity has not resulted in as many deaths as those associated with the generation of other types of power; however, there is a great risk that it could. Hydropower creates very few gaseous emissions. Safety at the Hoover Dam is a top priority as the workers there constantly inspect the dam for damage. There have been very few incidents since the dam opened nearly eighty years ago.

Even though there clearly are numerous advantages to the activation of the Hoover Dam and the work done at the site, there are a few environmental impacts that are harsh. Local ecosystems have declined as a result of water being used up by the Dam and its emptying into the Lake Mead

reservoir. The water levels in the Colorado River have been reduced. Plant life then in the immediate area has suffered because the plants have difficulty growing roots long enough to find drinking water. Therefore, they have been sacrificed so that crops abroad could flourish. The dam has impacted the temperatures of the water in the Colorado River. Certain fish that can only survive in particular water temperatures have been almost completely wiped out, including four species of fish that have since been placed on the Endangered Species list. The turbines that draw in the water and use it to help transform energy also draw in fish that are killed from time to time as well. Scientists and engineers have been working to address these environmental issues for years. Progress has been made as they have invented "fish friendly" turbines that allow fish to pass through them unharmed.

There is widespread awareness of these problems, but, clearly, a majority of legislators agree that the benefits of the Hoover Dam greatly outweigh the negatives. President Barack Obama signed extensions allowing the operations of The Hoover Dam to continue through at least the year 2067. The people of the Southwest region of the United States will be able to enjoy the benefits that the Hoover Dam provides them: food, water, and electricity. On top of all of that, the local economy will also benefit, due to tourism, with over ten million people taking in the boating and sun of Lake Mead and seven million people visiting the dam each year.

Questions

1. What is hydro-electric power?
    a. A form of hydropower that is no longer used to generate electricity.
    b. A form of hydropower that uses running water to generate electricity.
    c. A form of hydropower that uses electricity to move water.
    d. A form of hydropower that uses electricity to build dams.
2. What does the author describe in the passage?
    a. The history of the Hoover Dam and its impact on the Southwest region.
    b. The development of different types of hydropower.
    c. The political environment in America during the construction of the Hoover Dam.
    d. Improvements in irrigation along the Colorado River before the Hoover Dam was built.
3. The Hoover Dam provides water to crops and people, keeps potential floods under control, and generates electricity for people in the outlying areas. Based on this evidence, it can be concluded that the Hoover Dam …
    a. has had a negative impact on the environment of the Southwest region.
    b. has had a negative impact on the people living in the Southwest region.
    c. has had more than one positive impact on the Southwest region.
    d. has had only one positive impact on the Southwest region.
4. Based on the passage, the benefits of the Hoover Dam …

a. are limited to humans.
b. are limited to the environment.
c. are decreasing over time as the dam becomes old.
d. are greater than the negative results of the dam.

5. This passage is mostly about …

a. the Hoover Dam and the impact hydropower can have on a region.
b. why different politicians are in favor of extending the operations of the Hoover Dam.
c. the advantages of using hydropower over other sources of energy.
d. the effects the Hoover Dam has had on the environment.

6. Read the sentences given in the second paragraph: "In Wisconsin, just three years after … future settlers that were moving westward." What word or phrase could best replace capitalize on as used in the sentence?

a. take advantage of
b. make money off of
c. eliminate
d. block from future use

Variant 2

1. *Choose the best option: past simple, present perfect simple, present perfect continuous.*

1. As mentioned on the telephone to your administrative secretary, I would be interested in an internship in your laboratory. I *graduated / have graduated* in Computer Science from the University of Oregon in 2017, and *obtained / have obtained* a Master's degree in Applied Neurolinguistics the following year in Berlin. 2. I then *worked / have worked* on two major projects using neural networks. 3. The first one *was / has been* based in Shanghai and the second in Beijing. 4. I am now back at the University of Oregon where for the last three months I *was / have been* an assistant professor. 5. So far, I *designed / have designed* three different software applications, and I am currently working on a natural language system for vending machines. 6. Over the last three years I *also gained / have also gained* considerable experience in other aspects of language engineering as 7. I *attended / have attended* several congresses on such areas as artificial intelligence, language engineering standards, and logic programming. 8. I also *have been giving / have given* a series of workshops on these subjects here in Oregon, the last of which will be held at the end of this month. 9. My native language is Chinese, but I also speak fluent German as I *was doing / have done* a language course while I *was / have been* in Berlin for my Master's. 10. I *spent / have spent* a considerable amount of time here in the USA, so English is basically my second language.

2. *Fill in the gaps with the appropriate words from the list.*

transferal, consumption, aspect, selecting, previous, complexities, equate, uninjured, irrelevant, normalizes.

1. It is difficult to discuss the _____ of differing political philosophies in a short news clip. 2. You can't always _____ success with how much money a person has. There's more to life than that. 3. One of the most important steps in learning a second language is _____ the course of study that's right for you. 4. Studies show that constant exposure to media content _____ violence, with the result that children come to believe that society is violent. 5. Two of the people in the car accident were seriously hurt, but the third passenger was totally _____. 6. The _____ of funds from one account to another will take 24 hours. 7. The average daily _____ of salt in this country is much higher than recommended. 8. Schmitt and McCarthy have stated that vocabulary is now regarded as the key _____ of learning a second language. 9. In September of 1996, American rap star Tupac Shakur died from gunshot wounds he received the _____ week. 10. Your summary has too many _____ details; you need to make it much more concise.

3. *Read the text and answer the questions below it.*

The Most Expensive House in the Universe

Do you know where the most expensive house in the universe is located? Some might guess Hollywood, where some of the richest and most famous movie stars have their homes. Others might think of New York City, where a one-bedroom apartment in Manhattan can cost more than a mansion in the suburbs. But they would all be wrong, because this is a trick question. The most expensive house isn't even properly located on Earth. It's the International Space Station (ISS), which is circling in orbit above us right now. The cost to build this engineering marvel, which is roughly the size of a football field, is around 150 billion dollars.

Many different governments cooperated in order to plan and build the ISS, including the USA, Russia, Japan, Canada, and Europe. These entities decided to work together on the project only after developing plans independently for related space projects. By combining forces, they reasoned, they could split the cost of constructing a space station and also share resources while onboard the station. The countries envisioned three important purposes for their joint project: to support scientific research, to help astronauts continue to explore space, and to educate the public. Thus, the engineering criteria for the space station had to include facilities to support each of these important missions.

Construction began in 1998, after the countries decided to band together and merge their space

missions to create the ISS. Many countries used their spacecraft to deliver the parts for the ISS, little by little, into space. First came the operating systems and hardware. Then, two years later, a Russian rocket delivered the living quarters (complete with beds, toilets, and a kitchen) that would make the ISS habitable for humans. The first "residents" of the ISS — two Russian astronauts and one American — arrived on Expedition 1 in 2000. Over time, more space missions to the ISS added new parts to the space station, such as "docks" for incoming spacecraft that would make it easier for astronauts to come in and out of the station.

Throughout the construction of the ISS, which is partially solar-powered, engineers had to think constantly about the best way to keep the ISS running. They had to build and position the station's parts so that the space station could be powered by light from the sun. They also had to think about ways to protect it from meteoroids (including installing strong shutters on its seven windows). They installed robotic "arms" for the space station that could grab and hold both ships and astronauts securely while docking. And they had to install features that would make it easier to live for long stretches of time in space, such as exercise machines for the astronauts.

Astronauts can come and go on the ISS. They come to perform many of the experiments for which the station was designed, involving biology, physics, astronomy, and meteorology. Others test equipment to be used in missions to the moon and Mars. In a Japanese-built laboratory aboard the ISS called Kibo (which means "hope"), they can even grow plants and raise fish. However, most of the astronauts' space food is still delivered in sealed bags, and there isn't much variety. Thus, the crew aboard the ISS often looks forward to visiting shuttles that bring the astronauts fresh, different fruit to eat.

Life aboard the ISS has become relatively more comfortable thanks to technological improvements developed by engineers; however, it has not always been easy for the engineers back home to work on the space station. Space travel and construction of spacecraft are two of the most expensive projects a country can take on, and as the economies around the world shift, some countries have a harder time contributing financially.

Sometimes, engineers from different countries will disagree about the best way to build something. And while some people on the space station project think it's a good idea to charge money to space "tourists" in order to provide more funds for the project or to charge companies a lot of money to advertise their business on the rockets that fly to the ISS, others think that these ideas do not align with the original purposes of the ISS. But the fact is, no country or individual can afford the giant price tag for this important space "house" alone, so they must keep working together. And the results — whether they include important new scientific discoveries, easier and more frequent missions to Mars, or better cultural relations between our countries — are sure to benefit us.

Questions

1. According to the passage, where is “the most expensive house” located?
    a. on the surface of Mars
    b. Hollywood, CA
    c. circling above Earth
    d. New York City
2. Which of the following sequences shows the construction of the ISS in the correct order?
    a. Operating systems and hardware were built, then living quarters were delivered, then the first residents arrived, then docks for incoming spacecraft were added.
    b. Operating systems and hardware were built, then docks for incoming spacecraft were added, then living quarters were delivered, then the first residents arrived.
    c. Living quarters were built, then operating systems and hardware were delivered, then docks for incoming spacecraft were added, then the first residents arrived.
    d. Docks for incoming spacecraft were built, then living quarters were delivered, then operating systems and hardware were delivered, then the first residents arrived.

3. The countries that worked together to build the ISS did not originally plan to build a shared space station. What evidence from the passage best supports this conclusion?
    a. “Many different governments cooperated in order to plan and build the ISS, including the USA, Russia, Japan, Canada, and Europe.”
    b. “By combining forces, they reasoned, they could split the cost of constructing a space station, and also share resources while onboard the station.”
    c. “Many countries used their spacecraft to deliver the parts for the ISS, little by little, into space.”
    d. “These entities decided to work together on the project only after developing plans independently for related space projects.”
4. What has helped make the ISS mission successful so far?
    a. Money collected from space tourists.
    b. People from many countries working together.
    c. Competition between the United States and Russia.
    d. Money donated by America to pay for the ISS.
5. What is this passage mostly about?
    a. The construction and mission of the ISS.
    b. The most expensive houses in the world.
    c. How astronauts can live on this ISS.
    d. The financial cost of building the ISS.

Module 3

SCIENCE AND SOCIETY

Academic Word List: access, adequate, adjust, alter, amend, annual, apparent, approximate, attitude, attribute, aware, capacity, challenge, clause, commit, communicate, compound, concentrate, confer, cycle, decline, despite, dimension, discrete, domestic, draft, emerge, enable, enforce, entity, equivalent, error, ethnic, evolve, expand, expose, external, facilitate, generate, generation, goal, grant, hence, hypothesis, implement, implicate, impose, integrate, internal, investigate, license, margin, mental, modify, monitor, network, notion, objective, obvious, occupy, output, overall, perspective, precise, predict, prime, principal, prior, promote, pursue, ratio, reject, resolve, retain, revenue, series, stable, subsequent, substitute, summary, sustain, target, transit, undertake, welfare, whereas

GRAMMAR REVISION

Verb. Passive Forms

1. ***Rewrite these sentences. Instead of using 'people', 'somebody', or 'they', write a passive sentence with an appropriate verb form.***

Example: *We can solve the problem. = The problem can be solved.*

1. Someone had reported the theft to the police. 2. Someone has given £1,000 to the charity. 3. Someone will demonstrate the program to the students. 4. Someone explained the procedure to me. 5. People are destroying large areas of forest every day. 6. Somebody has bought the land next to the university. 7. I hope they will have completed all the marking by tomorrow. 8. They should have finished the library by the time you arrive. 9. People expect better results soon. 10. Students should send their complaints to the head of department. 11. They had to postpone the lecture because of illness. 12. An electrical fault could have caused the fire. 13. They are going to hold next year's conference in Birmingham. 14. Everyone knows this fact very well. 15. You must write the answers on the examination paper in black ink.

2. ***Active to Passive: Convert the following sentences into passive ones.***

Example: *This paper* ***considers*** *the advantages and disadvantages of a world court of justice. = In this paper the advantages and disadvantages of a world court of justice* ***are considered***.

1. In this paper, we address the need to promote awareness. 2. We summarize the latest developments in search engines. 3. This survey has highlighted the urgency of the situation. 4. This work aims to

find an alternative to school education. 5. We have not included details on this progress in this document. 6. In Section 4 we attempt to make some sense of these findings. 7. Future work will deal with this aspect. 8. One of the advantages of PCA analysis is that it enables one to classify new samples quickly.

3. ***Passive to Active: convert the following sentences into active ones.***

Example: *In the Methodology, it* ***is shown*** *how to follow the steps. = In the Methodology, we* ***show*** *how to follow the steps.*

1. All the relevant values are reported in Table 1.2. The results are shown in Figure 2. 3. This quantity was determined from the values in Table 2.4. This meant that the values could be determined. 5. The model was built in accordance with Smith and Jones. 6. An increase in the speed that the reader can read the paper was recorded. 7. Ten datasets were generated. 8. In the present study, a new methodology for solving the meaning of life was developed.

Modal Verbs

4. ***Choose the correct option: can, could, might: affirmative and negative.***

1. A greater understanding of our findings *can / could* lead to a theoretical improvement. 2. Further studies are needed to determine whether these findings *could / might* be applied to mechanical components. 3. Our findings *could / might* be applied quite reliably in other engineering contexts without a significant degradation in performance. 4. These findings *could / might* be exploited in any situation where predictions of outcomes are needed. 5. We only had a limited number of samples. A greater number of samples *can / could* lead to a different set of conclusions.

5. ***Fill in the gaps with the correct form of the modal verbs: can, be able, could, may, will.***

1. I _____ be wrong, but I don't think so. 2. I will _____ tell you tomorrow. 3. He _____ speak ten languages. 4. I hope to _____ to see her tomorrow. 5. She has never _____ to do this. 6. I _____ see that you like this one. 7. If I knew the answer I _____ tell you. 8. I _____ come at 6.0 if you like. 9. We _____ go the US next year but I'm not sure. 10. In five years' time inflation _____ be at over 15%.

6. ***Fill in the gaps with the correct form of the modal verbs: can, could, may, must, have to.***

1. It _____ not have been him you saw, he's left the country. 2. You should be more careful, you _____ have had an accident. 3. You _____ be right, but it still seems strange to me. 4. You _____ send the amount to us via a wire transfer. This _____ only be used for payments in US

dollars. 5. I realize you _____ very busy at the moment but if you could spare a moment I would be most grateful. 6. We _____ work tomorrow because it's a public holiday. 7. You _____ touch that it will give you an electric shock. 8. We generally _____ be at work before 09.30. 9. You _____ visit this website, it's really interesting. 10. You _____ come and see us when you're next in town.

READING AND SPEAKING

1. KNOWLEDGE AND EDUCATION DEVELOPMENT

7. ***Read the text and give the definition of e-knowledge.***

A Revolution in Knowledge Sharing

The pressure to transform our institutions of learning continues. Virtually every enterprise and institution is grappling with the disruptions and opportunities caused by Web-enabled infrastructures and practices. New best practices, business models, innovations, and strategies are emerging, including new ways to acquire, assimilate, and share knowledge. Using technologies that are already developed or that will be deployed over the next five years, best practices in knowledge sharing not only are diffusing rapidly but will be substantially reinvented in all settings: educational institutions, corporations, government organizations, associations, and nonprofits. But institutions of learning are in a unique position to benefit from an added opportunity: providing leadership in e-knowledge.

E-knowledge finds expression in many shapes and forms in a profoundly networked world. It is not just a digitized collection of knowledge. E-knowledge consists of knowledge objects and knowledge flows that combine content, context, and insights on application. E-knowledge also emerges from interactivity within and among communities of practice and from the troves of tacit knowledge and tradecraft that can be understood only through conversations with knowledgeable practitioners. E-knowing is the act of achieving understanding by interacting with individuals, communities of practice, and knowledge in a networked world. E-knowledge commerce consists of the transactions based on the sharing of knowledge. These transactions can involve the exchange of digital content/context and/or tacit knowledge through interactivity.

Transactable e-knowledge can be exchanged for free. E-knowledge is enabling not only the emergence of new best practices but also the reinvention of the fundamental business models and strategies that exist for e-learning and knowledge management. E-knowledge is technologically realized by the fusion of e-learning and knowledge management and through the networking of knowledge workers.

Transactable e-knowledge and knowledge net-working will become the lifeblood of knowledge sharing. They will create a vibrant market for e-knowledge commerce and will stimulate dramatic changes in the knowledge ecologies of enterprises of all kinds. They will support a "Knowledge Economy" based on creating, distributing, and adding value to knowledge, the very activities in which colleges and universities are engaged. Yet few colleges and universities have taken sufficient account of the need to use their knowledge assets to achieve strategic differentiation.

In *It Doesn't Matter*, a recent article in Harvard Business Review, Nicholas G. Carr endorsed corporate leaders' growing view that information technology offers only limited potential for strategic differentiation. Similar points are starting to be made about e-learning, and knowledge management has been under fire as ineffectual for some time. The truth is that e-learning and knowledge management can provide strategic differentiation only if they drive genuine innovation and business practice changes that yield greater value for learners. Carr's article provoked a host of contrary responses, including a letter from John Seely Brown and John Hagel III. Brown is well-known for his insights into the ways in which knowledge sharing can provide organizations with a solid basis for strategic differentiation.

8. ***Do the following statements agree with the claims of the text writer? There are three possible options (YES, NO, NOT GIVEN). Choose one option. Discuss your opinions with your groupmates.***

YES — if the statement agrees with the views of the writer;

NO — if the statement contradicts the views of the writer;

NOT GIVEN — if it is impossible to say what the writer thinks about this.

1. E-knowledge is primarily based on practices used in business.
2. Educational institutions can be leaders in knowledge net-working.
3. E-knowledge has several benefits to it.
4. Communities of practice are one source of E-knowledge.
5. The key to the success of knowledge management and e-learning is offering strategic differentiation.

9. ***Read the text again and complete the summary below. Fill in the gaps with the words from the text. Choose no more than two words for each gap.***

Thanks to the advent of the computer, learning institutions today are providing new ways of acquiring knowledge, through tools that are (1) _____ fast and which are being already (2) _____ in all fields and settings, despite the (3) _____ the process may entail, which all institutions are now (4). _____ .

10*. ***Explain the following word-combinations. Give their Russian equivalents.***

Disruptions and opportunities, Web-enabled infrastructures, best practices in knowledge sharing, non-profits, leadership, e-knowledge, knowledge flows, tacit knowledge, fundamental business models and strategies, e-knowledge commerce, knowledge economy, strategic differentiation.

11. Draw the table containing word families for the words from this Module Academic Word List. Complete Table 3.1. Sometimes more than one form may be possible. If you are unsure about a form, check Appendix 4. The first two words are done for you.

Table 3.1. Word Families for Module 3 Academic Word List

Verb	*Noun*	*Adjective*	*Adverb*	*Participle I, II*
access	access(es) accessibility	accessible inaccessible	accessibly	accessing accessed
adequate	adequacy (-ies) inadequacy	adequate inadequate	adequately inadequately	X

12. ***Fill in the gaps with the appropriate words from the list.***

output, resolved, phase, conferred, subsequent, code, access, annual, occupied, principal, attributes, status, implemented, cycle, hence, internal, domesticated, promotes, errors

1. Mario Lemieux had all the _____ a hockey team could ask for: speed, a hard and accurate shot, and an ability to read the game. 2. Our production costs have increased, _____ our prices have gone up as well. 3. In Japan, the dog is believed to have been _____ as early as the Jomon period, around 10,000 B.C. 4. Women generally focus more on a man's economic _____ than his appearance, probably because the woman carries most of the responsibility of rearing and nurturing the children. 5. Popstars Paul McCartney and Elton John have both had knighthoods _____ on them by the Queen of England. 6. The Americans _____ the Japanese islands of Okinawa until 1972. 7. Eating too much sugar _____ tooth decay. 8. Bank machines allow customers to _____ their accounts 24 hours a day. 9. Linguists recognize three main _____ in the evolution of the English language. 10. The body is supported by the skeleton, which also serves to protect the _____ organs. 11. Writing _____ for a software program is an endless, boring task. 12. While rock-climbing, you need to remain very focused so that you don't make any dangerous _____. 13. If the sun's energy _____ were decreased by 10%, the entire Earth would be covered in ice over a kilometer thick. 14. The _____ reason why she quit her job was because

she didn't feel she had any future there. 15. They have _____ a new procedure to make registration at the university easier and quicker. 16. The area which includes the Amazon River has the highest _____ rainfall in the world. 17. Ecuador and Peru's border war, which began in 1995, was _____ in 1999. 18. The supervisor has announced that our first staff meeting will last for two hours, and _____ meetings for only one hour. 19. Many festivals in Madagascar are connected with the natural _____ of the year, such as the harvest.

2. TODAY'S STUDENTS ARE TOMORROW'S SCIENTISTS

13. ***Read the article about education in Great Britain and find proofs that today's education is unfair.***

Unfair Education

In a country where government and families alike are tightening their belts and trying to make do with less, you could be pardoned for thinking that private education would be in a bit of a jam right now. And yet, although fees at independent schools in Britain have approximately doubled over the last two and a half decades, pupil numbers are the highest since records started in 1974. Although there are numerous reasons why parents might choose to fork out an average of £12,500 per year on their child's education, there is one which stands out more than any other: their reputation for getting their students into elite universities, such as the American Ivy League colleges and Britain's most prestigious universities: Oxford and Cambridge.

Private schools with experience in these admissions processes run like well-oiled machines. Their informed careers advisers have in-depth tactical knowledge of which colleges would best suit each candidate, and help them to edit their personal statements to reflect the qualities that elite universities are looking for. Interview training sessions guide young applicants through an interview system which has been described as being 'more reminiscent of an old-boy network than justice for society'. Those with family members and teachers who have successfully gone through the admissions process are at a considerable advantage to those who are the first to apply among their social group.

Consequently, the social mix of students at the top universities remains sadly biased towards the rich and privately educated — although thanks to increasing numbers of bursaries providing free private school education to academically gifted youngsters, it is possible to be one without the other. Even so, the fact is that 7% of British children go to private schools, while more than 40% of the intake at Oxford and Cambridge is privately educated, and this statistic depicts a worryingly skewed trend.

The proportion matters because, although there are obviously plenty of other universities offering

excellent study programs, an Oxbridge or Ivy-League degree undoubtedly enhances employability in the ruling professions. According to recent studies by the UK educational charity The Sutton Trust, over 30% of leading professionals in the United Kingdom, including almost 80% of lawyers, 47% of highflyers in financial services and 41% of top journalists attended Oxford or Cambridge. Every university-educated Prime Minister since 1937 except one, Gordon Brown, is an alumnus of one or the other, as are approximately two-thirds of the current government cabinet. This bias is bad news not only for the clever but underprivileged students who have to settle for a less renowned university; it is bad news for Britain, as decisions that affect the whole nation are made by a select group with a narrow pool of experience, rather than one that is representative of society as a whole.

This disproportion was brought to public attention in 2000, when politician Gordon Brown launched an attack on the selection processes at Oxford University. He publicized the story of Laura Spence, gifted students who had the "best A-level qualifications you can have", but nevertheless was turned down by Magdalen College, Oxford. Later, Member of Parliament David Lammy used the freedom of information act to examine admissions data at Oxford and Cambridge Universities, and found that almost 90% of the student body at both universities was drawn from the upper and middle classes, that in 2009 Oxford accepted only one British black Caribbean undergraduate, and it focused its attentions on admissions events at private schools such as Kate Middleton's school, Marlborough College, and Prince William's alma mater, Eton.

Since then, universities have been forced to up their game welcoming the less privileged among their students. Quotas have been put into place to ensure that the colleges admit a larger proportion of less privileged students. These targets are not often met, however, and they have brought about a new practice in which parents privately educate their children up to the age of 16, giving them a sound academic background, then put them in state education for their two final years, to better improve their chances of being accepted at a top university as part of their 'less privileged' quota. Even so, Oxford now spends $4 million a year on student outreach, a $1.6 million increase since 2007. Much of this is spent on school visits and teacher-training programs aimed at supporting poor and minority students who wish to apply to the university. The university has also launched a summer school, which allows around 500 academically talented, state-school students a chance to experience studying at Oxford for a week.

And yet these strategies depend on state schools being able to educate students to the same level as private schools; where stringent selection processes, partnered with high budgets, parental support and top-class facilities allow schools to spew out students of an impressively high academic caliber. State schools have much less opportunity to do this. Or have they? One commentator argues that the success of private schools is not in their money, but in their organization. State schools fail their pupils because, under government control, they lack options. But if head teachers at state schools were given

the same freedom as those at private schools, namely to sack poor teachers and pay more to good ones, parents would not need to send their children to private schools any more.

14. ***Do the following statements agree with the claims of the text writer? There are three possible options (YES, NO, NOT GIVEN). Choose one option. Discuss your opinions with your groupmates.***

YES — if the statement agrees with the views of the writer;

NO — if the statement contradicts the views of the writer;

NOT GIVEN — if it is impossible to say what the writer thinks about this.

1. Numbers of pupils at private schools have doubled since 1975.
2. On average, the cost of tuition at a private school in the UK is £12,500 per child, per year.
3. The interview process at elite universities gives private and state-educated students an equal chance of success.
4. All students at private schools in Britain come from rich families.
5. Most leading politicians and judges in the UK were educated at Oxford or Cambridge University.
6. Former prime minister Gordon Brown was educated at to Oxford University.
7. Both Kate Middleton and Prince William applied to Oxford University.

15. ***Read the article again and complete the summary below. Fill in the gaps with the words from the article. Choose no more than two words for each gap.***

One study found that nearly nine tenths of students entering Oxford and Cambridge universities came from the (1) _____ Universities must now adhere to (2) _____ to ensure that they admit a socio-economic mix of students. This has led to parents choosing to educate their children in (3) _____ to increase their chances of getting into an elite university. Oxford's program has been expanded to attract the (4) _____. However, private schools can educate students to a higher standard because they have more money and they employ strict. However, one commentator believes that state schools would do better if their head teachers were allowed more (5) _____.

16. ***Fill in the gaps with the most appropriate words from the list.***

summary, despite, communication, series, imposed, goal, professionally, mechanisms, approximately, unparalleled

1. We hope to achieve our _____ of increasing our profits by at least 20% this year. 2. The rapid and continued success of Microsoft Corporation is almost _____ in the world of business. 3. Vincent van Gogh once said that great things are done by a _____ of small things brought

together. 4. Female killer whales stop giving birth at _____ 40 years of age. 5. _____. its large size, the grizzly bear is amazingly fast, reaching speeds of over 60 kilometers per hour. 6. The government of Iraq considers the international boundaries of the Arab nations to have been _____ by the Europeans who occupied the countries following the Second World War. 7. Louis Boone once said, "Don't fear failure so much that you refuse to try new things. The saddest _____ of a life contains three descriptions: could have, might have, and should have." 8. The coach needs to maintain a good, honest _____ with all his players. 9. Many psychologists believe that most animal species, including humans, seem to share basic learning _____. 10. Dwayne was too short to play basketball _____, so he went into coaching instead.

3. INNOVATION SYSTEMS. DEVELOPING SCIENTIFIC WORLDVIEW

17. ***Read the text and choose the mechanisms of innovation in contemporary science and technology. Discuss them with your groupmates.***

Mechanisms of Innovation

An examination of the mechanisms of innovation relies on theoretical lenses to create a comprehensive model of the innovation process. Most innovation process models conceptualize the process as linear, proposing remarkable and distinct stages that enable a deeper exploration of the causal mechanisms underlying the process or lifecycle. The early stages in the innovation lifecycle involve the transfer of knowledge and technology, and analytical frameworks used to explore this stage often focus on the systemic transfer of scientific knowledge and technology between universities, industries, and government institutions, also referred to as the triple helix. Recent science and technology policy studies focus specific attention on diffusion processes that result in the transfer of knowledge and technology. Macro level analyses explore national level factors, paying particular attention to knowledge transfer networks, the decentralization of science policies, and organizational structures, but micro level factors, such as organizational identity and innovative organizational systems, have gained more recent attention as well. Barriers to cross-sector work within the triple helix have been identified as information process-oriented, cultural, and political. In this specific area of focus, scholars rely on indicators to track technological transfers, but recent work suggests that traditionally-used indicators have some limitations. For instance, the influence of licensing structures within the university setting, faculty engagement, inequalities associated with data sharing through digital-based networks, and gaps in knowledge are indicated as having a significant impact on knowledge transfer. Collaborations are viewed a primary tool for fostering innovation at every level.

At the national level, early stages of the innovation lifecycle involve the sharing of knowledge and technology highlighting the relationships between universities and industries. Recent research evaluates peer-based 'translational' programs, utilized by some universities to overcome obstacles that inhibit the development of research into new technologies. Later stages of the innovation lifecycle involve commercialization, emphasizing the interactions between private industry and the government.

At the international level, global collaborations led by related international organizations provide important resources to assist member countries in identifying systemic weaknesses in technological development and facilitate collaborations to expand knowledge bases through open innovation. Policy tools aimed at facilitating innovation, particularly among nations with developing or transitional economies and centralized governments, include the use of public procurement, increased research and development expenditures and related tax credit schemes to build the infrastructure necessary to support technological development. The early stages of innovation may involve imitation, implementation, and even adaption of existing technologies. Structured networks that can serve as catalysts for transferring knowledge, technology, and policy across various economic systems are crucial.

Technology Adoption. The economic benefits of innovative technologies depend upon successful commercialization and ultimate adoption of new technologies. Policy researchers have been actively investigating factors that may influence successful technology adoption. In particular, our review reveals that sustainable energy technology dominates this area of research in recent years, with studies focusing on national level trade policies, funding schemes, various policy instruments, and economic factors.

18. ***Answer the questions to the text from exercise 17. Your answers should be based on the reading and your personal experience.***

1. What is a comprehensive model of the innovation process?
2. What is the triple helix? How does it refer to the innovation lifecycle?
3. Why are knowledge transfer networks important in the innovation process?
4. What limitations do traditionally-used indicators to track technological transfers have? Why do they prevent innovation?
5. What is the difference between early and later stages of the innovation lifecycle?
6. Why are global collaborations necessary to support innovation process?
7. Why are structured networks crucial?
8. How does the process of technology adoption occur?

19. ***Fill in the gaps with the appropriate words from the list.***

obviously, projecting, dimensions, attitude, granted, parameters, undertaking, disintegrate, statistics, concentrated.

1. The students in the class had a negative _____ towards learning because the teacher treated them like idiots whenever they made mistakes. 2. Nearly 90 percent of Canada's population is _____ within 160 kilometers of the United States/Canada border. 3. The Hawaiian Islands are the _____ tops of the biggest mountain range in the world. 4. Look at that sunburn; she _____ forgot to put on her sunscreen. 5. Human hair and fingernails are the last part of the body to _____ after we die. 6. His measurements of the _____ of the room were not very accurate. 7. If you change the _____ of your spreadsheet, it may not print properly. 8. Remodeling the kitchen was a huge _____ for us because we'd never done anything like it before. 9. The government has _____ political asylum to those refugees from Kosovo who requested it. 10. Recent _____ show that over 15% of immigrants to this country end up leaving the country within 3 years due to a lack of work.

4. KNOWLEDGE AND COMPETENCES AS BASIS OF FUTURE CAREER

20. ***Read the text and answer the following question. Find proofs in the text to support your answer.***
Which three of the following does the writer regard as a feature of creative families?

a. a higher than average level of parental affection
b. competition between brothers and sisters
c. parents who demonstrate vocational commitment
d. strong motivation to take exams and attend university
e. a patient approach to achieving success
f. the identification of the most talented child in the family

Intelligence and Creative Ability

What do we mean by being 'talented' or 'gifted'? The most obvious way is to look at the work someone does and if they are capable of significant success, label them as talented. The purely quantitative route — 'percentage definition' — looks not at individuals, but at simple percentages, such as the top five per cent of the population, and labels them — by definition — as gifted. This definition has fallen from favor, eclipsed by the advent of IQ tests, favored by luminaries such as Professor Hans Eysenck, where a series of written or verbal tests of general intelligence leads to a score of intelligence.

The IQ test has been eclipsed in turn. Most people studying intelligence and creativity in the new millennium now prefer a broader definition, using a multifaceted approach where talents in many areas are recognized rather than purely concentrating on academic achievement. If we are therefore

assuming that talented, creative or gifted individuals may need to be assessed across a range of abilities, does this mean intelligence can run in families as a genetic or inherited tendency? Mental dysfunction — such as schizophrenia — can, so is an efficient mental capacity passed on from parent to child?

Animal experiments throw some light on this question, and on the whole area of whether it is genetics, the environment or a combination of the two that allows for intelligence and creative ability. Different strains of rats show great differences in intelligence or 'rat reasoning'. If these are brought up in normal conditions and then through a maze to reach a food goal, the 'bright' strain make far fewer wrong turns that the 'dull' ones. But if the environment is made dull and boring the number of errors becomes equal. Return the rats to an exciting maze and the discrepancy returns as before — but is much smaller. In other words, a dull rat in a stimulating environment will almost do as well as a bright rat who is bored in a normal one. This principle applies to humans too - someone may be born with innate intelligence, but their environment probably has the final say over whether they become creative or even a genius.

Evidence now exists that most young children, if given enough opportunities and encouragement, are able to achieve significant and sustainable levels of academic or sporting prowess. Bright or creative children are often physically very active at the same time, and so may receive more parental attention as a result — almost by default — in order to ensure their safety. They may also talk earlier, and this, in turn, breeds parental interest. This can sometimes cause problems with other siblings who may feel jealous even though they themselves may be bright. Their creative talents may be undervalued and so never come to fruition. Two themes seem to run through famously creative families as a result.

The first is that the parents were able to identify the talents of each child, and nurture and encourage these accordingly but in an even-handed manner. Individual differences were encouraged, and friendly sibling rivalry was not seen as a particular problem. If the father is, say, a famous actor, there is no undue pressure for his children to follow him onto the boards, but instead, their chosen interests are encouraged. There need not even by any obvious talent in such a family since there always needs to be someone who sets the family career in motion, as in the case of the Sheen acting dynasty.

Martin Sheen was the seventh of ten children born to a Spanish immigrant father and an Irish mother. Despite intense parental disapproval he turned his back on entrance exams to university and borrowed cash from a local priest to start a fledgling acting career. His acting successes in films such as Badlands and Apocalypse Now made him one of the most highly-regarded actors of the 1970s. Three sons — Emilio Estevez, Ramon Estevez and Charlie Sheen — have followed him into the profession as a consequence of being inspired by his motivation and enthusiasm. A stream seems to run through creative families. Such children are not necessarily smothered with love by their parents.

They feel loved and wanted, and are secure in their home, but are often more surrounded by an atmosphere of work and where following a calling appears to be important. They may see from their parents that it takes time and dedication to be master of a craft, and so are in less of a hurry to achieve for themselves once they start to work.

The generation of creativity is complex: it is a mixture of genetics, the environment, parental teaching and luck that determines how successful or talented family members are. This last point — luck — is often not mentioned where talent is concerned but plays an undoubted part. Mozart, considered by many to be the finest composer of all time, was lucky to be living in an age that encouraged the writing of music. He was brought up surrounded by it, his father was a musician who encouraged him to the point of giving up his job to promote his child genius, and he learnt musical composition with frightening speed — the speed of a genius. Mozart himself simply wanted to create the finest music ever written but did not necessarily view himself as a genius — he could write sublime music at will, and so often preferred to lead a hedonistic lifestyle that he found more exciting than writing music to order.

Albert Einstein and Bill Gates are two more examples of people whose talents have blossomed by virtue of the times they were living in. Einstein was a solitary, somewhat slow child who had affection at home but whose phenomenal intelligence emerged without any obvious parental input. This may have been partly due to the fact that at the start of the 20th Century a lot of the Newtonian laws of physics were being questioned, leaving a fertile ground for ideas such as his to be developed. Bill Gates may have had the creative vision to develop Microsoft, but without the new computer age dawning at the same time, he may never have achieved the position on the world stage he now occupies.

21. ***From the list below choose the most suitable title for the whole text.***

a. Geniuses in their time
b. Education for the gifted
c. Revising the definition of intelligence
d. Nurturing talent within the family

22. ***Complete the sentences by choosing the correct option (a, b, c, or d).***

1. The rat experiment was conducted to show that _____

a. certain species of rat are more intelligent than others.
b. intelligent rats are more motivated than ‘dull’ rats.
c. a rat’s surroundings can influence its behavior.
d. a boring environment has little impact on a ‘bright’ rat.

2. The writer cites the story of Martin Sheen to show that _____

a. he was the first in a creative line.
b. his parents did not have his creative flair.
c. he became an actor without proper training.
d. his sons were able to benefit from his talents.

23. ***Do the following statements agree with the claims of the text writer? There are three possible options (TRUE, FALSE, NOT GIVEN). Choose one option. Discuss your opinions with your groupmates.***

1. Intelligence tests have now been proved to be unreliable.
2. The brother or sister of a gifted older child may fail to fulfil their own potential.
3. The importance of luck in the genius equation tends to be ignored.
4. Mozart was acutely aware of his own remarkable talent.
5. Einstein and Gates would have achieved success in any era.

24. ***Fill in the gaps with the appropriate words from the list.***

compounds, medicinal, generated, trends, drafting, substitute, pursued, alterations, objective, evolving

1. Chemicals entering the water system from industries located along the river are forming thousands of different _____, many of which are highly toxic. 2. After independence, Tanzania _____ a policy of socialism. 3. The blueprints for the Eiffel Tower covered more than 14,000 square feet of _____ paper. 4. Nothing can _____ for the feeling you get when you are in love; not money, not power, not anything. 5. Most of the power _____ by the dam will be sold to the northern American states. 6. The first _____ of our marketing campaign has to be to make our product known to the public. 7. Pulsating stars confirm that stars are continuously _____. 8. She uses a variety of _____ herbs to treat her illnesses. 9. Economic _____ have an especially severe impact on adolescents who are trying to become independent. 10. I bought some new pants at Sears, and they're going to do the _____ for free.

25. ***Group discussion on the topic "Principles of Knowledge Management". Discuss the following statements in the group. Express and prove your opinions; support them with the examples from your experience.***

1. Knowledge management is based on the idea that knowledge is an asset that should be managed.
2. Knowledge management principles are an enduring set of guidelines for managing knowledge that are established by an organization, program or team. Knowledge management is based on the idea

that knowledge is an asset that should be managed.

3. Knowledge that is not improved quickly loses its value. Knowledge management is a process of continual improvement.
4. Search is a critical tool for knowledge discovery. Executive management may choose to make search a priority.
5. A primary goal of knowledge management is to facilitate the sharing of knowledge. Encourage your organization to share (e.g. lunch and learn sessions).
6. Knowledge that sits on a shelf has no value. The value of knowledge depends on communication and socialization. The creation, assessment, improvement and use of knowledge is largely a social process.
7. Your knowledge management program needs the support of executive management to have any chance of success. Knowledge management principles define your high-level approach to managing your organization's knowledge.
8. Knowledge is your most valuable information. It’s critical that information security best practices be followed for knowledge management processes and tools.

26*. *Read the text and render it in English.*

О развитии образования в Российской Федерации

Национальная доктрина образования до 2025 года является основополагающим государственным документом, который устанавливает приоритет такой сферы общественной деятельности как образование. Этот нормативный акт определяет политику государства, направления и стратегию развития. Доктрина образования до 2025 года устанавливает цели обучения и воспитания, а также их пути достижения с помощью разработки подпрограмм в политике государства и постановки прогнозируемых результатов.

Цели программы следующие: обеспечение высокого уровня качества жизни населения, создание базы для развития стабильного уровня национальной безопасности, духовного и социально-экономического развития страны; провозглашение и укрепление принципов правового демократического государства, в котором будет проживать гражданское общество; обеспечение активно развивающейся экономики рыночного типа квалифицированными кадрами, которые будут принимать активное участие в интеграции экономики на мировом уровне, создавая высокую конкурентоспособность страны и инвестиционную привлекательность; восстановления российского статуса «великая держава» в искусстве, культуре, науке, экономике и высоких технологиях.

Доктрина образования в Российской Федерации отражает различные интересы многонационального гражданского общества, способствует созданию условий для повсеместного

получения образования населением, позволяет обеспечить равенство правовых позиций всех граждан на практике и дать возможность каждому человеку повышать уровень образования на протяжении жизни. Рассматриваемый документ определяет образование как приоритетную сферу формирования и накопления умений и знаний. Национальная доктрина образования в Российской Федерации способствует созданию благоприятных обстоятельств для обнаружения и развития способностей творческого направления российских граждан, воспитания в них принципов нравственного типа и трудолюбия …...

Национальная доктрина образования в Российской Федерации провозглашает цели образовательной системы в стране. 1. Историческая преемственность разных поколений, сбережение, передача и развитие культуры национального масштаба, воспитание уважительного отношения к культурному и историческому наследию населения страны. 2. Воспитание патриотизма в российских гражданах; развитие правильной правовой и демократической позиции, а также хорошо социализирующихся в обществе людей, которые будут уважать свободы, интересы и права личности, иметь высокую нравственность, религиозную и национальную терпимость, уважать языки, традиции и культуру других национальностей и народов. 3. Формирование правильной мировой культуры и отношений между людьми, по доктрине образования. 4. Своевременное и разностороннее развитие молодежи и детей, их самообразовательных способностей, навыков творчества и самореализации. 5. Формирование понимания общей картины мира и мировоззрения научного характера, а также развитие межэтнической культуры отношений. 6. Развитие мотивации трудового характера у людей разных возрастов, выработка активной профессиональной и жизненной позиции, обучение базовым принципам и навыкам построения карьеры и выработки правильного поведения на трудовом рынке. 7. Организация процесса обучения с применением современных научных достижений, периодическое обновление образовательных аспектов в соответствии с изменениями в культурной, экономической, научной, технической и технологической сферах. 8. Реализация непрерывного образования на протяжении всего жизненного цикла человека. 9. Выработка многообразных видов и типов учреждений образования, выработка многовариантных типов программ, которые будут обеспечивать индивидуализацию и личностное ориентирование процесса воспитания и обучения. 10. Развитие преемственности степеней и уровней образования. 11. Разработка программ, которые реализуют информационные образовательные технологии и позволят развивать открытое образование. 12. Разработка методов создания академической мобильности обучающихся. 13. Развитие российских традиций при работе с детьми, подростками и молодежью, обладающими особыми умственными навыками, а также вовлечение работников педагогической сферы в научную деятельность. 14. Подготовка высокообразованных граждан (будущих специалистов), которые будут готовы расти в профессиональной сфере, проявлять мобильность в

условиях информационного развития общества и появления научных технологий. 15. Воспитание принципов спортивного развития у детей и молодежи и здорового образа жизни. 16. Выработка противодействия негативным процессам, происходящим в социуме. 17. Воспитание бережного отношения граждан к природе, развитие экологической толерантности …...

Планируемые результаты реализации доктрины современного образования. При разработке указанной программы государство прогнозировала следующие результаты: индивидуализацию процесса обучения с помощью создания разнообразных форм и видов учреждений и программ образования, которые будут учитывать способности и интересы каждой личности; создание образовательной системы демократического типа, которая будет гарантировать создание необходимых условий для получения качественного полноценного образования на каждом уровне; повышение уровня образования до конкурентоспособного по параметрам содержания и качества.

Национальная доктрина образования в Российской Федерации:
Постановление Правительства РФ от 04.10.2000, № 751, https://fb.ru/article/413885/

27. *Group discussion on the topic "Education Development in Russia and Abroad". Discuss the following statements in the group. Express and prove your opinions; support them with the examples from your experience.*

1. The market for educational services is highly competitive: there is a large number of educational institutions.
2. The Russian government has pushed an ambitious higher education agenda focused on improving quality and international standing.
3. The country is seeking to radically enhance the global ranking of its universities by 2020, and to attract substantial numbers of internationally mobile tertiary-level students from around the globe.
4. The government has actively sought to send scholars abroad — and incent them to return home as part of a broader effort to modernize the flagging economy.
5. The reform effort is driven by concerns about educational quality. The main goal of the reforms is to merge poorly performing universities with higher quality institutions.
7. Foreign student quotas are seen as a measure of the effectiveness of higher education institutions, and the Russian government has, as part of its effort to boost the rankings of its universities, made it a priority to boost international enrollments.
8. The most popular destination choice among Russian degree students abroad in recent years has been Germany, where 18 percent of outbound students were enrolled in 2019 (UIS). The U.S., the Czech Republic, Great Britain, and France were the next popular choices, accounting for 9 percent, 8 percent, and 7 percent of enrollments, respectively.

9. Russian education has become more expensive for many students, even in the public sector. Students with high EGE scores are usually allowed to study for free; however, many students pay annual tuition fees averaging 120–140 thousand rubles for a bachelor's degree and 220–250 thousand rubles for a Specialist degree.
10. Education abroad is less affordable than in Russia.

WRITING

28. ***Translate one paragraph from the following text in the written form paying attention to its grammar, lexical, and stylistic peculiarities.***

The Mighty Semiconductor and the Rise of Silicon Valley

For thousands of years, people lived in a world without computers. There were no video games and no smartphones. Now computers are part of the daily life of many people, and it's hard to imagine a world without them. What is it that makes a computer work? Inside every computer is a tiny circuit called a semiconductor. Often, a semiconductor is essentially a couple wires attached to a piece of silicon (a mineral like quartz). Though semiconductors are very small, they are important. Semiconductors are what make many electronics work, from car radios to the systems that pilots use to fly airplanes. For a computer to work, it needs electricity. Semiconductors carry the electric signals in computers.

In the United States, almost all semiconductors are made in a place called Silicon Valley. Silicon Valley is just outside of San Francisco and is home to some of the country's smartest scientists. The history of Silicon Valley is tied to the history of the semiconductor. The first mass-produced semiconductor was designed in the 1950s in Silicon Valley by a company called Fairchild Semiconductor. The engineers at Fairchild were interested in finding ways to make machines faster and smaller. Before Fairchild, people knew how to make semiconductors, but they didn't know how to make large batches of them. In those early years, Robert Noyce was the boss at Fairchild. He was in charge of making sure the company built cutting-edge products the world had never seen before. Robert wanted his company to be a community where everyone was equal. At Fairchild, an engineer could rise to the top quickly, as long as he or she had a good idea. Everyone pitched in to help with problems, and everyone celebrated when a problem was solved.

Engineers loved working at Fairchild, and the company grew quickly. NASA needed semiconductors for the computers in their new spaceships. The United States Department of Defense needed semiconductors for planes and other military vehicles. Computer systems were being put into all

kinds of devices, and every single computer needed semiconductors. Soon engineers at Fairchild began quitting. They had exciting ideas and wanted to start their own companies. More than 50 other semiconductor companies were started by former employees at Fairchild. Most of these companies stayed in Silicon Valley. Soon it made sense for other high-tech companies to move to Silicon Valley, since there were already so many talented engineers in the area. In the 1970s the area began to be called "Silicon Valley," after the mineral that was the backbone of the semiconductor.

As computers spread throughout the country, Silicon Valley grew along with the industry. Soon it wasn't just semiconductor companies. There were companies that made personal computers, printers, software… the list went on and on. Apple, the maker of the first personal computer, had headquarters close to Silicon Valley. Years later, Google's headquarters were set in Mountain View, in the exact same city as Fairchild Semiconductor's first building. Companies like Apple and Google have been attracting thousands of engineers from all over the world, making Silicon Valley a wealthy and thriving area. Investors have also followed engineers to Silicon Valley looking for promising companies with big futures. These new investors — known as venture capital firms — give a company the money it needs to start a business. Then if the company becomes big, a large chunk of the money it makes goes back to the investors.

But it isn't just the money that draws workers to Silicon Valley — it's also the opportunity. In Silicon Valley, there are new companies being created every week. There is money to invest in new companies. Silicon Valley has become a new global center of technology. As of 2013, Silicon Valley is home to more than 3 million people. Many of them came from other countries, and in over half of the homes in Silicon Valley, families speak another language besides English. Both immigrants from other countries and people who move to Silicon Valley from other parts of the United States bring new ideas to Silicon Valley. Soon these people may start their own companies, and those new companies may attract more engineers from other parts of the world. And so, Silicon Valley will continue to grow.

29*. ***Write an abstract of the following text paying attention to academic grammar, lexical, structural, and stylistic peculiarities.***

How to Manage Knowledge

Knowledge management is the continual process of squeezing value from knowledge. Information isn't knowledge. It can be a long path to transform information into knowledge. It can also be a long path to transform knowledge into business results. Knowledge management achieves both these objectives. It transforms information into actionable knowledge that drives business results. Knowledge management is a business practice and process. It's supported by a collection of tools. At the highest level the knowledge management process looks like this: 1. Create & Identify Knowledge. Many

organizations are leaking knowledge like a fast sinking rowboat. The first step to managing knowledge is to identify the knowledge your organization is creating. Programs, projects, initiatives, processes and conversations all generate knowledge. Knowledge management identifies the critical knowledge that your organization is creating.

2. Validate & Assess. Validate knowledge. For example, does a new research report come from a reputable source? Assess the business impact of knowledge. For example, what stakeholders need to be informed about a new research report? 3. Secure & Retain. Retain knowledge in an accessible and secure repository. Identify and manage knowledge retention policies. Certain knowledge must be retained for a minimum period of time (and often no longer) for compliance. Knowledge should be secured according to information security best practices. Information security objectives such as information privacy, confidentiality, integrity, availability and auditability should be incorporated into processes and tools.

4. Organize and Search. Create views and organize knowledge. Provide search tools that help users to discover knowledge. 5. Communicate and Socialize. Processes and tools that communicate and socialize knowledge. These processes feed into knowledge improvement and creation. 6. Combine, Connect and Adapt. Provide knowledge interfaces that allow users to make connections, combine, build upon and adapt knowledge. 7. Continuously Improve. Continuously improve knowledge quality. For example, improve knowledge accuracy, availability and business value. 8. Measure and Report. What is your organization's knowledge worth? How fast is your knowledge growing? Does your knowledge have quality issues? What are your knowledge related risks? Mature knowledge management processes can be measured. Such measurements are the basis for continual improvement of knowledge.

Knowledge Processes Versus Tools. It’s a common myth that knowledge management is a technology. Many organizations purchase a knowledge management tool but fail to integrate it into their processes. Knowledge management is first and foremost a business practice. Tools should be selected to support knowledge management processes and not the other way around. That being said, it's difficult to image a knowledge management process succeeding without a few basic tools such as a content repository (e.g.* enterprise content management) and a search tool.

Knowledge Management Integration. Knowledge management supports your strategies, decisions, programs, projects, initiatives, conversations and communications. Likewise, these business activities feed into knowledge management.

To be effective, knowledge management should be integrated into all business activities. This requires a great deal of executive support. Some organizations have established knowledge management principles that apply to all business activities. For example, mandating that all documentation is checked into a central repository.

** For interpretation of Latin abbreviations, see Appendix 3.*

30*. *Write a summary on one of the following topics: "Competence Building Approach in the Russian Federation"; "How to Organize Knowledge Building"; "How to Prepare a Scientific Paper"; "Development of Fundamental Sciences in the Russian Federation". Write at least 1000 words.*

SELF-STUDY ACTIVITIES

31. *Complete each sentence choosing the correct option: active or passive.*

1. *He / It* is understood that he was in Paris at that time. 2. They are believed to *be investigated / be investigating* the cause of the accident. 3. She is expected to *be / have been* promoted to editor in the near future. 4. The company is expected *to cut back / it will cut back* on advertising. 5. They *know / are known* to be interested in buying the newspaper. 6. The bosses *are thinking / are thought* about moving to a new building. 7. The newspaper *is reported / is reporting* to be under investigation. 8. Some investigators are claimed to *use / have used* illegal means of gathering information in the recent scandal. 9. The reporters are said to *be frightened / be frightening* of losing their jobs. 10. She is thought to *be / have given* ideas for her column by her aunt.

32. *Fill in the gaps with the correct form of the modal verbs: can, could, may, might, will, must, have to in positive, negative or interrogative forms.*

1. Although this is a small study, the results _____be generalized to several areas. 2. Unfortunately, our database _____ tell the exact scale of the country's investment overseas. Consequently, we conclude that… 3. This research _____ be useful for you. 4. _____ you hear that noise? It's terrible. 5. You _____ be right. 6. I _____ tell him as soon as I see him. 7. It rain, so we should take our umbrellas. 8. You _____ have realized that you had got the wrong person when she told you that she didn't know what you were talking about. 9. _____ I pay by American Express? 10. I was wondering if by any chance, you _____ be able to help me. 11. I'm really sorry but I absolutely _____ have them by four o'clock. 12. Sorry but your email _____ have gone into the spam. 13. You _____ be so proud of yourself. 14. I know you be very busy but… 15. _____ do a presentation or just write a paper?

33*. *Fill in the gaps with the appropriate words from the list.*

contact, unlicensed, target, enforcement, entities, academic, unmonitored, stabilized, transit, whereas, challenging, capacity, prime, revenue, network, logically, decline, externally, precisely

1. The local high school has an excellent counselling program in which students give advice to each other on personal and _____ issues. 2. The old man was seriously ill when he was first admitted to hospital, but his condition has since _____. 3. Online communications can _____ learning in many different ways. 4. The elderly face numerous challenges presented by both physical _____, and the attitudes of society in general. 5. There is a _____ of scientists working throughout the world to find a cure for cancer. 6. The ferry takes about 2 hours to make the _____ between the two islands. 7. I much prefer a _____ job with lots of responsibility to an easy, boring job. 8. In the theory of relativity, space and time are not viewed as separate _____. 9. If you approach the situation _____, rather than emotionally, you can make a much fairer decision. 10. The federal government has asked the major television networks to find a way to reduce the number of scenes of sex and violence during the _____ viewing hours. 11. When giving a presentation in small groups, it is important to make eye _____ with your entire audience. 12. According to the instructions, this medicine is to be used _____ only. 13. My parents were both in a serious car accident when they were in their early twenties, but my mother broke her neck, _____ my father only received a few cuts and bruises. 14. The daycare center was _____ and did not meet the minimum safety and health requirements. 15. The head of the F.B.I. once observed that no amount of law _____ can solve a problem that goes back to the family. 16. Tobacco brings _____ to government in the form of taxes. 17. If left _____, the children may hurt themselves. 18. Many living creatures are very _____ adapted to particular ways of life. 19. The factory has increased its production _____ by over 15% to meet the growing demand. 20. The country of Wales was long a _____ for invaders from Rome, Normandy, and England.

34*. *Read a student's essay and complete the gaps with one of the words or phrases from the list. Then say whether you agree or disagree with the author. Prove your opinion.*

discipline, literacy, health, primary, enroll, higher, further, day release, degree, skills, kindergarten, pass, qualifications, evening class, graduate, numeracy, secondary, mature, graduate, higher, on-line

You will need to change the form of some of the words. 'You are never too old to learn'. Do you agree with this statement? Education is a long process that not only provides us with basic (1) _____ such as (2) _____ and (3) _____, but is also essential in shaping our future lives. From the moment, we enter (4) _____ as mall children, and as we progress through (5) _____ and (6) _____ education, we are laying the foundations for the life ahead of us. We must (7) _____ ourselves to work hard so that we can (8) _____ exams and gain the (9) _____ we will need to secure a good job. We must also (10) _____ valuable life skills so that we can fit in and work

with those around us. And of course, (11) _____ education helps us to understand how we can stay fit and healthy. For most people, this process ends when they are in their mid-to-late teens. For others, however, it is the beginning of a lifetime of learning. After they finish school, many progress to (12) _____ education where they will learn more useful skills such as computer literacy or basic business management. Others will (13) _____ on a programme of (14) _____ education at a university where, with hard work, they will have the opportunity to (15) _____ after three or four years with a well-earned (16) _____. After that, they may work for a while before opting to study for a (17) _____ degree – an MA, for example, or a PhD. Alternatively, they may choose to attend an (18) _____ after work or, if they have a sympathetic employer, obtain (19) _____ so that they can study during the week. And if they live a long way from a college or university, they might follow an (20) _____ course using the Internet. In fact, it is largely due to the proliferation of computers that many people who have not been near a school for many years, have started to study again and can proudly class themselves as (21) _____ students. We live in a fascinating and constantly changing world, and we must continually learn and acquire new knowledge if we are to adapt and keep up with changing events. Our schooldays are just the beginning of this process, and we should make the best of every (22) _____. to develop ourselves, whether we are 18 or 80. You are, indeed, never too old to learn.

35. ***Choose a scientific article in English concerning your own field of science from any valid information source (10 000 printed characters) and prepare its oral translation into Russian.***

36. ***Search the Internet and go to the libraries to find scientific and technical articles on the topics of Module 3. Analyze the gathered material, then prepare a 10-minute report on the chosen topic. Give a Power Point presentation in the group (see Appendix 1).***

MODULE TEST 3

Variant 1

1. ***Complete the sentences choosing the correct passive form of the verbs in brackets.***

She _____ (give) her next assignment right now. 2. We _____ (show) around the studio after our interviews are over. 3. News of the accident _____ (send) to all the news agencies by now. 4. Kathy wants _____ (offer) the chance to work in the New York office. 5. While the last articles _____ (check), the owner arrived. 6. Journalists enjoy _____ (tell) that their columns are very popular. 7. The articles _____ (hand in) to the editor before 6 pm yesterday. 8. By the time they noticed the mistake, the magazine _____ (print). 9. She has promised that all the journalists who

lose their jobs _____ (propose) the new ones. 10. By this time tomorrow the story _____ (read) by millions of people.

2. *Choose the correct option.*

1. *Were you able to / Could you* repair your DVD player when it broke down last week? 2. *Would / May you* explain how this program works, please? 3. You *may / might* come into work late tomorrow if you have a doctor's appointment early in the morning. 4. Sue's looking for the battery charger, but she *couldn't / hasn't been able to* find it yet. 5. They *couldn't / wouldn't* understand why the experiment had failed. 6. You *can't / aren't be able to* use that laptop; it's not yours! 7. *Are you able to / Could you* get me some ink for my printer, please? 8. *Could / Would* you mind lending me your mobile for a moment? 9. George was happy because he *had been able to / could* get a discount on his new television. 10. *Might / May* I have a look at your video camera, Paul?

3. *Fill in the gaps with the appropriate words from the list.*

perspectives, exposure, energetic, consultant, symbolic, welfare, liberalizing, modified, awareness, rejected.

1. A white dove is _____ of peace and goodwill between nations. 2. He worked in a bank for about 35 years, and then became a financial _____ after he retired. 3. Maurice Strong recently remarked that we cannot trade the _____ of our future generations for profits now. 4. Different cultures have very different _____ on death. For some it is the end; for others, it is a new beginning. 5. _____ to a foreign language at an early age can help in the acquisition of that language later on in life. 6. Children are amazingly _____; they can play for hours without getting tired. 7. The landscape of our planet is greatly _____ by the tremendous volume of water circulating on its surface. 8. Abraham Maslow observed that what is necessary to change a person is to change his _____ of himself. 9. Gautama Buddha was an Indian prince who _____ his wealthy lifestyle to lead a simpler existence. 10. Malta is currently privatizing state-controlled companies and _____ markets in order to prepare for membership in the European Union.

4. *Read the text and answer the questions below it.*

Solving New York City's Hurricane Problem with Representations

Sketches or drawings can help people communicate to others ideas about how to solve problems, big or small. Drawings make ideas visual, so they are easier to understand than a spoken or written explanation, and using them allows for many different drafts to be presented before deciding on a final product. When a hurricane hit New York City in 2012, the city realized it was not prepared to handle such a disaster. The hurricane damaged the city badly and left many people without homes. Sea levels

were going to continue to rise, which meant potential for more hurricanes and flooding, and the government realized it had to change some things about the city to make it better able to handle future disasters.

Rather than simply begin building bigger, stronger structures, like a giant wall around the city or a gate to keep water out, people started sketching out their ideas about how to make New York a place that could better withstand hurricanes. These people were experts chosen to take on the task of re-imagining the city. By using drawings, people were able to debate these ideas, decide which ones were best and change them as they saw fit. Drawings also allowed experts in certain areas to show and explain things to people who didn't know as much as them about those subjects. Some people focused on how to change the city's natural environment, like the grassy areas next to the ocean, to make them more hurricane-friendly. They drew and presented sketches that showed how these areas could be used to absorb seawater. They also drew in things that could be planted to grow better in the changing environment, like plants that can withstand seawater. Others focused on important city buildings like hospitals. Hospitals in New York City were hit hard by the hurricane, and many people struggled to get the emergency care and basic medical help they needed during the disaster. The experts' drawings focused on ways to make hospital buildings stronger so that they could meet people's needs even in a crisis.

Others looked at how to improve public transportation, which is very important to keeping the city running. After the hurricane, many people in the city were stranded with no way to get around because the train system was badly affected by the storm. Transportation experts drew up ways to pump water out of train tunnels more quickly and get trains up and running sooner. People brought their drawings together and looked at all the ways to improve the city. Some ideas had to be rejected and replaced by more useful ones. The experts presented their ideas to the public at meetings because these changes would affect everyone living in the city and they wanted the citizens to be engaged in the process. Finally, the city was able to decide on a plan it would use to start making the city stronger, and it used these sketches and representations to figure out other things, like how much it would cost the city, how many workers would be needed and how long the construction projects might take. Using the teamwork of many experts and sketch artists, the city was able to begin planning New York City's future and work toward preventing potential dangers.

Questions

1. What did people use when discussing how to protect New York City against hurricanes?

a. drawings
b. medical help
c. seawater
d. construction projects

2. The threat of another hurricane is a problem for New York City. What have people done to help solve this problem?

a. People have moved to homes outside New York City.

b. People have built sculptures of New York City.

c. People have figured out ways to change New York City.

d. People have spent less money on public transportation in New York City.

3. When a hurricane hit New York City in 2012, the city was not fully prepared to handle it. What evidence from the passage supports this statement?

a. Drawings can help people exchange ideas with each other about how to solve problems, big or small.

b. Because drawings make ideas visible, they can be easier to understand than spoken or written explanations.

c. Sea levels are expected to keep rising, which means New York City may experience one or more hurricanes in the future.

d. Many people struggled to get medical help during the hurricane and were left without homes afterward.

4. What was one reason for using drawings when discussing improvements to New York City after the hurricane?

a. Some people prefer hearing an idea explained by an expert than seeing a drawing of that idea by a non-expert.

b. Drawings made it easier for many people to understand the improvements being discussed.

c. During the hurricane, many people in New York City were stranded and could not get the medical care they needed.

d. Some ideas that people came up with were not as good as others and had to be replaced.

5. What is this passage mainly about?

a. the damage that a 2012 hurricane did to hospitals and the train system in New York City

b. ideas that had to be rejected when figuring out ways to protect New York City from hurricanes

c. how grassy areas in New York City next to the ocean could be used to absorb seawater

d. ways to protect New York City from hurricanes and how drawings helped people discuss those ways

Variant 2

1. *Choose the correct active or passive form of the verb.*

1. Air pollution can *define / be defined* as the addition of something harmful to the air at a faster rate than 2. it can *absorb / be absorbed*. Everyone should be concerned about air pollution. 3. It *affects / is affected* us all, 4. and as it *continues / is continued* to worsen, so the environmental impact increases. One of the major causes of air pollution in cities is car usage. 5. Cars *use / are used* for even the shortest of journeys, 6. and all efforts by governments to encourage people *to use / to be used* public transport seem to be failing. Industry is another major cause of pollution in our cities, but fortunately, 7. new industrial sites *are building / are being built* away from large urban centers. 8. It *says / is said* that there are too many contributing factors for us to decide exactly which one is the main problem, but I believe that one of the most serious problems that needs tackling is the use of the car. 9. In some cities laws *have passed / have been passed* concerning car usage. 10. Athens, for example, only *allows / is allowed* a certain number of cars into the city center each day.

2. *Choose the correct verb form: modal verbs.*

1. They *had to / must* delay their research when the engineers came up against a technical problem. 2. You should *buy / have bought* a better telescope with the money you got on your birthday. This one isn't very good. 3. We *should / had better* check the modem. 4. You *need / should* have passed your biology exam. Why didn't you? 5. You *needn't have got / needn't get* a new screen; your old one was perfectly adequate. 6. They *should / were able to* have asked for help when they couldn't find the file. Why didn't they? 7. Lee *wasn't supposed / ought not* to work in the lab while his boss was away. 8. He *ought to / may to* have fixed the phone by now, so let's give him a ring. 9. The company *mustn't / doesn't have to* do any more trials on the vaccine because it has been declared safe. 10. You *mustn't / needn't* use dangerous chemicals without wearing gloves and safety glasses.

3. *Fill in the gaps with the appropriate words from the list.*

amendments, sustainable, expansion, conflict, enabled, images, ratio, disoriented, versions, mentally

1. After receiving a blow to the head, the player was confused and _____, and had to leave the game. 2. A copy of the suggested _____ has been sent to the members for their consideration. 3. The rapid _____ of e-commerce has radically changed the world of retail sales. 4. The flexible hours of my new job have _____ me to spend more time with my children. 5. It is important to _____ organize information in your head when studying. 6. We need to find a _____ energy source to replace our fossils fuels because eventually there won't be any oil or gas left. 7. George Bernard Shaw observed that there is only one religion, though there are a hundred _____ of it. 8.

In the best possible learning environment, the computer-student _____would be 1:1. 9. The _____ for fresh water is growing in many of the former Soviet republics, which share many of the same waterways. 10. Forming mental _____ of new vocabulary is a valuable aid in learning a second language.

4. ***Read the text and choose the best answer to the questions below.***

News Debate: Phone Patrol

Should the police be allowed to dig through people's cell phones? Police officers in California have a new way to fight crime. If they arrest someone who is carrying a cell phone, officers can dig through the phone's content, including text messages, voice mails, e-mails, calendars, and photos. In a 5-2 ruling, the California Supreme Court stated in December 2011 that police officers are allowed to "open and examine what they find" on an arrested person, without a warrant. A warrant is permission from a judge based on reasonable suspicion.

The decision came about as a result of a 2007 case, People v. Diaz. Sheriffs in California's Ventura County arrested Gregory Diaz, saying they saw him participate in a drug deal. The sheriffs took Diaz's cell phone from his pocket and scrolled through the text messages. They found one linking Diaz to the sale. Diaz was convicted. Later, however, he appealed the charges. He said that phone snooping violated the Fourth Amendment, which protects against unreasonable searches and seizures.

The California Supreme Court's verdict upheld Diaz's conviction. The court stated that, based on past rulings from the U.S. Supreme Court, police can indeed look through anything "immediately associated with a person." The two judges who voted against the verdict argued that cell phone searches are an invasion of privacy. They noted that smart phones can contain a wide variety of information about a person. Here are the arguments from people on both ends of the call.

Protection Over Privacy. The police need help keeping the streets safe, say supporters of cell phone searches. Officers in Shafter, Calif., note that the policy has already been helpful. "We were able to establish who [the arrested people] were in contact with. It helped us to find who may also be involved in that crime," Detective Chris Grider told Bakersfield's 23ABC. Some people also believe that the policy will deter people from committing crimes. "The police now have better means to find out if you're guilty," California resident Chris Eddy told San Diego 6 News. Furthermore, supporters of the ruling say it does not violate the Fourth Amendment. If you've already been arrested with reasonable evidence, they say, then it is fair for the police to search through anything on you.

Abuse of Power. Stop snooping through smart phones, argue opponents of the new ruling. "People could have ... pictures in there, like of their girlfriends, that they don't want somebody else to see, and it would be an invasion of privacy not only for them, but the other person also," California resident Valinten Perez told 23ABC. San Diego resident Jim Tharayil added that he thinks the policy

could be abused. He told San Diego 6 News that he can imagine police officers "using something else to pull you over and then using this to look through your cell phone." Justice Kathryn M. Werdegar, one of the judges who opposed the decision, says that police officers should have to obtain a warrant. It is unfair of police officers to "rummage at leisure through the wealth of personal and business information that can be carried on a mobile phone ... merely because the device was taken from an arrestee's person," she says.

Questions

1. Which amendment protects against unreasonable searches and seizures?
    a. the First Amendment
    b. the Second Amendment
    c. the Third Amendment
    d. the Fourth Amendment
2. The passage shows two sides of this debate: Should the police be allowed to dig through people's cell phones? According to the passage, all of these people are against the police being allowed to dig through people's cell phones except ……...
    a. Detective Chris Grider
    b. Justice Kathryn M. Werdegar
    c. Valinten Perez
    d. Gregory Diaz
3. What can you most likely conclude about Gregory Diaz after reading the passage?
    a. He was probably sentenced to jail.
    b. He wasn't actually guilty of a crime.
    c. He was related to one of the judges.
    d. He used to work as a police officer.
4. Read these sentences from the passage: "Diaz was convicted. Later, however, he appealed the charges." In this sentence, the word convicted means …….
    a. reported angry
    b. acted alone
    c. looked after
    d. found guilty
5. The author's purpose for writing this passage was all of the following EXCEPT
    a. to present evidence for both sides of the argument
    b. to let the reader come to his or her own conclusions
    c. to provide facts about the 2007 case People v. Diaz
    d. to offer convincing proof that one side is clearly right

Module 4

DEVELOPMENT POTENTIAL OF SCIENCE

Academic Word List: abstract, accurate, acknowledge, adapt, aggregate, aid, allocate, assign, attach, bond, brief, capable, cite, comprise, confirm, contrary, convert, couple, decade, definite, deny, differentiate, discriminate, display, dispose, diverse, domain, dynamic, edit, eliminate, empirical, enhance, equip, estate, exceed, expert, explicit, extract, fee, finite, flexible, foundation, furthermore, gender, globe, grade, guarantee, hierarchy, identical, ideology, ignorant, incentive, incidence, incorporate, index, infer, inhibit, initiate, innovate, input, insert, instruct, intelligent, interval, intervene, isolate, media, migrate, mode, nevertheless, overseas, paradigm, phenomenon, precede, resume, priority, prohibit, quote, rational, recover, release, reveal, reverse, scope, simulate, sole, somewhat, submit, subsidy, successor, survive, thesis, trace, transform, transmit, ultimate, underlie, unique, utilize, visible, voluntary.

GRAMMAR REVISION

Verb. Past Forms

1. ***Fill in the gaps with the correct form of the verbs in brackets: past simple, past perfect simple, or past perfect continuous.***

1. We no _____ *(sooner / start*) talking about Marion than she _____ *(appear)* in front of us. 2. By the time Francis _____ *(arrive*) at the café, we _____ *(finish*) our coffee and were ready to leave. 3. How long _____ *(you see*) Carol before you broke up with her? 4. It wasn't the first time she _____ *(fall for)* someone so insensitive. 5. We _____ *(only talk)* for a few minutes before we realized we'd become good friends. 6. As they _____ *(paint*) their new flat all day long, they were exhausted in the evening. 7. They didn't recognize me at first because they _____ *(never see)* me wearing a suit before. 8. Neither of them _____ *(have)* a long relationship before they started going out with each other. 9. I asked them about the rumor, but nobody _____ *(hear)* anything. 10. The babysitter went home with a headache because the children _____ *(make)* a noise the whole evening.

Verb. Future Forms

2. ***Fill in the gaps with the correct form of the verbs in brackets: future simple, future continuous, 'be going to', or present simple.***

1. What _____ (*do*) about that swelling on your hand? 2. I promise I _____ (*not touch*) the chocolate cake until you _____ (*get back*). 3. I'm afraid I (*train*) hard for the charity marathon for those two weeks, so I _____ (*not have*) any free time. 4. The children _____ (*definitely / enjoy*) a picnic in the forest. 5. There's too much oil in the pan. You _____ (*spill*) it all over the cooker. 6. Haven't we got any onions? Right, I _____ (*go*) to the greengrocer's to get some. 7. There _____ (*not be*) any ice cream left by the time they _____ (*get*) here. 8. I _____ (*have*) lunch at that fancy restaurant this time tomorrow. 9. That doesn't look very fresh. Surely, you _____ (*not eat*) it. 10. (*you peel*) the potatoes for me, please?

Reported Speech

3. *Complete the sentences by putting the verb into the correct form.*

1. She wanted to know which supermarket did I _____ ***(buy)*** my groceries from. 2. He said he _____ (*have)* to buy something for his computer. 3. They told us not _____ *(be)* late. 4. She says it _____ *(be)* the best store in town and that's why she doesn't shop anywhere else. 5. Anna told me she _____ (*have)* been working in the sales department for just over a year. 6. Brian said that he _____ (*must)* pay his next installment by Friday. 7. Paula asked me if she _____ (*can)* borrow my credit card. 8. The manager said she *(be)* back in an hour. 9. Marcus told us that he wished he _____ *(have to)* work at his uncle's bakery any more. 10. The assistant asked me _____ (*wait)* until his boss arrived.

4. *Choose the correct option.*

1. He denied *to steal / stealing* anything from the shop. 2. They suggested *visiting / to visit* the local market. 3. She insisted *for / on* buying brand names. 4. She accused me *of / for* damaging the shirt before I brought it back to the store. 5. They warned me against *to let / letting* the waiter take my credit card away from the table. 6. He *blamed / suspected* me for wasting money on things we didn't really need. 7. She *promised / admitted* to give me some extra money to spend on my birthday. 8. Her parents discouraged her *from / for* opening her own hairdressing salon. 9. She threatened *to tell / telling* the store detective that he'd stolen two expensive pens unless he gave her one. 10. The shop owner reminded them *not touching / not to touch* any of the vases on display.

Conditionals

5. *Fill in the gaps with the correct form of the verbs in brackets.*

1. They won't buy a new house unless it _____ (*make*) use of renewable energy. 2. You can help clean the beach on condition that you _____ (*not start*) fooling around. 3. If they hadn't built the

factory, the lake _____ (*not be*) polluted now. 4. Supposing they hadn't shut down the nuclear reactor, what _____ (*happen*)? 5. I _____ (*not live*) in a cold climate unless I had to. 6. _____ (*not swim*) in the river, or you'll get swept away by the current. 7. Suppose they decide to cut down the trees, what _____ (*you do*)? 8. The area wouldn't be flooded if the dam _____ (*not fail*) during the heavy rain. 9. When the plates move, the result (*be*) an earthquake. 10. If an earthquake hits and you are indoors, _____ (*not try*) to run out of the building. 11. If I _____ (*not see*) the ice melting so quickly, I wouldn't have believed it was happening. 12. If the water _____ (*not feel*) warm enough, don't go for a swim. 13. If the volcano erupted without warning, the locals _____ (*have*) little time to escape. 14. They might have been able to stop the oil from spreading if they _____ (*act*) more quickly.

READING AND SPEAKING

1. SCIENTIFIC ADVANCEMENTS

6. ***Read the text and answer the questions below it.***

Drones Become Mining's Flight to Safety

Jundee, Australia. Hundreds of feet underground here, scientists are experimenting with a technology that could transform how mining companies dig out rocks in dangerous, pitch-black caves: fully autonomous drones. The drones would fly without any pilot assistance into areas too risky for human miners. Using a rotating laser similar to those on autonomous cars, they would create three-dimensional maps more detailed than what is available now, helping miners excavate more gold and other commodities that might otherwise be missed. "It's very sci-fi," said Zachary McLeay, a production engineer for Australian gold producer Northern Star Resources Ltd., after seeing a drone fly into a dark cavern during a recent test.

The trial, at Northern Star's Jundee gold mine in Western Australia, is part of a broader effort by the global mining industry to embrace automation, which is driving down costs and improving safety. It also might lead to fewer jobs. Companies from South Africa to Australia are already using technology such as driverless trucks, mechanized drilling and extra-long conveyor belts to improve productivity as they look to rebound from the recent downturn in commodity prices. Automation can "save lives, and also save time and save money," said Mehmet Kizil, associate professor and mining-engineering program leader at the University of Queensland in Australia. "The industry is made a big jump in adopting this technology because the biggest cost in mining is labor." Drones have become a popular cost-saving measure in sectors as diverse as retail and insurance, and mining companies

regularly fly them to get aerial views of their facilities. But taking the machines underground represents a new frontier, and one fraught with risk.

Pitch-dark cavities can conceal dangers, such as falling rocks, with the potential to destroy drones that cost tens of thousands of dollars apiece. Adding to the challenge, a drone flying underground can't use satellite-navigation systems, such as GPS, like it could on the surface. Scientists and mining engineers say drones could be deployed to investigate large underground caverns after they are blasted open by explosives. The rock blasted out of these caverns is trucked to the surface, where it is crushed and gold is extracted.

Currently, surveyors must use a laser-mapping device attached to a boom, and stick it as far into the cavern as possible. But a laser attached to a fixed point can't capture everything, and it is too dangerous for human surveyors to go inside for a closer look. With a better map from a drone, miners could get a clearer picture of how much rock they have blasted out, modify their blasting technique if they aren't getting enough, and better plan the next cavern to blast. Drones could also collect maps of older sections of mines, making it easier to restart mining in those areas if commodity prices rise. In general, mining companies assume they can get 95% of the ore from underground using current methods, said Brad Valiukas, technical-services manager at Northern Star. Jundee alone is expected to produce more than $300 million in gold this fiscal year, so even a small improvement in efficiency is "a massive amount of money," Mr. Valiukas said.

In September, a team of researchers from Data61, part of the Australian government-funded Commonwealth Scientific and Industrial Research Organization, demonstrated at Jundee that a drone could fly by itself in an underground cavern where the pilot couldn't see it. But that means the pilot also couldn't intervene if something went wrong. "It's a pretty big step for us and it shows that this is feasible," said Stefan Hrabar, the Brisbane, Australia-based scientist who led the team. More work still needs to be done. Right now, researchers first must fly the drone with assistance from a pilot to build a preliminary map. Using the initial data, they can then program the drone to fly autonomously to certain locations. But the ultimate goal is a fully autonomous drone that can simply be taken underground and turned on, and then fly away to map a tunnel or cavern. Such drones could be tested in the next few months.

One of the riskier test flights Mr. Hrabar and his colleagues attempted at Jundee was an autonomous flight in a roughly 180-foot-tall cavern, the largest that had been blasted at the mine. "This is the moment of truth," said Farid Kendoul, another scientist on the team, just before the flight. The drone, whizzing on its six rotors, disappeared into the cave. It returned a few minutes later, though a hardware glitch required the pilot to help land the machine. Mr. Kendoul clapped his hands in the poorly lighted tunnel.

Questions

1. What technology are scientists in Australia experimenting with to improve mining?
2. How could fully autonomous drones help improve mining? Give at least two details from the text to support your answer.
3. What is the main idea of this text?
4. Why is it risky to try and use drones underground? Support your answer with evidence from the text.
5. Is it worth the risk and cost of developing new drone technology to use underground for mining? Support your argument with evidence from the text.

7. *Read the following essay and fill in the gaps with one of the words or phrases from the list. Express your own opinion on the essay whether you agree or disagree with the author.*

invented, research, innovations, Internet, email, life expectancy, breakthrough, technophobes, cybernetics, analyzed, safeguards, nuclear engineering, invented, genetic engineering, technophiles, experiment

Technology has come a long way in the last 50 years, and our lives have become better as a result. Or have they? The last 50 years have seen more changes than in the previous 200.

There have been many remarkable advances in medicine and medical technology that have helped to increase our average (1) _____ way beyond that of our ancestors. Incredible (2) _____ such as satellite television have changed the way we spend our leisure hours. Perhaps the most important (3) _____, however, has been the microchip. Nobody could have imagined, when it was first (4) _____, that within a matter of years, this tiny piece of silicon and circuitry would be found in almost every household object from the kettle to the video recorder. And nobody could have predicted the sudden proliferation of computers that would completely change our lives, allowing us to access information from the other side of the world via the (5) _____ or send messages around the world by (6) _____ at the touch of a button.

Meanwhile, (7) _____ into other aspects of information technology is making it easier and cheaper for us to talk to friends and relations around the world. Good news for (8) _____ who love modern technology, bad news for the (9) _____ who would prefer to hide from these modern miracles. But everything has a price. The development of (10) _____. led to mass automation in factories, which in turn led to millions losing their jobs. The genius of Einstein led indirectly to the threat of nuclear war and the dangerous uncertainties of (11) _____ (we hear of accidents and mishaps at nuclear power stations around the world, where (12) _____ to prevent accidents were inadequate).

The relatively new science of (13) _____ has been seen as a major step forward, but putting

modified foods on to the market before scientists had properly (14) _____ them was perhaps one of the most irresponsible decisions of the 1990s. Meanwhile, pharmaceutical companies continue to (15) _____ on animals, a move that many consider to be cruel and unnecessary. Of course, we all rely on modern science and technology to improve our lives. However, we need to make sure that we can control it before it controls us.

8. ***Group discussion on the topic "Science and its Development". Discuss the following statements in the group. Express and prove your opinions; support them with the examples from your experience.***

1. It is now recognized that scientific knowledge is more essential for wealth creation of nations today than either capital or land.
2. Energy storage is a huge challenge for modern technology (think about how often a smartphone needs charging), but particularly for renewable energy.
3. Forbes' suggestion that the Powerwall will kill nuclear power is probably overblown, but that this represents a radical development for the energy industry as a whole is beyond question.
4. If that sounds too prosaic, consider that 3D printing is a proposed solution for the challenges of building a colony on Mars. It might allow us to build using the materials already there, rather than transporting them 228 million kilometers at enormous expense. The stuff of science fiction? Yes, but 20 years ago, so was the idea of printing a house.
5. The possible consequences of using gene drives to combat malaria are frightening – the possibility of the target gene escaping into a different population, for instance, as well as unknown ramifications for the ecosystem as a whole.
6. Forbes' suggestion that the Powerwall will kill nuclear power is probably overblown, but that this represents a radical development for the energy industry as a whole is beyond question.
7. Cryonics (often incorrectly called cryogenics, which annoys physicists) is for most people the stuff of science fiction. Only a few hundred people have so far been cryonically preserved. We take the cryopreservation of human embryos for granted; we've been preserving human embryos cryonically for decades now.
8. Rather than combating climate change by reducing global demand for energy – a task that seems impossibly challenging – the development of effective nuclear fusion would solve the world's energy demands while averting climate catastrophe.

2. NATURAL AND MAN-MADE THREATS: SCIENTIFIC VIEW

9. ***Read the text and answer the questions below it.***

Nuclear Radiation Can Affect Our Health — For Better or Worse

You might not know exactly how to describe it, but chances are good that you know the word radiation can have two very different connotations. On the one hand, radiation exposure was one of the most feared consequences after an earthquake and a tsunami dam-sequence damaged a nuclear reactor in Japan earlier this year. On the other hand, radiation may have helped someone you know fight a disease such as cancer. How can one word have such different meanings?

All Around Us

Radioactive materials give off invisible atomic particles or energy called nuclear radiation. "Radiation is always around us," notes Dr. Ritsuko Komaki, a professor of radiation oncology at the MD Anderson Cancer Center in Houston. Very high exposures to nuclear radiation can cause sickness and, in the worst cases, death. But most radiation around us isn't something to worry about. Some normal amounts of nuclear radiation come from the sun, along with the sun's heat, visible light, ultraviolet rays, and more. Tiny bits of nuclear radiation are in soil too. "Usually it's a very low dose, and it's not harmful," says Komaki. Activities such as mountain climbing or taking a long airplane ride expose you to slightly more radiation - because you're closer to the sun. Experts generally don't worry about those exposures either.

Nuclear reactors, such as those at the Fukushima Daiichi plant in Japan that was damaged by the 2011 earthquake and tsunami, split uranium atoms. That action releases energy. The energy is used to boil water, which in turn creates steam that moves turbines that make electricity. When everything works, the process doesn't pollute the air or water. Nuclear plants' fuel and certain wastes, however, are radioactive. When emergency measures failed at Fukushima, explosions and fires released radioactivity into the environment. Cleanup will take years. Meanwhile, the accident has heightened fears about radiation.

Radiation's Risks

After a nuclear accident, radiation levels in the area of the nuclear plant can be thousands of times higher than they were before. Very high exposures cause acute radiation syndrome. Symptoms can range "from not feeling right to seizures and even loss of consciousness and death," says Dr. David Weinstock at Boston's Dana-Farber Cancer Institute. In addition to making people sick right away, too much radiation can damage cells and raise a person's risk of developing cancer later in life. In 1986, a nuclear power plant exploded in Chernobyl, Ukraine. Years later, thyroid cancer rates rose among young adults nearby. (The thyroid gland helps control the body's energy levels and other functions.) The young people had grown up drinking milk from cows that ate contaminated grass.

Authorities are checking radiation levels in various foods and water to prevent similar problems in Japan. The U.S. Food and Drug Administration (FDA) is also monitoring foods coming from Japan

to the United States. While scientists found slightly higher radiation on the West Coast after the Fukushima accident, amounts were way below danger levels. “The Fukushima event really poses no risk to people in the United States,” says Weinstock.

On the Plus Side

Nuclear radiation can help us get — and stay — healthy too. A special type of radiation is used to treat some meats, fruits, and vegetables to kill bacteria that can make people sick, for instance. In the same way that nuclear radiation’s energy can kill some of the body’s cells, it can also be used to kill cancerous tumors. “We are just targeting the cancer cells and protecting normal tissue surrounding the cancer,” explains Komaki, who primarily researches lung cancer. According to the National Cancer Institute, approximately half of all cancer patients receive some form of radiation therapy as part of their treatment.

Some forms of nuclear radiation can help doctors track down health problems in the first place. Torso X-rays and computed tomography (CT) scans use nuclear radiation to see inside the body. The benefits from being able to find health problems generally outweigh any tiny risks from exposure to radiation, but some accidents have happened. As a result, the FDA wants medical scanning equipment to have even more safeguards than it does now. Either way, experts say it’s a good idea to limit your exposure to nuclear radiation even when it’s part of a medical test. Always ask why any scan is necessary, especially if you think you have had that same test recently. “If there’s no justifiable reason for the extra radiation exposure, then don’t let yourself be exposed” if you can help it, says Kelly Classic, a health physicist at Minnesota’s Mayo Clinic and spokesperson for the Health Physics Society. Scientists and health experts around the globe continue to study nuclear radiation. They hope to harness its powerful benefits to continue to help people. When it’s used intentionally, radiation can be a boon to human health. “There are hundreds of thousands to millions of people who are alive today because we’ve harnessed the power of radiation,” says Weinstock.

Could It Happen Here?

The United States hasn’t had a major nuclear emergency since an accident closed Pennsylvania’s Three Mile Island power plant in 1979. Will an accident happen here again? “Nobody can answer that question,” says physicist Kelly Classic, a spokesperson for the Health Physics Society. But, she says, companies and communities are prepared. Power companies have regular safety drills for plants and nearby communities. People living nearby have access to emergency medicines such as potassium iodide in case of an accident. (That medicine temporarily blocks radioactive iodine from entering, and possibly harming, the thyroid gland.) Hospitals and emergency responders conduct regular drills on handling emergencies too.

Radon and Indoor Air

A radioactive gas called radon exists in soil all over Earth. It forms when naturally occurring radioactive materials such as uranium ring break down. Radon can seep into basements and floors, and buildup of the gas inside a home can make people sick. Treating some types of meat and produce with one type of nuclear radiation can prevent disease. The process, called food irradiation, uses "enough to destroy the bacteria, but not enough to destroy the quality or the nutritional content of the food," explains food scientist Christine Bruhn at the University of California, Davis. It doesn't make food radioactive - just as an X-ray won't make you radioactive.

Nonetheless, critics worry about possible accidents at processing plants. Detractors also say irradiation benefits farmers more than consumers. In their view, farms should avoid overcrowding in the first place—cramped conditions crowding on factory farms, they assert, stress animals and promote the types of disease that irradiation is then used to destroy. In any case, bacteria can still contaminate food after irradiation. The best way to prevent foodborne illness, whether the food has been treated borne with irradiation or not? Practice safe food handling at home.

Questions

1. What is one-way radiation is used that is beneficial for our health?
   a. To kill bacteria in foods that could make us sick.
   b. To disinfect surfaces like tables and door handles where bacteria often live.
   c. To zap our bodies with extra energy for sports and activities.
   d. To damage cells and eventually cause things like thyroid cancer.
2. In the article, how does the author describe radiation?
   a. as something to avoid at all costs
   b. as something that's less harmful than its reputation suggests
   c. as something that can be both good and bad
   d. as something that is helpful for human health and food safety
3. Which of the following conclusions about radiation is supported by the passage?
   a. Radiation is more harmful than helpful.
   b. Radiation is neither harmful nor helpful.
   c. Radiation is more helpful than harmful.
   d. Radiation is both helpful and harmful.
4. Read the following sentence: "You might not know exactly how to describe it, but chances are good that you know the word radiation can have two very different connotations." In this sentence the word connotations means …
   a. denotations
   b. meanings
   c. connections

d. implications

5. This passage deals primarily with …
   a. the ways that radiation can kill bacteria that may be present in foods.
   b. the effects, both positive and negative, that radiation can have.
   c. the fact that too much radiation can be harmful for our health, even causing cancer or death.
   d. why we should try to minimize our exposure to radiation.
6. How does radiation help doctors identify health problems in patients? (an open answer)
7. Why do you think the accident at Fukushima has "heightened fears about radiation"? (an open answer)
8. The question below is an incomplete sentence. Choose the word that best completes the sentence. The author describes both the negative and positive sides of radiation _____ people understand all sides of the issue.
   a. so
   b. but
   c. before
   d. because

10. ***Draw the table containing word families for the words from this Module Academic Word List. Complete Table 4.1. Sometimes more than one form may be possible. If you are unsure about a form, check Appendix 4. The first two words are done for you.***

Table 4.1. Word Families for Module 4 Academic Word List

Verb	*Noun*	*Adjective*	*Adverb*	*Participle I, II*
abstract	abstract(s) abstraction(s)	abstract	abstractly	abstracting abstracted
X	accuracy (-ies) inaccuracy (-ies)	accurate inaccurate	accurately	X

11. ***Fill in the gaps with the appropriate words from the list.***

accurate, cooperating, furthermore, ministered, traces, incorporated, instructions, intelligence, enhance, tape, exceeds, discriminate, attached, abstract, rational, flexible, presumed, incidence, motivated, authored

1. The suspect is _____ with police in the investigation. 2. Research shows that the transmission and _____ of disease can be reduced by vaccinations. 3. It is unrealistic to expect to be able to discuss _____ topics in a foreign language unless you are willing to spend a great deal of time in

second language study. 4. My hours are quite _____ in my job; as long as I get the work done, the administration doesn't care when I do it. 5. Changing your attitude from negative to positive may _____ your physical health. 6. Homeless people are fed and _____ to at various shelters in the cities. 7. When she didn't come to work, I simply _____ that she was sick. 8. Frank Tyger once remarked that discoveries are often made by not following _____, by going off the main road, by trying the untried. 9. My parents always _____ great value to my getting a good education. 10. Please don't put tacks in the wall; _____ is much better because it doesn't leave any holes. 11. Salesmen in the store are _____ to make sales by a 25% commission. 12. The ancient Egyptians thought that our hearts were the center of _____ and emotion. 13. It was hard to get an _____ count of the number of people in the room because there were so many people coming and going all the time. 14. Eating well is important for good health. _____, it helps to make you more attractive. 15. Rocket developer Krafft Ehricke once said that man has no _____ alternative but to expand the environmental and resource base beyond Earth. 16. Dr. Spock _____ a number of popular books on child raising in the 50s and 60s. 17. Our budget for the year _____ $100,000. 18. In 1911, IBM was _____ as the Computer-Tabulating-Recording Co., and produced clocks, scales, and punch card tabulators. 19. The first-place finisher was disqualified after _____ of steroids were found in his urine. 20. In the heat of a battle, it can be difficult to _____ between armed enemies and innocent civilians.

3. TECHNICAL ACHIEVEMENTS AS NATIONAL PRIDE

14. ***Read the text and do the exercises below it.***

The Rocket From East to West

A. The concept of the rocket, or rather the mechanism behind the idea of propelling an object into the air, has been around for well over two thousand years. However, it wasn't until the discovery of the reaction principle, which was the key to space travel and so represents one of the great milestones in the history of scientific thought, that rocket technology was able to develop. Not only did it solve a problem that had intrigued man for ages, but, more importantly, it literally opened the door to the exploration of the universe.

B. An intellectual breakthrough, brilliant though it may be, does not automatically ensure that the transition is made from theory to practice. Despite the fact that rockets had been used sporadically for several hundred years, they remained a relatively minor artefact of civilization until the twentieth century. Prodigious efforts, accelerated during two world wars, were required before the technology

of primitive rocketry could be translated into the reality of sophisticated astronauts. It is strange that the rocket was generally ignored by writers of fiction to transport their heroes to mysterious realms beyond the Earth, even though it had been commonly used in fireworks displays in China since the thirteenth century. The reason is that nobody associated the reaction principle with the idea of traveling through space to a neighboring world.

C. A simple analogy can help us to understand how a rocket operates. It is much like a machine gun mounted on the rear of a boat. In reaction to the backward discharge of bullets, the gun, and hence the boat, move forwards. A rocket motor's 'bullets' are minute, high-speed particles produced by burning propellants in a suitable chamber. The reaction to the ejection of these small particles causes the rocket to move forwards. There is evidence that the reaction principle was applied practically well before the rocket was invented. In his Noctes Atticae or Greek Nights, Aulus Gellius describes 'the pigeon of Archytas', an invention dating back to about 360 BC. Cylindrical in shape, made of wood, and hanging from string, it was moved to and for by steam blowing out from small exhaust ports at either end. The reaction to the discharging steam provided the bird with motive power.

D. The invention of rockets is linked inextricably with the invention of 'black powder'. Most historians of technology credit the Chinese with its discovery. They base their belief on studies of Chinese writings or on the notebooks of early Europeans who settled in or made long visits to China to study its history and civilization. It is probable that, sometime in the tenth century, black powder was first compounded from its basic ingredients of saltpetre, charcoal and sulphur. But this does not mean that it was immediately used to propel rockets. By the thirteenth century, powder propelled fire arrows had become rather common. The Chinese relied on this type of technological development to produce incendiary projectiles of many sorts, explosive grenades and possibly cannons to repel their enemies. One such weapon was the 'basket of fire' or, as directly translated from Chinese, the 'arrows like flying leopards'. The 0.7-meter-long arrows, each with a long tube of gunpowder attached near the point of each arrow, could be fired from a long, octagonal-shaped basket at the same time and had a range of 400 paces. Another weapon was the 'arrow as am flying sabre', which could be fired from crossbows. The rocket, placed in a similar position to other rocket-propelled arrows, was designed to increase the range. A small iron weight was attached to the 1.5m bamboo shaft, just below the feathers, to increase the arrow's stability by moving the center of gravity to a position below the rocket. At a similar time, the Arabs had developed the 'egg which moves and burns'. This 'egg' was apparently full of gunpowder and stabilized by a 1.5m tail. It was fired using two rockets attached to either side of this tail.

E. It was not until the eighteenth century that Europe became seriously interested in the possibilities of using the rocket itself as a weapon of war and not just to propel other weapons. Prior to this, rockets were used only in pyrotechnic displays. The incentive for the more aggressive use of rockets

came not from within the European continent but from far-away India, whose leaders had built up a corps of rocketeers and used rockets successfully against the British in the late eighteenth century. The Indian rockets used against the British were described by a British Captain serving in India as ‘an iron envelope about 200 millimetres long and 40 millimeters in diameter with sharp points at the top and a 3m-long bamboo guiding stick’. In the early nineteenth century, the British began to experiment with incendiary barrage rockets. The British rocket differed from the Indian version in that it was completely encased in a stout, iron cylinder, terminating in a conical head, measuring one meter in diameter and having a stick almost five meters long and constructed in such a way that it could be firmly attached to the body of the rocket. The Americans developed a rocket, complete with its own launcher, to use against the Mexicans in the mid-nineteenth century. A long cylindrical tube was propped up by two sticks and fastened to the top of the launcher, thereby allowing the rockets to be inserted and lit from the other end. However, the results were sometimes not that impressive as the behavior of the rockets in flight was less than predictable. Since then, there have been huge developments in rocket technology, often with devastating results in the forum of war. Nevertheless, the modern-day space programs owe their success to the humble beginnings of those in previous centuries who developed the foundations of the reaction principle. Who knows what it will be like in the future?

13. ***Choose the suitable headings for paragraphs A–E from the list of headings below (1–9).***

List of Headings

1. How the reaction principle works
2. The impact of the reaction principle
3. Writer's theories of the reaction principle
4. Undeveloped for centuries
5. The first rockets
6. The first use of steam
7. Rockets for military use
8. Developments of fire
9. What's next?

14. ***Choose the correct option (a, b, c or d) due to the text from Exercise 14.***

1. The greatest outcome of the discovery of the reaction principle was that ...
   a. rockets could be propelled into the air.
   b. space travel became a reality.
   c. a major problem had been solved.
   d. bigger rockets were able to be built.

2. According to the text, the greatest progress in rocket technology was made …

a. from the tenth to the thirteenth centuries.
b. from the seventeenth to the nineteenth centuries.
c. from the early nineteenth to the late nineteenth century.
d. from the late nineteenth century to the present day.

3. Match the inventions (1–5) and the people who first invented or used them (a–b).

1. rockets for displays
2. black powder
3. rocket-propelled arrows for fighting
4. rockets as war weapons
5. the rocket launcher

a. the Chinese
b. the Indians
c. the British
d. the Arabs
e. the Americans

15*. *Group discussion on the topic "Perspective of Development of your Scientific Field in Russia". Discuss this topic in the group. Express and prove your opinions; support them with the examples from your experience.*

4. THE MOST IMPORTANT SCIENTIFIC DISCOVERIES IN XX AND XXI CENTURIES

16. ***Read the text and answer the questions below it.***

Changing Our Understanding of Health

A. The concept of health holds different meanings for different people and groups. These meanings of health have also changed over time. This change is no more evident than in Western society today, when notions of health and health promotion are being challenged and expanded in new ways.

B. For much of recent Western history, health has been viewed in the physical sense only. That is, good health has been connected to the smooth mechanical operation of the body, while ill health has been attributed to a breakdown in this machine. Health in this sense has been defined as the absence of disease or illness and is seen in medical terms. According to this view, creating health for people means providing medical care to treat or prevent disease and illness. During this period, there

was an emphasis on providing clean water, improved sanitation and housing.

C. In the late 1940s the World Health Organization challenged this physically and medically oriented view of health. They stated that 'health is a complete state of physical, mental and social well-being and is not merely the absence of disease' (WHO, 1946). Health and the person were seen more holistically (mind / body / spirit) and not just in physical terms.

D. The 1970s was a time of focusing on the prevention of disease and illness by emphasizing the importance of the lifestyle and behavior of the individual. Specific behaviors which were seen to increase the risk of diseases, such as smoking, lack of fitness and unhealthy eating habits, were targeted. Creating health meant providing not only medical health care, but health promotion programs and policies which would help people maintain healthy behaviors and lifestyles. While this individualistic healthy lifestyle approach to health worked for some (the wealthy members of society), people experiencing poverty, unemployment, underemployment or little control over the conditions of their daily lives benefited little from this approach. This was largely because both the healthy lifestyles approach and the medical approach to health largely ignored the social and environmental conditions affecting the health of people.

E. During 1980s and 1990s there has been a growing swing away from seeing lifestyle risks as the root cause of poor health. While lifestyle factors still remain important, health is being viewed also in terms of the social, economic and environmental contexts in which people live. This broad approach to health is called the socio-ecological view of health. The broad socio-ecological view of health was endorsed at the first International Conference of Health Promotion held in 1986, Ottawa, Canada, where people from 38 countries agreed and declared that:

The fundamental conditions and resources for health are peace, shelter, education, food, a viable income, a stable eco-system, sustainable resources, social justice and equity. Improvement in health requires a secure foundation in these basic requirements. (WHO, 1986).

It is clear from this statement that the creation of health is about much more than encouraging healthy individual behaviors and lifestyles and providing appropriate medical care. Therefore, the creation of health must include addressing issues such as poverty, pollution, urbanization, natural resource depletion, social alienation and poor working conditions. The social, economic and environmental contexts which contribute to the creation of health do not operate separately or independently of each other. Rather, they are interacting and interdependent, and it is the complex interrelationships between them which determine the conditions that promote health. A broad socio-ecological view of health suggests that the promotion of health must include a strong social, economic and environmental focus.

F. At the Ottawa Conference in 1986, a charter was developed which outlined new directions for health promotion based on the socio-ecological view of health. This charter, known as the Ottawa

Charter for Health Promotion, remains as the backbone of health action today. In exploring the scope of health promotion it states that: Good health is a major resource for social, economic and personal development and an important dimension of quality of life. Political, economic, social, cultural, environmental, behavioral and biological factors can all favor health or be harmful to it. (WHO, 1986). The Ottawa Charter brings practical meaning and action to this broad notion of health promotion. It presents fundamental strategies and approaches in achieving health for all. The overall philosophy of health promotion which guides these fundamental strategies and approaches is one of 'enabling people to increase control over and to improve their health' (WHO, 1986).

Questions

1. In which year did the World Health Organization define health in terms of mental, physical and social well-being?
2. Which members of society benefited most from the healthy lifestyles approach to health?
3. Name the three broad areas which relate to people's health, according to the socio-ecological view of health.
4. During which decade were lifestyle risks seen as the major contributors to poor health?

17. ***Do the following statements agree with the claims of the text writer? There are three possible options (TRUE, FALSE, NOT GIVEN). Choose one option. Discuss your opinions with your groupmates.***

YES — if the statement agrees with the views of the writer;
NO — if the statement contradicts the views of the writer;
NOT GIVEN — if it is impossible to say what the writer thinks about this.

1. Doctors have been instrumental in improving living standards in Western society. The approach to health during the 1970s included the introduction of health awareness programs.
2. The socio-ecological view of health recognizes that lifestyle habits and the provision of adequate health care are critical factors governing health.
3. The principles of the Ottawa Charter are considered to be out of date in the 1990s. In recent years, a number of additional countries have subscribed to the Ottawa Charter.

18. ***Fill in the gaps with the appropriate words from the list.***

aggregates, expertise, diverse, revealed, bonds, briefly, acknowledging, nevertheless, indexed, transport, inhibits, transformation, lectured, interval, gender, ignorance, recovery, neutralizing, display, explicit.

1. Atoms form _____ with each other by sharing or exchanging electrons. 2. Doctors believe my

mother's quick _____ from her illness was partly due to her desire to see her grandchildren again. 3. Studies show that almost all animal societies _____ clear patterns of territorial, hierarchical, and sexual inequality. 4. Drinking milk is an effective way of _____ the burning feeling caused by eating spicy food. 5. Our company has built up a great deal of _____ in creating successful web-sites. 6. In 1215, Britain's King John was forced by his lords to sign the Magna Carta _____ that free men are entitled to judgment by their peers, and that even a sovereign is not above the law. 7. The longest _____ between the birth of two children on record is 41 years; a Welsh woman had a girl in 1956, and then a boy in 1997. 8. According to scientists, oysters can change from one _____ to another and back again depending on which is best for mating at a given moment. 9. China has undergone an incredible economic _____ in the last 20 years. 10. Books in the library are _____ by author, title, subject, and key word. 11. Gas and oil are very convenient forms of energy, simply because they are so easy to handle and _____. 12. We stopped driving _____ to have something to eat, and then set out again. 13. In general, a body of rock consists of mixtures or _____ of minerals. 14. Discrimination is usually based on _____ of other cultures or lifestyles. 15. The boss gave _____ instructions for the running of the company while he is away on holiday. 16. The sugar used in jams and jellies both sweetens the fruit and _____ the growth of bacteria. 17. The professor _____ us on current trends in Canadian literature. 18. The religion of Islam teaches the word of God as _____ to the Prophet Mohammed. 19. You may have failed the level, but your Spanish has improved a lot _____. 20. The former U.S.S.R. was composed of 15 very _____ republics with some cultural differences.

19. ***Fill in the gaps with appropriate words from the list.***

incentives, preceded, initiated, allocated, overseas, federal, capable, domain, migration, scope

1. My son is working _____ for an international oil company. 2. We have to choose a good _____ name for our website. 3. Canada has _____ elections every three or four years. 4. Joan is a much better worker than the fellow who _____ her in this job. 5. A recent report suggests that governments need to eliminate pricing systems that encourage oil use, and replace them with policies that provide _____ for alternative energy. 6. In Iraq over the past 50 years, there has been a widespread _____ of people to the urban centers. 7. In the 1980s, Deng Xiaoping _____ important economic reforms in China. 8. Due to the huge demand, tickets for the Olympic Games will be _____ using a lottery system. 9. Unfortunately, your question is outside the _____ of my experience in the field. 10. Do you think that a two-year-old child is _____ of knowing the difference between telling the truth and lying?

20. ***Group discussion on the topic "Life-Changing Science Discoveries". Discuss the following discoveries in the group. Express and prove your opinions; support them with the examples from your experience.***

The Copernicus System. In 1543, while on his deathbed, Polish astronomer Nicholas Copernicus published his theory that the Sun is a motionless body at the center of the solar system, with the planets revolving around it. Before the Copernicum system was introduced, astronomers believed the Earth was at the center of the universe.

Gravity. Isaac Newton, an English mathematician and physicist, is considered the greatest scientist of all time. Among his many discoveries, the most important is probably his law of universal gravitation. In 1664, Newton figured out that gravity is the force that draws objects toward each other. It explained why things fall down and why the planets orbit around the Sun.

Electricity. If electricity makes life easier for us, you can thank Michael Faraday. He made two big discoveries that changed our lives. In 1821, he discovered that when a wire carrying an electric current is placed next to a single magnetic pole, the wire will rotate. This led to the development of the electric motor. Ten years later, he became the first person to produce an electric current by moving a wire through a magnetic field. Faraday's experiment created the first generator, the forerunner of the huge generators that produce our electricity.

Evolution. When Charles Darwin, the British naturalist, came up with the theory of evolution in 1859, he changed our idea of how life on earth developed. Darwin argued that all organisms evolve, or change, very slowly over time. These changes are adaptations that allow a species to survive in its environment. These adaptations happen by chance. If a species doesn't adapt, it may become extinct. He called this process natural selection, but it is often called the survival of the fittest.

Louis Pasteur. Before French chemist Louis Pasteur began experimenting with bacteria in the 1860s, people did not know what caused disease. He not only discovered that disease came from microorganisms, but he also realized that bacteria could be killed by heat and disinfectant. This idea caused doctors to wash their hands and sterilize their instruments, which has saved millions of lives.

Theory of Relativity. Albert Einstein's theory of special relativity, which he published in 1905, explains the relationships between speed, time and distance. The complicated theory states that the speed of light always remains the same 186,000 miles/second (300,000 km/second) regardless of how fast someone or something is moving toward or away from it. This theory became the foundation for much of modern science.

Penicillin. Antibiotics are powerful drugs that kill dangerous bacteria in our bodies that make us sick. In 1928, Alexander Fleming discovered the first antibiotic, penicillin, which he grew in his lab using mold and fungi. Without antibiotics, infections like strep throat could be deadly.

DNA. On February 28, 1953, James Watson of the United States and Francis Crick of England

made one of the greatest scientific discoveries in history. The two scientists found the double-helix structure of DNA. It's made up of two strands that twist around each other and have an almost endless variety of chemical patterns that create instructions for the human body to follow. Our genes are made of DNA and determine how things like what color hair and eyes we'll have. In 1962, they were awarded the Nobel Prize for this work. The discovery has helped doctors understand diseases and may someday prevent some illnesses like heart disease and cancer.

Periodic Table. The Periodic Table is based on the 1869 Periodic Law proposed by Russian chemist Dmitry Mendeleev. He had noticed that, when arranged by atomic weight, the chemical elements lined up to form groups with similar properties. He was able to use this to predict the existence of undiscovered elements and note errors in atomic weights. In 1913, Henry Moseley of England confirmed that the table could be made more accurate by arranging the elements by atomic number, which is the number of protons in an atom of the element.

X-Rays. Wilhelm Roentgen, a German physicist, discovered X-rays in 1895. X-rays go right through some substances, like flesh and wood, but are stopped by others, such as bones and lead. This allows them to be used to see broken bones or explosives inside suitcases, which makes them useful for doctors and security officers. For this discovery, Roentgen was awarded the first-ever Nobel Prize in Physics in 1901.

Quantum Theory. Danish physicist Niels Bohr is considered one of the most important figures in modern physics. He won a 1922 Nobel Prize in Physics for his research on the structure of an atom and for his work in the development of the quantum theory. Although he helped develop the atomic bomb, he frequently promoted the use of atomic power for peaceful purposes.

Atomic Bomb. The legacy of the atomic bomb is mixed: it successfully put an end to World War II, but ushered in the nuclear arms race. Some of the greatest scientists of the time gathered in the early 1940s to figure out how to refine uranium and build an atomic bomb. Their work was called the Manhattan Project. In 1945, the U.S. dropped atomic bombs on the Japanese cities of Hiroshima and Nagasaki. Tens of thousands of civilians were instantly killed, and Japan surrendered. These remain the only two nuclear bombs ever used in battle. Several of the scientists who worked on the Manhattan Project later urged the government to use nuclear power for peaceful purposes only. Nevertheless, many countries continue to stockpile nuclear weapons. Some people say the massive devastation that could result from nuclear weapons actually prevents countries from using them.

HIV/AIDS. In 1983 and 1984, Luc Montagnier of France and Robert Gallo of the United States discovered the HIV virus and determined that it was the cause of AIDS. Scientists have since developed tests to determine if a person has HIV. People who test positive are urged to take precautions to prevent the spread of the disease. Drugs are available to keep HIV and AIDS under control. The hope is that further research will lead to the development of a cure.

WRITING

21. ***Write an academic essay on the topic "Are All Scientific Analyses Destructive?". Write at least 250 words.***

22. ***Translate one paragraph from the following text in the written form paying attention to its grammar, lexical, and stylistic peculiarities.***

The Discovery of Uranus

Someone once put forward an attractive though unlikely theory. Throughout the Earth's annual revolution around the sun, there is one point of space always hidden from our eyes. This point is the opposite part of the Earth's orbit, which is always hidden by the sun. Could there be another planet there, essentially similar to our own, but always invisible? If a space probe today sent back evidence that such a world existed it would cause not much more sensation than Sir William Herschel's discovery of a new planet, Uranus, in 1781. Herschel was an extraordinary man — no other astronomer has ever covered so vast a field of work — and his career deserves study. He was born in Hanover in Germany in 1738, left the German army in 1757, and arrived in England the same year with no money but quite exceptional music ability. He played the violin and oboe and at one time was organist in the Octagon Chapel in the city of Bath. Herschel's was an active mind, and deep inside he was conscious that music was not his destiny; he therefore, read widely in science and the arts, but not until 1772 did he come across a book on astronomy. He was then 34, middle-aged by the standards of the time, but without hesitation he embarked on his new career, financing it by his professional work as a musician. He spent years mastering the art of telescope construction, and even by present-day standards his instruments are comparable with the best.

Serious observation began 1774. He set himself the astonishing task of 'reviewing the heavens', in other words, pointing his telescope to every accessible part of the sky and recording what he saw. The first review was made in 1775; the second, and most momentous, in 1780–81. It was during the latter part of this that he discovered Uranus. Afterwards, supported by the royal grant in recognition of his work, he was able to devote himself entirely to astronomy. His final achievements spread from the sun and moon to remote galaxies (of which he discovered hundreds), and papers flooded from his pen until his death in 1822. Among these, there was one sent to the Royal Society in 1781, entitled An Account of a Comet.

On Tuesday the 13th of March, between ten and eleven in the evening, while I was examining the small stars in the neighborhood of H Geminorum, I perceived one that appeared visibly larger than the rest; being struck with its uncommon magnitude, I compared it to H Geminorum and the small star in the quartile between Auriga and Gemini, and finding it to be much larger than either of

them, suspected it to be a comet. Herschel's care was the hallmark of a great observer; he was not prepared to jump any conclusions. Also, to be fair, the discovery of a new planet was the last thought in anybody's mind. But further observation by other astronomers besides Herschel revealed two curious facts. For the comet, it showed a remarkably sharp disc; furthermore, it was moving so slowly that it was thought to be a great distance from the sun, and comets are only normally visible in the immediate vicinity of the sun. As its orbit came to be worked out the truth dawned that it was a new planet far beyond Saturn's realm, and that the 'reviewer of the heavens' had stumbled across an unprecedented prize. Herschel wanted to call it georgium sidus (Star of George) in honor of his royal patron King George III of Great Britain. The planet was later for a time called Herschel in honor of its discoverer. The name Uranus, which was first proposed by the German astronomer Johann Elert Bode, was in use by the late 19th century.

Uranus is a giant in construction, but not so much in size; its diameter compares unfavorably with that of Jupiter and Saturn, though on the terrestrial scale it is still colossal. Uranus' atmosphere consists largely of hydrogen and helium, with a trace of methane. Through a telescope the planet appears as a small bluish-green disc with a faint green periphery. In 1977, while recording the occultation 1 of a star behind the planet, the American astronomer James L. Elliot discovered the presence of five rings encircling the equator of Uranus. Four more rings were discovered in January 1986 during the exploratory flight of Voyager 2, In addition to its rings, Uranus has 15 satellites ('moons'), the last 10 discovered by Voyager 2 on the same flight; all revolve about its equator and move with the planet in an east — west direction. The two largest moons, Titania and Oberon, were discovered by Herschel in 1787. The next two, Umbriel and Ariel, were found in 1851 by the British astronomer William Lassell. Miranda, thought before 1986 to be the innermost moon, was discovered in 1948 by the American astronomer Gerard Peter Kuiper.

23*. *Write an academic essay on one of the following topics: "The Advances of Science in the 21st century"; "Science Will Never End"; "The Discovery I am Proud of". Write at least 250 words (see Appendix 2).*

SELF-STUDY ACTIVITIES

24. *Complete the passage putting the verb into the correct form.*

Following the request for minor revisions, we (1) carefully _____ *(analyze)* the comments we (2) _____ *(receive)* from the reviewers. We (3) _____ *(find)* all the comments very useful and we (4) _____ *(try)* to revise the paper accordingly. In this accompanying letter, we (5) _____ (*detail)* how we (6) _____ *(deal)* the reviewers' comments (quoted in italics), discussing how

these (7) _____ (*be addressed*). One particular change that should be considered is to make the paper less focused on one particular product. We (8) _____ (*agree)* with this point. We (9) _____ *(change)* the title, abstract and introduction so as to mention more the one product. The main product (10) now _____ *(be introduced)* only later when discussing the specific dataset and experiments reported in the paper. There are two papers, which are highly relevant to the work proposed in this paper: Papers D and Paper E. Given the reference limit in your journal, we (11) originally _____ (*decide)* to include only references to A and B. To enable us to incorporate D, we (12) _____ *(delete)* the reference to Paper C. Could you present the properties of the dataset you used in the new applications? To deal with this request we (13) _____ (*add)* a new table (Table 6) and figure (Figure 3). The plot in the new Figure 3 (14) _____ (*show)* the large amount of data currently available and… How did you calculate the Pearson correlation? The description is not very clear. We (15) _____ *(revise)* the description to make it clearer. In any case during our research we (16) _____ (*create)* a grid over the area under investigation, we (17) _____ (*sample)* the two distributions at the points of the grid, and then we (18) _____ (*compute)* the sample correlation coefficient to estimate the Pearson correlation. In conclusion, we (19) _____ (*hope)* that the paper will be suitable for publication in The Journal of…

25*. *Choose the correct option.*

1. Erica wishes she *would / could* write good detective stories. 2. They wish they *bought / had bought* a better security system. 3. I wish you *wouldn't / don't* dress like a gangster; it's so annoying. 4. Do you regret *stealing / to steal* that watch from your uncle? 5. If only we *didn't have to / hadn't had* to stay in after dark every day. 6. I wish we *lived / would live* in a safer neighborhood. 7. I wish we *were going / are going* to study law at the same university. 8. We regret *informing / to inform* you that your belongings cannot be returned to you. 9. He wishes he *didn't listen / hadn't listened* to his friend when he suggested breaking into a shop. 10. The residents wish there *are / were* more police patrols in the area.

26. *Change the sentences into reported speech. Give alternative tenses where possible.*

Example: *I broke my leg when I was skiing. → She said (that) she broke / had broken her leg when she was skiing.*

1. It's going to rain later today. → He thinks later today …
2. I don't think this is my coat. → She didn't think …
3. You must set the alarm when you leave the house. → She said …
4. Where have I left my handbag? → She couldn't remember …
5. I'm playing football this afternoon. → He said yesterday afternoon …

6. I won’t be able to give you a lift after all. → He said so I’ll have to take a taxi …

7. How much do you earn? → He wanted to know …

8. We might go to Italy in the summer. → She mentioned in the summer …

9. What shall I do with this painting? → He wanted to know …

27 *. *Fill in the gaps with the appropriate words from the list.*

differentiate, comprised, inferred, guarantee, contrary, reversible, extracted, empirical, global, phenomenon, insertion, definite, visibility, submissive, quote, mode, channels, survival, advocates, ultimatum

1. While the lung damage that smoking causes is not _____, quitting smoking prevents more lung damage from occurring. 2. Iraq said it didn't have any weapons of mass destruction, but the U.S. claimed it had _____ information. 3. Bill Gates once stated that the most meaningful way to _____ your company from the competition is to do an outstanding job with information. 4. Henderson e-mailed a couple of items to me for _____ in tomorrow’s agenda for our management meeting. 5. Difficult weather conditions can be hazardous for drivers because _____ is often reduced. 6. B.J. Gupta once observed that hard work doesn’t _____ success, but improves its chances. 7. At the most fundamental level, human social behavior is necessary to ensure human _____. 8. The two leaders have been in communication through regular diplomatic _____. 9. Estimates of the number of child laborers worldwide are difficult to obtain because governments are not keen to measure a _____ which is not supposed to exist. 10. Scientists have recently _____ DNA evidence from fossilized bone samples which suggests that Neanderthal man was not actually our ancestor. 11. The _____ method requires a duplication of results for experiments done by a variety of sources. 12. Our increasing _____ population is fueling a demand for more and better food. 13. Health _____ in the U.S. recently applauded the decision by the Los Angeles school district to ban the sale of soft drinks in schools. 14. Roderigo de Triana was the sailor who made the first _____ sighting of land in the New World on October 12, 1492, from Columbus' ship the Pinta. 15. I'll tell you what I think, but please don't _____ me on this. 16. You can play the game on-line in multi-user _____, which allows you to play against friends, or even people you don't even know. 17. The dog is very _____, and will roll on its back when another dog threatens it. 18. The boss gave him an _____; quit drinking or be fired. 19. We _____ from your improved state of health that you had started on a regular exercise program. 20. Human bones are _____ of 22% water.

28. *Read the text and give definition of the beam-operated traffic system.*

The Beam-Operated Traffic System

A. The number of people killed each year on the road is more than for all other types of avoidable deaths except for those whose lives are cut short by tobacco use. Yet road deaths are tolerated — so great is our need to travel about swiftly and economically. Oddly, modern vehicle engine design — the combustion engine — has remained largely unchanged since it was conceived over 100 years ago. A huge amount of money and effort is being channeled into alternative engine designs, the most popular being based around substitute fuels such as heavy water, or the electric battery charged by the indirect burning of conventional fuels, or by solar power. Nevertheless, such innovations will do little to halt the carnage on the road. What is needed is a radical rethinking of the road system itself.

B. The Beam-Operated Traffic System, proposed by a group of Swedish engineers, does away with tarred roads and independently controlled vehicles, and replaces them with innumerable small carriages suspended from electrified rails along a vast interconnected web of steel beams crisscrossing the skyline. The entire system would be computer-controlled and operate without human intervention. The most preferable means of propulsion is via electrified rails atop the beams.

C. Although electric transport systems still require fossil fuels to be burnt or dams to be built, they add much less to air pollution than the burning of petrol within conventional engines. In addition, they help keep polluted air out of cities and restrict it to the point of origin where it can be more easily dealt with. Furthermore, electric motors are typically 90% efficient, compared to internal combustion engines, which are at most 30% efficient. They are also better at accelerating and climbing hills. This efficiency is no less true of beam systems than of single vehicles.

D. A relatively high traffic throughput can be maintained — automated systems can react faster than can human drivers — and the increased speed of movement is expected to compensate for loss of privacy. It is estimated that at peak travel times passenger capacity could be more than double that of current subway systems. It might be possible to arrange for two simultaneous methods of vehicle hire: one in which large carriages (literally buses) run to a timetable, and another providing for hire of small independently occupied cars at a slightly higher cost. Travelers could order a car by swiping a card through a machine, which recognizes a personal number code.

E. Monorail systems are not new, but they have so far been built as adjuncts to existing city road systems. They usually provide a limited service, which is often costly and fails to address the major concern of traffic choking the city. The Beam-Operated Traffic System, on the other hand, provides a complete solution to city transportation. Included in its scope is provision for the movement of pedestrians at any point and to any point within the system. A city relieved of roads carrying fast-moving cars and trucks can be given over to pedestrians and cyclists who can walk or pedal as far as they wish before hailing a quickly approaching beam-operated car. Cyclists could use fold-up bicycles for this purpose.

F. Since traffic will be designated an area high above the ground, human activities can take place

below the transit system in complete safety, leading to a dramatic drop in the number of deaths and injuries sustained while in transit and while walking about the city. Existing roads can be dug up and grassed over, or planted with low growing bushes and trees. The look of the city is expected to improve considerably for both pedestrians and for people using the System.

G. It is true that the initial outlay for a section of the beam-operated system will be more than for a similar stretch of tarred road. However, costs for the proposed system must necessarily include vehicle costs, which are not factored into road-building budgets. Savings made will include all tunnels, since it costs about US $120,000 per kilometer to build a new six-lane road tunnel. Subway train tunnels cost about half that amount, because they are smaller in size. Tunnels carrying beamed traffic will have a narrower cross-sectional diameter and can be dug at less depth than existing tunnels, further reducing costs.

H. The only major drawbacks to the proposal are entrenched beliefs that resist change, the potential for vandalism, and the loss of revenue for car manufacturers. Video camera surveillance is a possible answer to vandalism, while the last objection could be overcome by giving car manufacturers beam-operated vehicle building contracts. 60% of all people on earth live in cities; we must loosen the immediate environment from the grip of the road-bound car.

29. ***Choose the suitable heading from the list of headings (1–9) for the paragraphs (A–H). Explain your choice.***

1. Returning the city to the people
2. Speed to offset loss of car ownership
3. Automation to replace existing roads
4. A safe and cheap alternative
5. The monorail system
6. Inter-city freeways
7. Doing the sums
8. The complete answer to the traffic problem
9. Cleaner and more efficient

30. ***Do the following statements agree with the claims of the text writer? There are three possible options (TRUE, FALSE, NOT GIVEN). Choose one option. Discuss your opinions with your groupmates.***

YES — if the statement agrees with the views of the writer;

NO — if the statement contradicts the views of the writer;

NOT GIVEN — if it is impossible to say what the writer thinks about this.

1. The combustion engine was designed over 100 years ago.
2. The increased speed of traffic in a Beam-Operated Traffic System is due to electric motors being 90% efficient.
3. Beamed traffic will travel through tunnels costing less to build than subway tunnels.
4. A possible solution to willful damage to the System is to install camera equipment.

31. ***Choose a scientific article in English concerning your own field of science from any valid information source (10 000 printed characters) and prepare its oral translation into Russian.***

32. ***Search the Internet and go to the libraries to find scientific and technical articles on the topics of Module 4. Analyze the gathered material, then prepare a 10-minute report on the chosen topic. Give a Power Point presentation in the group (see Appendix 1).***

MODULE TEST 4

Variant 1

1. ***Choose the correct verb form: conditionals.***

1. Most of these devices fulfil user expectations, otherwise users *would stop / would have stopped* buying them years ago. 2. If the government had not changed its tax rate, unemployment *will go / would go / would have gone* up again, and the state *will lose / would lose / would have lost* another $5 million in tax revenues. 3. Should we all help street beggars? *Will / Would* we be happier? *Will / Would* the planet be a better place? This paper investigates the risks and bene fits of donating to street beggars. 4. We investigated both men and women. We hypothesized that men *will perceive / would perceive / would have perceived* work colleagues to be the most important relations, whereas women *will perceive / would perceive / would have perceived* friends from outside work as having more importance. 5. Contrary to the literature, the climate change projections outlined in this paper *will cause / would cause / would have caused* a large reduction in temperatures in polar regions.

2. ***Choose the correct verb form: all forms.***

Three red flags (1) *are / were* identified that indicate that the time to leave for a woman to leave her man has come. These red flags (2) *are / were*: five burps per day, two channel-zapping sessions per day, and five games on the Playstation with friends per week. A large number of women (3) *have / had* doubts about the right moment for leaving their partner. Often women (4) *wait / waited* in hope for a change in their partner's habits. One hundred couples (5) *are / were* analyzed, recording their

daily life for six months. Women (6) *are / were* provided with a form to mark the moments of annoyance recorded during the day. Burps, channel-zapping sessions and games on the Playstation with friends (7) *have produced / produced* the highest index of annoyance. The probability of eliminating these habits (8) *is / was* found to significantly low when the three red flags (9) *have been / had been* operative for more than three months. Thus, these numbers (10) *provide / provided* a good indication of when the time to leave him has come.

3. *Fill in the gaps with the appropriate words from the list.*

graded, unique, successor, denied, paradigm, innovative, confirmed, released, equipped, aid

1. Everest was not _____ as the highest mountain peak on Earth until 1863. 2. A black bear was captured in the city and later _____ in a forested area about 100 miles from here. 3. The apples have been _____ according to size, color and taste. 4. In many developing countries, girls are marginalized and disadvantaged, and are _____ access to a quality education. 5. Seat belts are necessary even if your car is _____ with airbags. 6. The new _____ for a successful business is to encourage more input from the workers. 7. Boris Yeltsin prepared Vladimir Putin to be his _____ as the leader of Russia. 8. Benetton's _____ advertising techniques brought them a great deal of attention, both positive and negative. 9. While penguins cannot fly, they do flap their wings under water to _____ in swimming. 10. The meanings of _____ symbols, rituals, and institutions can be difficult to explain to different cultures.

4. *Read the text and answer the questions below it.*

Trash Talk: Price of Recyclables Sinks After China Bans U.S. Scrap

Some U.S. manufacturers are turning trash into treasure after a Chinese ban on imported waste flooded American scrapyards with paper and plastic. The import ban, announced in July, sent global prices for waste paper and plastic into a tailspin. Without access to their Chinese customers, U.S. waste and recycling firms are scrambling to find new buyers for the scrap they collect from curbside bins. But companies that use recycled materials to make things like cardboard, plastic bins, yarn and other goods are taking advantage.

"America has an endless supply of waste and it just got more endless," said Anthony Pratt, executive chairman of Pratt Industries, which uses 100% recycled material in its U.S. facilities to make boxes for Amazon.com Inc. as well as firms ranging from major manufacturers to pizza joints. Plunging scrap prices are also driving new demand for recycled materials, which usually have to compete with growing supplies of new plastic resin made cheaply from shale oil by U.S. plants.

On Wednesday, Target Corp., Procter & Gamble Co., Keurig Green Mountain Inc., Campbell

Soup Co., Coca-Cola Co's North America business and others agreed to require suppliers of industrial plastic items like crates and trash bins to use more "post-consumer" material.

Not all of those companies signed on because of China's ban, but falling scrap prices have made the requirement an easier pitch, said Dylan de Thomas with The Recycling Partnership, which organized the pledge. "It's the definite silver lining of this scrap ban," he said. For environmentally conscious firms like Unifi Inc., which manufactures yarn and packaging from recycled plastic bottles, China's new rules help keep down production costs. "By having more supply, we expect the upward price pressure [on recycled material] will be mitigated," said Eddie Ingle, Unifi's vice president of supply chain.

Over two-thirds of America's wastepaper exports and more than 40% of its discarded-plastic exports ended up in China last year. Paper and plastic scrap exports to mainland China topped $2.2 billion. China told the World Trade Organization that it wants to limit the entry of "foreign waste." Under new rules, China by year-end would ban imports of used plastics and restrict some paper-scrap imports.

U.S. buyers can't replace lost Chinese demand, said Bill Moore of Moore & Associates, a paper-industry consulting firm. It could take a while to build the domestic capacity needed to process our abundant scrap into new products, he said.

If China stands by its proposed restrictions, U.S. recycling businesses will need to invest in machinery to more stringently sort the waste they collect, said Bob Cappadona of Casella Recycling LLC, a waste-services company based in the Northeast. And it also means households will have to do a better job of sorting items headed for recycling, he added. Waste collectors say they are seeking out new scrap customers in other parts of Asia and Latin America. Still, they say China's purchasing power is needed in the global market. If recyclers can't find new markets, or places to store the scrap they collect, some waste could end up in a landfill, Mr. Moore said. "That's the ultimate disaster - you don't want to lose people's enthusiasm for doing recycling," he said.

Questions

1. American scrapyards are being filled with more paper and plastic. Who is now taking advantage of these extra recycled materials?
   a. Chinese customers that have use for recycled materials and waste.
   b. Companies that use recycled materials to make different kinds of goods.
   c. Companies that create a lot of plastic and paper waste.
   d. The owners of American scrapyards and collectors of plastic and paper waste.
2. What caused the amount of paper and plastic in American scrapyards to grow so quickly?
   a. A U.S. regulation that rewards waste production.
   b. An influx in companies that recycle materials.

c. aAChinese ban on importing waste.

d. A change in the way households recycle.

3. The lower prices for scrap could be a good thing for those who care about the environment. What evidence from the text supports this statement?

a. U.S. waste and recycling firms are working quickly to find new buyers for the extra scrap.

b. Lower scrap prices have made it easier for companies to use recycled material instead of new plastic.

c. More than two-thirds of America's wastepaper exports ended up in China last year, prior to the ban.

d. It could take a while for U.S. companies to build their ability to process all the extra scrap into new products.

4. Based on the article, what is a potential negative effect of a long-lasting Chinese ban on imported waste?

a. If recyclers can't find new buyers for all the extra scrap, they will have to invent new products that use recyclable materials.

b. If recyclers can't find new markets for all the extra scrap, the U.S. is likely to dispose of the scrap in the world’s oceans.

c. If recyclers can't find different buyers for all the extra scrap, companies in the U.S. may have to shoulder the costs.

d. If recyclers can't find new markets or storage places for all the extra scrap, some recyclable waste could end up in a landfill.

5. What is the main idea of this article?

a. Because of a Chinese ban on imported waste, the price of scrap is falling in the U.S., helping companies that use recycled materials to make new products.

b. Because of a U.S. ban on exported waste, the price of scrap is falling in the U.S., helping companies that use recycled materials to make new products.

c. Because of new U.S. regulations, the price of scrap is falling in the U.S., which could have negative consequences for the environment.

d. Because of new global regulations, the price of scrap is rising in the U.S., which could have negative consequences for U.S. businesses.

Variant 2

1. *Choose the correct verb form: conditionals.*

1. There is no doubt that if we do nothing, climate change (of any kind) *will have / would have* major

effects on our daily lives. 2. If we r*ealized / had realized* the danger in the past, we would have taken more precautions. 3. Assuming the program cost GBP 50 per teenager and that 35% of the participants *would stop / would have stopped* drinking alcohol. 4. We determined that the government *would save / would have saved* around GBP 50 million in the health service over the next 60 years. 5. In hindsight, we believe that the tests *would function / would have functioned* more effectively if we had taken more precautions in the cleaning process. 6. Thus the results *would reflect / would have reflected* a considerable difference with respect to those values reported in the literature. 7. Participants guessed which of the four candidates *will win / would win* the election. 8. They wondered whether this result *would be / would have been* affected by other factors including… 9. After the tests, many participants claimed that they *would answer / would have answered* differently if the aim of the experiment (10) w*ere explained / had been explained* to them more clearly beforehand.

2. *Choose the correct verb form: all forms.*

The three red flags that (1) *are / were* identified in our research — numbers of burps, zapping sessions, and Play station sessions — (2) *can / should* enable women to understand when they (3) *need / needed* to leave their partner. To counter any effects due to the nationality of the women involved (predominantly Italian in our sample), we (4) *currently do / are currently doing* tests in Russia. The results that we (5) *obtained / have obtained* so far for Russia seem to confirm our initial findings, but with an additional fourth flag: time spent studying for examinations. In addition, the timeframe for the flags to be operative in Russia (6) *is / was* two months, rather than the three months reported in this paper. We (7) *also plan / will also plan* to replicate our tests on a wider range of women and a longer time scale, thus increasing the sample base from 100 to 1,000, and increasing the recording of daily life annoyances from six months to twelve months. Future research for the community at large (8) *were to / will* be dedicated to doing analogous tests to enable men to see the signs of when they (9) *can / could* leave their woman, and for employees to identify when they (10) *would / should* leave their current employment.

3. *Fill in the gaps with the appropriate words from the list.*

comprehend, eliminate, media, ideology, foundations, decades, somewhat, adult, transmitting, publications

1. Many teenagers begin smoking in an attempt to look more _____. 2. Some people feel that coverage of violent crimes in the _____ often results in further crimes by those who wish to imitate what they see. 3. Your sister has changed _____ since she came back from college. 4. In order to understand our earth and the processes which operate upon it, one must attempt to _____ time

spans of millions of years. 5. Regular practice of yoga can help to _____ stress. 6. The company has a number of _____ including a popular sports magazine, and a new fashion magazine. 7. Teachers act as the major vehicle for _____ the school curriculum and associated values to children. 8. Workers who died during construction of the Great Wall of China were often simply buried in the _____. 9. Her acting career spanned several _____ and attracted fans of all ages.10. Edward Abbey once noted that growth for the sake of growth is the _____ of the cancer cell.

4. ***Read the text and answer the questions below it.***

Nuclear Radiation Can Affect Our Health For Better or Worse

All Around Us. Radioactive materials give off invisible atomic particles or energy called nuclear radiation. "Radiation is always around us," notes Dr. Ritsuko Komaki, a professor of radiation oncology at the MD Anderson Cancer Center in Houston. Very high exposures to nuclear radiation can cause sickness and, in the worst cases, death. But most radiation around us isn't something to worry about. Some normal amounts of nuclear radiation come from the sun, along with the sun's heat, visible light, ultraviolet rays, and more. Tiny bits of nuclear radiation are in soil too. "Usually it's a very low dose, and it's not harmful," says Komaki. Activities such as mountain climbing or taking a long airplane ride expose you to slightly more radiation - because you're closer to the sun. Experts generally don't worry about those exposures either. Nuclear reactors, such as those at the Fukushima Daiichi plant in Japan that was damaged by the 2011 earthquake and tsunami, split uranium atoms. That action releases energy. The energy is used to boil water, which in turn creates steam that moves turbines that make electricity. When everything works, the process doesn't pollute the air or water. Nuclear plants' fuel and certain wastes, however, are radioactive. When emergency measures failed at Fukushima, explosions and fires released radioactivity into the environment. Cleanup will take years. Meanwhile, the accident has heightened fears about radiation.

Radiation's Risks. After a nuclear accident, radiation levels in the area of the nuclear plant can be thousands of times higher than they were before. Very high exposures cause acute radiation syndrome. Symptoms can range "from not feeling right to seizures and even loss of consciousness and death," says Dr. David Weinstock at Boston's Dana-Farber Cancer Institute. In addition to making people sick right away, too much radiation can damage cells and raise a person's risk of developing cancer later in life. In 1986, a nuclear power plant exploded in Chernobyl, Ukraine. Years later, thyroid cancer rates rose among young adults nearby. (The thyroid gland helps control the body's energy levels and other functions.) The young people had grown up drinking milk from cows that ate contaminated grass. Authorities are checking radiation levels in various foods and water to prevent similar problems in Japan. The U.S. Food and Drug Administration (FDA) is also monitoring foods coming from Japan

to the United States. While scientists found slightly higher radiation on the West Coast after the Fukushima accident, amounts were way below danger levels. “The Fukushima event really poses no risk to people in the United States,” says Weinstock.

On the Plus Side. Nuclear radiation can help us get - and stay - healthy too. A special type of radiation is used to treat some meats, fruits, and vegetables to kill bacteria that can make people sick, for instance. In the same way that nuclear radiation’s energy can kill some of the body’s cells, it can also be used to kill cancerous tumors. “We are just targeting the cancer cells and protecting normal tissue surrounding the cancer,” explains Komaki, who primarily researches lung cancer. According to the National Cancer Institute, approximately half of all cancer patients receive some form of radiation therapy as part of their treatment. Some forms of nuclear radiation can help doctors track down health problems in the first place. Torso X-rays and computed tomography (CT) scans use nuclear radiation to see inside the body. The benefits from being able to find health problems generally outweigh any tiny risks from exposure to radiation, but some accidents have happened. As a result, the FDA wants medical scanning equipment to have even more safeguards than it does now. Either way, experts say it’s a good idea to limit your exposure to nuclear radiation even when it’s part of a medical test. Always ask why any scan is necessary, especially if you think you have had that same test recently. “If there’s no justifiable reason for the extra radiation exposure, then don’t let yourself be exposed” if you can help it, says Kelly Classic, a health physicist at Minnesota’s Mayo Clinic and spokesperson for the Health Physics Society. Scientists and health experts around the globe continue to study nuclear radiation. They hope to harness its powerful benefits to continue to help people.

Questions

1. What is one way radiation is used that is beneficial for our health?
    a. To kill bacteria in foods that could make us sick.
    b. To disinfect surfaces like tables and door handles where bacteria often live.
    c. To zap our bodies with extra energy for sports and activities.
    d. To damage cells and eventually cause things like thyroid cancer.
2. In the article, how does the author describe radiation?
    a. As something to avoid at all costs.
    b. As something that’s less harmful than its reputation suggests.
    c. As something that can be both good and bad.
    d. As something that is helpful for human health and food safety.
3. Which of the following conclusions about radiation is supported by the passage?
    a. Radiation is more harmful than helpful.
    b. Radiation is neither harmful nor helpful.
    c. Radiation is more helpful than harmful.

d. Radiation is both helpful and harmful.

4. Read the following sentence: “You might not know exactly how to describe it, but chances are good that you know the word radiation can have two very different connotations.” In this sentence the word connotations means … .

a. denotations.
b. meanings .
c. connections.
d. implications.

5. This passage deals primarily with … .

a. the ways that radiation can kill bacteria that may be present in foods.
b. the effects, both positive and negative, that radiation can have.
c. the fact that too much radiation can be harmful for our health, even causing cancer.
d. why we should try to minimize our exposure to radiation.

Module 5

SCIENCE IN EVERYDAY LIFE

Academic Word List: accommodate, adjacent, albeit, analogy, anticipate, assemble, assure, attain, behalf, bulk, cease, coherent, coincide, collapse, colleague, commence, compatible, compile, conceive, concurrent, confine, controversy, converse, convince, device, devote, diminish, distort, encounter, enormous, erode, ethic, format, forthcoming, found, incline, inherent, insight, integral, integrity, intermediate, intrinsic, invoke, levy, likewise, manual, mature, mediate, medium, mutual, nonetheless, notwithstanding, odd, ongoing, overlap, panel, passive, persist, pose, preliminary, protocol, qualitative, refine, reluctance, restrain, rigid, route, scenario, so-called, straightforward, subordinate, supplement, suspend, team, temporary, trigger, undergo, unify, violate, vision, whereby.

GRAMMAR REVISION

Participle. Participle Clauses. Verbs + That Clause

1. ***Choose the correct option to complete the sentences.***

1. The *hypothesized threshold / threshold hypothesized* by Sasaki and Takahashi is much lower than ours. 2. The *proposed solution / solution proposed* in the present paper has three main advantages. 3. The *obtained results / results obtained* can then be used to determine the cost. 4. The *considered samples / samples considered* were taken from three different sources. 5. This value concurs with the *found amount / amount found*. 6. The solutions of *treated samples / samples treated* were then added to the final mixture. 7. The solutions of *treated samples / samples treated* with this acid showed a completely different behavior. 8. The same components were found in all the *investigated samples / samples investigated*. 9. There is no doubt that the quality of *offered goods / goods offered* is inferior. 10. This is actually much higher than the *calculated value / value calculated* in Sect. 14.1.

2. ***Choose the correct option to complete the sentences.***

1. Never having *seen / seeing* a blue whale before, I had no idea of the sheer size of the creature. 2. We consider the tiger's survival *is / to be* essential. 3. *Having been studied / Having studied* more carefully in recent years, the clouded leopard has become better understood. 4. Looking into the sky, two ospreys *could be seen / we could see* two ospreys. 5. *Having not / Not having owned* a parrot, I can't say how easy they are to look after. 6. Seeing the deer had been injured, *it was taken to / I phoned* the wildlife rescue center. 7. While walking through the forest, *there were / we spotted* several rare birds. 8. *The deer caught / catching* in the fence made a full recovery. 9. Trained properly, *they make*

/ we make them good guard dogs. 10. The marine biologists *studied / studying* the fish gathered vital information about it.

Infinitive and *-ing* Forms

3. ***Rewrite these sentences using perfect infinitives.***

1. It seems that you misunderstood the directions. 2. We were sorry that we had upset her. 3. It seems that the rain has stopped. 4. I'm glad that I've got to know your family. 5. Max was disappointed that he had failed his exam. 6. We expect we'll have moved house before September. 7. Alice was very happy that she had left school. 8. I'm fortunate that I grew up bilingual. 9. It is believed that the terrorists have left the country. l0. It appears that the car was stolen last night.

4. ***Choose the correct option to complete the sentences.***

1. We did these tests *proving / to prove* our hypothesis. *2. Developing / To develop* this program entailed *carrying* / *to carry* out various tests. 3. One approach is *exploiting / to exploit* the vast range of software already available. 4. We would like you *participating / to participate* in our congress. 5. They expect *having / to have* their results ready by the end of the year. 6. It is difficult *proving / to prove* that $x = y$. 7. That $x = y$ is easy *proving / to prove*. 8. *Proving / To prove* that $x = y$ is straightforward. 9. But *going / to go* back to what you said earlier… 10. Could you explain that again *using / to use* different words?

5*. ***Choose the correct option to complete the sentences.***

1. *Having passing / For passing / To pass* this exam you need to study / for studying. 2. *To not fail / To don't fail / In order not to fail* I suggest that you study as much as possible. 3. *To carry / Carrying out* this request entails to do / doing a lot of research. 4. *To live / Living* in Europe is often easier than to live / living in Africa. 5. *To live / Living* well in Japan you need a high salary. 6. *Not to have / To don't have / Not having* access to email would be a problem for most people. 7. I visited the mosque before *to come / coming* to the conference. 8. This section is devoted *to analyze / analyzing* the production process. 9. This is dedicated *to provide / providing* a good service for everyone. 10. This article contributes *to understand / understanding* how the process works.

READING AND SPEAKING

1. IMPLEMENTATION OF SCIENTIFIC DISCOVERIES IN EVERYDAY LIFE

6. ***Read the text and answer the questions below it.***

Hard Disk Drive Technology

A few years ago, a query about the health of a person's hard disk drive would have been met with a blank stare. Nowadays, almost everyone is aware of this remarkable electronic storage medium that is part of every modern computer, even though most users remain ignorant of the complexity of hard drive technology. In the early days of computing, an information record of a computer' s memory content was kept on punched cards similar to the way in which an automated piano stores the key-note sequences on a piano roll. Later, magnetic tape was used to store electronic signals, and is still the favoured means of economically backing up the contents of hard drives. However, accessing information sequentially stored on tape is slow since the electronic data must be input through a fixed head in a single pass.

Hard disk drives solve this problem by incorporating a spinning platter on which magnetic data can be made accessible via a moving head that reads and writes information across the width of the disk. It is analogous to the way in which a person can choose to play a particular track on a CD player by causing the arm to move the head across the disk. The CD player is, in fact, necessarily similar in design to a hard drive, although there are significant differences in speed of data access.

Most modern hard drives incorporate several platters to further reduce the time spent seeking the required information. Also, some newer drives have two heads; one for reading, and a second head for writing data to disk. This separation of tasks enables much higher densities of magnetic information to be written on the platter, which increases the capacity of the hard drive.

There are three important ways in which the capacity of hard disks has been increased. First, the data code itself has been tightened with express coding techniques. Second, as previously noted, the head technology has been improved; and third, the distance between the heads and the platters has been greatly reduced. It is hard to believe, but the head can be made to pass over the magnetised platter at distances of less than 1 microinch (the width of a typical human hair is 5000 microinches). This is achieved by means of a special protective coating applied to the platter. Each of these three improvements enables speedier access to the data.

Hard drives are more commonplace than tape recorders these days, but it must be remembered that they are much more fragile. Treated with respect they may last a number of years, but they are quite easily damaged, often with disastrous consequences for the user, whose precious data can become lost forever. Dropping a drive is almost always fatal, as is passing an incorrect electrical current through one (by faulty connection). Dust and even extremes of temperature can cause failure. Yet, no physical damage can ever result from the input of data via the keyboard or mouse. Of course, over

time the magnetised coating on the platters will erode, yet this is almost entirely independent of the amount of use.

There are serious questions being raised about the direction of the future of electronic storage media. Some researchers claim that it would be wiser to invest more time and money in setting up systems for streaming data across networks of computers from centralised banks of information storage. This would avoid the need for each personal computer user to have his or her own copy of a software program resident on a local hard drive. Personal data files could be kept at a central storage unit, and be suitably protected from disaster by a failsafe backup system.

As the Internet becomes ever more pervasive, and the speed of access to other machines increases across our telephone lines, it might be possible to do away with local storage systems altogether.

Questions

1. Nowadays, hard disk drive technology is:
   a. less complex.
   b. part of every modern computer.
   c. expensive.
   d. not difficult to understand.
2. Magnetically-coated disks are one of many types of:
   a. sequential access information systems.
   a. b. information storage solutions.
   b. c. tape storage solutions.
   c. d. CD players.
3. Connecting a hard drive incorrectly usually:
   a. results in excess temperature.
   b. erodes the magnetized material on the platters.
   c. damages the keyboard or mouse.
   d. destroys the drive.
4. Keyboard or mouse use can easily cause:
   a. incorrect electrical currents.
   b. the magnetized coating on the platter to wear out.
   c. physical damage to the hard disk drive.
   d. none of the above.
5. In the future, a computer user might be able to access personal data files from:
   a. a central storage unit.
   b. a local hard drive.
   c. a software program.

d. the local bank.

6. Centralized banks of storage information could:

a. offer better protection of a user's data files.

b. stream data across telephone lines.

c. mean the end of local storage systems.

d. all of the above.

7. *Group discussion on the topic "Implementation of Information Technologies in our Everyday Life". Discuss the following statements in the group. Express and prove your opinions; support them with the examples from your experience.*

1. Implementation of Information technologies is the most drastic alteration in our lives.
2. The possibilities of innovative technological gadgets and machines.
3. The main ways technology impacts our daily life.

2. RESEARCH HAS IMPROVED OUR DAILY LIFE

8. *Read the text and answer the questions below it.*

Implementing the Cycle of Success

Within Australia, Australian Hotels Inc (AHI) operates nine hotels and employs over 2000 permanent full-time staff, 300 permanent part-time employees and 100 casual staff. One of its latest ventures, the Sydney Airport hotel (SAH), opened in March 1995. The hotel is the closest to Sydney Airport and is designed to provide the best available accommodation, food and beverage and meeting facilities in Sydney's southern suburbs. Similar to many international hotel chains, however, AHI has experienced difficulties in Australia in providing long-term profits for hotel owners, as a result of the country's high labour-cost structure. In order to develop an economically viable hotel organisation model, AHI decided to implement some new policies and practices at SAH.

The first of the initiatives was an organisational structure with only three levels of management - compared to the traditional seven. Partly as a result of this change, there are 25 percent fewer management positions, enabling a significant saving. This change also has other implications. Communication, both up and down the organisation, has greatly improved. Decision-making has been forced down in many cases to front-line employees. As a result, guest requests are usually met without reference to a supervisor, improving both customer and employee satisfaction.

The hotel also recognised that it would need a different approach to selecting employees who

would fit in with its new policies. In its advertisements, the hotel stated a preference for people with some 'service' experience in order to minimize traditional work practices being introduced into the hotel. Over 7000 applicants filled in application forms for the 120 jobs initially offered at SAH. The balance of the positions at the hotel (30 management and 40 shift leader positions) were predominantly filled by transfers from other AHI properties.

A series of tests and interviews were conducted with potential employees, which eventually left 280 applicants competing for the 120 advertised positions. After the final interview, potential recruits were divided into three categories. Category A was for applicants exhibiting strong leadership qualities, Category C was for applicants perceived to be followers, and Category B was for applicants with both leader and follower qualities. Department heads and shift leaders then composed prospective teams using a combination of people from all three categories. Once suitable teams were formed, offers of employment were made to team members.

Another major initiative by SAH was to adopt a totally multi-skilled workforce. Although there may be some limitations with highly technical jobs such as cooking or maintenance, wherever possible, employees at SAH are able to work in a wide variety of positions. A multi-skilled workforce provides far greater management flexibility during peak and quiet times to transfer employees to needed positions. The most crucial way, however, of improving the labour cost structure at SAH was to find better, more productive ways of providing customer service. SAH management concluded this would first require a process of 'benchmarking'. The prime objective of the benchmarking process was to compare a range of service delivery processes across a range of criteria using teams made up of employees from different departments within the hotel which interacted with each other. This process resulted in performance measures that greatly enhanced SAH's ability to improve productivity and quality.

The front office team discovered through this project that a high proportion of AHI Club member reservations were incomplete. As a result, the service provided to these guests was below the standard promised to them as part of their membership agreement. Reducing the number of incomplete reservations greatly improved guest perceptions of service.

In addition, a program modelled on an earlier project called 'Take Charge' was implemented. Essentially, Take Charge provides an effective feedback loop from both customers and employees. Customer comments, both positive and negative, are recorded by staff. These are collated regularly to identify opportunities for improvement. Just as importantly, employees are requested to note down their own suggestions for improvement. (AHI has set an expectation that employees will submit at least three suggestions for every one they receive from a customer.) Employee feedback is reviewed daily and suggestions are implemented within 48 hours, if possible, or a valid reason is given for non-implementation. If suggestions require analysis or data collection, the Take Charge team has 30 days

in which to address the issue and come up with recommendations.

Although quantitative evidence of AHI's initiatives at SAH is limited at present, the anecdotal evidence clearly suggest that these practices are working. Indeed AHI is progressively rolling out these initiatives in other hotels in Australia, whilst numerous overseas visitors have come to see how the program works.

Questions

1. What are the high costs of running AHI's hotels related to?
   a. to their management.
   b. to their size.
   c. to their staff.
   d. to their policies.
2. What does SAH's new organisational structure require?
   a. 75% of the old management positions.
   b. 25% of the old management positions.
   c. 25% more management positions.
   d. 5% fewer management positions.
3. The SAH's approach to organisational structure required changing practices in ...
   a) industrial relations
   b) firing staff
   c) hiring staff
   d) marketing
4. What was the total number of jobs advertised at the SAH?
   a) 70
   b) 120
   c) 170
   d) 280
5. Categories A, B and C were used to select ...
   a) front office staff
   b) new teams
   c) department heads
   d) new managers
6. What was the aim of selecting teams of employees? (open answer)
7. What was the collected information used to? (open answer)
8. In which way are the suggestions treated? (open answer)

9. ***Draw the table containing word families for the words from this Module Academic Word List. Complete Table 5.1. Sometimes more than one form may be possible. If you are unsure about a form, check Appendix 4. The first two words are done for you.***

Table 5.1. Word Families for Module 5 Academic Word List

Verb	*Noun*	*Adjective*	*Adverb*	*Participle I, II*
anticipate	anticipant(s) anticipation(s)	anticipatory	X	anticipating anticipated
integrate	integrator integral(s) integrality(-ies)	integral	integrally	integrating integrated

10. ***Fill in the gaps with the appropriate words from the list.***

coherence, controversial, duration, anticipation, relax, insights, medium, triggering, sphere, passively

1. The mother, although she didn't hit her child, sat by _____ as the father beat him. 2. The _____ of the recession will determine how many businesses are able to survive. 3. Everyone working in the _____ of education will be affected by the government's budget cuts. 4. In 1977, over 30 nations banned the use of artificial weather as a weapon of war, promising never to attack by _____ storms, earthquakes or tidal waves. 5. An overall theme will help to give your essay _____. 6. You shouldn't talk about _____ topics with people you don't know very well because it might start an argument. 7. We often read novels in an attempt to gain _____ into the human experience. 8. The children had trouble falling asleep on Christmas eve in _____ of the visit from Santa Claus. 9. The new _____ of online communication allows people to converse with a worldwide audience. 10. The government has decided to _____ the rules on foreign ownership of industry in order to boost the economy.

11. ***Fill in the gaps with the appropriate words from the list.***

restraint, subordinate, portion, unified, assuredly, militarization, coinciding, conversing, integral, erode

1. The students were quietly _____ among themselves as they waited for the exam to begin. 2. A new treatment for the disease is meeting with great success in its testing on animal subjects and _____ will soon enter human testing. 3. I want you to use some _____ when you talk to your boss about your concerns. 4. William Wordsworth wrote that the best _____ of a good man's life

are his little, nameless, un-remembered acts of kindness and of love. 5. An aging population and the low birth rate may _____ American competitiveness in industry over the next 20 years. 6. A _____ Thai kingdom was established in 1350. 7. David Suzuki notes that water is _____ to supporting and maintaining all life on this planet. 8. The university is having trouble setting its exam schedule, with a number of the proposed dates _____ with religious holidays. 9. The _____ of space would create a new and potentially devastating dimension to global conflicts. 10. Bud Wilkinson once noted that for a team to reach its potential, each player must be willing to _____ his personal goals to the good of the team.

12. ***Group discussion on the topic "The Difference Between Application and Implementation in Science and Every Day Life". Discuss this topic in the group. Express and prove your opinions; support them with the examples from your experience.***

3. INNOVATIVE EDUCATION: CHALLENGES AND SOLUTIONS

13. ***Read the text and find proofs that higher education is valuable nowadays.***

The Value of a College Degree

The escalating cost of higher education is causing many to question the value of continuing education beyond high school. Many people wonder whether the high cost of tuition, the opportunity cost of choosing college over full-time employment, and the accumulation of thousands of dollars of debt is, in the long run, worth the investment. The risk is especially large for low- income families who have a difficult timemaking ends meet without the additional burden of college tuition and fees. In order to determine whether higher education is worth the investment, it is useful to examine what is known about the value of higher education and the rates of return on investment to both the individual and to society.

The Economic Value of Higher Education

There is considerable support for the notion that the rate of return on investment in higher education is high enough to warrant the financial burden associated with pursuing a college degree. Though the earnings differential between college and high school graduates varies over time, college graduates, on average, earn more than high school graduates. According to the Census Bureau, over an adult's working life, high school graduates earn an average of $1.2 million; associate's degree holders earn about $1.6 million; and bachelor's degree holders earn about $2.1 million (Day and Newburger, 2002).

These sizeable differences in lifetime earnings put the costs of college study in realistic perspective. Most students today — about 80 percent of all students — enroll either in public four-year colleges or in public two-year colleges. According to the U.S. Department of Education report. Think College Early, a full-time student at a public four-year college pays an average of $8,655 for in-state tuition, room, and board (U.S. Department of Education, 2002). A full-time student in a public two-year college pays an average of $1,359 per year in tuition (U.S. Department of Education, 2002).

These statistics support the contention that, though the cost of higher education is significant, given the earnings disparity that exists between those who earn a bachelor's degree and those who do not, the individual rate of return on investment in higher education is sufficiently high to warrant the cost.

Other Benefits of Higher Education

College graduates also enjoy benefits beyond increased income. A 1998 report published by the Institute for Higher Education Policy reviews the individual benefits that college graduates enjoy, including higher levels of saving, increased personal/professional mobility, improved quality of life for their offspring, better consumer decision making, and more hobbies and leisure activities (Institute for Higher Education Policy, 1998). According to a report published by the Carnegie Foundation, nonmonetary individual benefits of higher education include the tendency for postsecondary students to become more open-minded, more cultured, more rational, more consistent, and less authoritarian; these benefits are also passed along to succeeding generations (Rowley and Hurtado, 2002). Additionally, college attendance has been shown to “decrease prejudice, enhance knowledge of world affairs and enhance social status” while increasing economic and job security for those who earn bachelor’s degrees (Ibid.). Research has also consistently shown a positive correlation between completion of higher education and good health, not only for oneself, but also for one’s children. In fact, “parental schooling levels (after controlling for differences in earnings) are positively correlated with the health status of their children” and “Increased schooling (and higher relative income) are correlated with lower mortality rates for given age brackets” (Cohn and Geske, 1992).

The Social Value of Higher Education

A number of studies have shown a high correlation between higher education and cultural and family values, and economic growth. According to Elchanan Cohn and Terry Geske (1992), there is the tendency for more highly educated women to spend more time with their children; these women tend to use this time to better prepare their children for the future. Cohn and Geske (1992) report that “college graduates appear to have a more optimistic view of their past and future personal progress.”

Public benefits of attending college include increased tax revenues, greater workplace productivity, increased consumption, increased workforce flexibility, and decreased reliance on government

financial support (Institute for Higher Education Policy, 1998). While it is clear that investment in a college degree, especially for those students in the lowest income brackets, is a financial burden, the long-term benefits to individuals as well as to society at large, appear to far outweigh the costs.

14. ***Do the following statements agree with the views of the text writer? There are three possible options (TRUE, FALSE, NOT GIVEN). Choose one option. Discuss your opinions with your group-mates.***

1. The cost of a college education has remained steady for several years.
2. Some people have to borrow large amounts of money to pay for college.
3. About 80 percent of college students study at public colleges.
4. Public colleges cost less than private colleges.
5. Five benefits which college graduates may enjoy more of as compared to noncollege graduates are mentioned in the text.

15. ***Fill in the gaps with the appropriate words from the list.***

forthcoming, so-called, depression, likewise, assemble, extrinsic, persistent, whereby, compiled, odd

1. In case of a fire or some other emergency, we will all _____ on the grass outside the building. 2. The _____ increase in housing prices in this city is keeping many young families from buying their own homes. 3. The government wants to encourage home care of the elderly _____ they can receive personal medical care in the comfort of their home. 4. Greek historian Dionysius _____ a 20-volume history of Rome. 5. Most people experience some form of _____ at some point in their lives. 6. The prime minister has announced that he will retire before the _____ election. 7. What an _____ question. Why are you asking me that? 8. The _____ compromise they are suggesting gives them practically everything they want, and leaves us with almost nothing of what we want. 9. The comments he made were totally _____ to the discussion at hand. 10. Make sure you wash the kitchen floors, and _____ the floors in the bathroom.

4. PREPARATION FOR DEFENDING MASTER'S THESIS

16. ***Read the text and be ready for group discussion on the topic «Points About Defending a Thesis or Dissertation». Discuss the points in the group. Express and prove your opinions; support them with the examples from the text and your experience.***

Guidelines: Writing the Master's Thesis

The guidelines below provide basic information on writing a Master's Thesis paper. The Chair of the student's Master's Committee may have different expectations than the ones spelled out below. The student is responsible for finding out the expectations of his/her Chair at the outset.

I. Forming the Master's Committee.

The Master's Committee consists of the Chair and two additional faculty members. The student is responsible for approaching faculty members to form the Master's Committee, starting with contacting the Chair of the Committee.

It is strongly advisable that the Chair be a faculty member whose course directly pertains to the Master's project topic and whose course the student has successfully completed. In addition, it would be helpful if the student has taken a 6000-level course with one or both of the committee members and/or they are instructors of fields that closely relate to the Thesis topic. This committee composition would best support the successful completion of the Thesis, since the student will then have strong foundation in the relevant field(s) and will be prepared to do research on the specific topic. If the Thesis topic does not fall in the subjects studied in one of the courses taken by the student, then the student will have to first become proficient in the general field that pertains to the specific topic and then review the narrow literature on the specific question. As a result, this latter approach is more time consuming and difficult to undertake. By the same token, a faculty member may be reluctant to chair such a Master's Thesis.

II. Basic Features of a Master's Thesis.

The Master's Thesis is a research paper that is more substantial than a term paper for a 6000-level course. Depending on the topic and methodology, it can range from 25 pages to 75 pages, exclusive of any tables or figures and the list of references. Thesis that entail extension of a mathematical model will tend to be shorter than those that rely on applied econometrics or descriptive statistical analysis, or the Thesis that rely on interpretive methodologies (for example, history of thought in any field).

The Master's Thesis goes beyond a literature review on the narrow topic in a field. It will have to build upon and extend the relevant literature in the field. The relevant literature is likely to be covered in one or more of the 6000-level courses in the Master's program. The project should discuss this literature as background to the more detailed literature that pertains specifically to the project.

The Master's Thesis entails a contribution to the literature in the field. Thus the student has to identify a gap in the literature, through the discussion of the literature, which the Thesis then fills through the use of the appropriate research methodology. In empirical research papers, typical contributions entail an evaluation of either new or more recent data sources and/or application of a new

methodology. For example, the contribution of an empirical paper could be to update an existing regression (or descriptive statistical) analysis using data for recent years. The contribution of a theoretical paper, on the other hand, may be a new interpretation of the literature taking into consideration the latest writings on the subject.

The Master's Thesis should have the standard sections of a research paper, each of which addresses basic questions:

1. Introduction.
   What is the project about?
   Why is this an important research question?
   How will you analyze this issue?
2. Literature Review.
   What do we already know about this issue? (What have others said and provided evidence for?)
3. Methodology.
   How will you examine this issue?
4. Discussion of Results.
   What are the main findings of the project?
   In what ways do these modify/add to the existing literature?
5. Conclusions.
   What are the theoretical or policy implications of these findings?
   What are the fruitful research directions on this topic?
6. References.
   Which sources did you consult?
7. Appendix (for example, description of datasets; robustness checks of econometric analysis).

17. ***Fill in the gaps with the appropriate words from the list.***

rigidities, format, protocol, vision, manual, suspension, devotions, behalf, incompatible, mutual

1. Our Muslim students are permitted to leave class early on Fridays to practise their _____. 2. Canadian sprinter Ben Johnson received a lengthy _____ from international competition after testing positive for steroids at the Seoul Olympics. 3. Many game shows in countries around the world follow the same _____ as popular American game shows. 4. Because of the church's treatment of Galileo, many people suggest that religion is _____ with science. 5. What exactly is the proper _____ for making a complaint against a professor at this university? 6. The environmental award was accepted by a grade 12 student on _____ of the school. 7. _____ dependencies develop through the process of social interaction. 8. Some analysts suggest that _____ in the labor and

goods markets are to blame for Europe's poor economic performance. 9. After he fell while skating, he found that he was dizzy, and his _____ was blurred. 10. I learned how to drive on a transmission, so driving an automatic is easy for me.

18*. *Read the text and render it in English.*

The Writing Process

The student should be in regular communication with his/her Chair, keeping the Chair up-to-date on his/her progress in the form of e-mail contact and/or print-outs of list of potential sources, statistical output (if relevant), and drafts of the paper. This interaction and the approval of each step facilitate student success. The student should absolutely avoid bringing his/her master's project draft paper to the Chair in the last month of the expected graduation semester, without having consulted the Chair on the Project in the preceding months. Turning in a draft paper does not guarantee either approval of the project or graduation in that semester.

I. Writing the Introduction

The Introduction section should include the following:

An overview of the research problem.

Why this problem is worth exploring (spelling out the main positions in the literature to situate the problem, and, if relevant, your personal interest in it). What contribution your research is likely to make to the literature (the gap you will fill).

In about two pages you should be moving from laying out the broad context for the study to the narrowly-focused definition of the problem/research question.

The wording of the narrowly-focused research question should be explicit and be clear to even the most inattentive reader. For example, "I will be examining the extent to which microcredit has enabled the twin goals of poverty alleviation and women's empowerment in Kenya." Notice the choice of "extent to which" over "whether" to allow for a more wide-ranging discussion of the outcomes of microcredit.

It is O.K. to cite one or more studies that are either directly relevant or that inspired this research project or provide the justification for the study, but the Introduction is not where one evaluates these studies.

Invariably, one cannot write the final version of the Introduction section before completing the Literature Review and Methodology sections. Bear in mind that this section (along with the Conclusion section) will probably be the last section of the research paper to be completed.

II. The Literature Review

A. Your Main Objective: The purpose of your literature review is to justify your research project by evaluating the state of knowledge on the topic (that is, what we already know, what is contested,

what we don't know). It provides the context for your study. It is the responsibility of the researcher to identify the relevant literature (that is, the most influential theories/writing on the topic, the methods used, the findings/conclusions), be familiar with these, and locate their own study in relation to the literature.

B. Identifying your argument and the evidence you need: A literature review is the necessary step to identify your argument/specific hypothesis and to develop your guide for gathering the evidence to examine this argument/hypothesis. At the outset—in the Fall semester of your second year—you are likely to have a "working hypothesis" based on reading a small number of articles and/or your personal experiences. Through reading and evaluating the relevant literature, the working hypothesis has to develop into a refined argument/hypothesis, by your becoming more informed about what others have argued or shown and your reactions to what they have said. You will also become informed about the types of methodology others have used and be able to identify your own methodology (e.g. what kind of variables you might need statistics on, what kind of empirical methodology is necessary and feasible--given your strengths and the time frame and the data availability; or what kinds of text you will be interpreting). Note: "evidence" covers a broad range of sources—from statistics to texts—depending on your methodology.

C. Identifying the Basic Trends and Patterns in the Literature:

In your literature review your strategy is to identify the main trends and patterns in the articles/books you read.

Pay attention to the following:

What theories seem to be referred to/used most often?

What are the common assumptions most researchers are making?

What are the common methods used?

What are the points of agreement/disagreement among the authors?

How has each scholar contributed with their work—are they the first to apply a particular method, first to survey a particular group, first to make a particular argument, and by doing so, how have they advanced the debate on the subject (shifted the question of interest etc.)?

Do any other researchers share your views (your "working thesis")?

How has the literature on the topic evolved in recent years?

In your evaluation of the literature you should evaluate content for its application to your research (which you identify in the last column of the table above). Your literature review does not necessarily include everything you have read on the topic. For each potential reference ask yourself: "Why am I including this reference?" The answer has to indicate how it helps build your argument. You want to include it because, for example, it makes a similar argument or it is an argument you are disagreeing with or it illustrates a weakness that you propose to overcome with research.

D. The Relevant Literature:

Levels of Relevance: The literature that is relevant to your research project is likely to be of three types that will demand differing amounts of attention and space in your review. Example:

Background: You need to acknowledge these writings but not summarize them at length or in detail. These studies pertain to one aspect or "variable" in the research question. For the microcredit in Kenya paper, for example, studies that describe the shift in development policy toward neoliberal macroeconomic policies would be background literature. You may discuss key studies emphasizing that promotion of microcredit with its emphasis on self-employment, entrepreneurship, individual solutions, is consistent with market reforms and privatization.

Somewhat relevant: you need to provide a greater attention to this literature but not evaluate these studies in critical detail. For example, the literature on poverty reduction policies in developing countries.

The most relevant: You need to provide careful examination of these; these could be a set of studies that directly pertains to the research project. For example, studies on microcredit, quickly moving from a few well known South Asian studies to focus in depth on Sub-Saharan Africa. (see the type of thematic evaluation illustrated above).

Thus, your thematic literature review would move from general statements on the background literature to the detailed evaluation of the most relevant literature progressively providing more detailed, critical evaluation of the existing studies. In the figure from Hubbuch, the top triangle, narrowing to a tip, symbolizes this aspect of your literature review.

III. Methodology

This is the section that lays out how you will go about examining the research problem. You describe the methodology and the data you will use. The common methodologies used in Economics Master's Projects are applied econometrics, descriptive statistical analysis, an interpretive methodology that relies of various texts as data sources. In the example of the microcredit in Kenya project you would examine various studies on microcredit and might tabulate the key features and outcomes of these microcredit programs in Kenya.

IV. Discussion of Results

This section would include your analysis and what you find. If you are pursuing a statistical methodology, then this section would include the statistical analysis (for example, the regression analysis) and discuss the findings.

V. Conclusions

This section sums up the main findings of the study and then discusses the implications of the study. The conclusion section is more than a reiteration of the research findings. The implications could be at the theoretical, empirical or policy levels. For example, the conclusion of the microcredit

project could entail discussion of fruitful avenues for making microcredit projects more successful in the African context, based on your study. This section could also identify gaps that future research could examine, such that your research points the way to further studies.

19. ***Group discussion on the topic "Defending Master's Thesis is a Challenge". Discuss the following statements in the group. Express and prove your opinions; support them with the examples from your experience.***

1. Master`s thesis represents a student`s collective understanding of his/her program and major.
2. Completing your research and resulting paper demand your full attention.
3. "Defending" implies aggressive arguing about his or her work.
4. A proper thesis defence gives you and your faculty advisers the chance to discuss your topic and research in greater detail.
5. Defending your master`s thesis will give you confidence to speak up in front of others, a skill that will serve you throughout your career.

WRITING

20. ***Write an academic essay on the topic "Science and its Development or Perspectives". Write at least 250 words (see Appendix 2).***

21*. ***Translate one paragraph from the following text in the written form paying attention to its grammar, lexical, and stylistic peculiarities.***

Highs & Lows

Hormone levels — and hence our moods — may be affected by the weather. Gloomy weather can cause depression, but sunshine appears to raise the spirits. People may become so depressed and lacking in energy that their work and social life are affected. This condition has been given the name SAD (Seasonal Affective Disorder). Sufferers can fight back by making the most of any sunlight in winter and by spending a few hours each day under special, full-spectrum lamps. These provide more ultraviolet and blue-green light than ordinary fluorescent and tungsten lights. Scientists are working to discover the links between the weather and human beings' moods and performance.

It is generally believed that tempers grow shorter in hot, muggy weather. There is no doubt that 'crimes against the person' rise in the summer, when the weather is hotter and fall in the winter when the weather is colder. Research in the United States has shown a relationship between temperature and street riots. The frequency of riots rises dramatically as the weather gets warmer, hitting a peak

around 27…30 °C. But is this effect really due to a mood change caused by the heat? Some scientists argue that trouble starts more often in hot weather merely because there are more people in the street when the weather is good.

Psychologists have also studied how being cold affects performance. Researchers compared divers working in icy cold water at 5 °C with others in water at 20°C (about swimming pool temperature). The colder water made the divers worse at simple arithmetic and other mental tasks. But significantly, their performance was impaired as soon as they were put into the cold water — before their bodies had time to cool down. This suggests that the low temperature did not slow down mental functioning directly, but the feeling of cold distracted the divers from their tasks.

Psychologists have conducted studies showing that people become less skeptical and more optimistic when the weather is sunny. However, this apparently does not just depend on the temperature. A link between weather and mood is made believable by the evidence for a connection between behavior and the length of the daylight hours. This, in turn, might involve the level of a hormone called melatonin, produced in the pineal gland in the brain. The amount of melatonin falls with greater exposure to daylight. Research shows that melatonin plays an important part in the seasonal behavior of certain animals. For example, food consumption of stags increases during the winter, reaching a peak in February / March. It falls again to a low point in May, then rises to a peak in September, before dropping to another minimum in November. These changes seem to be triggered by varying melatonin levels.

It seems that time cues provided by the changing lengths of day and night trigger changes in animals' behavior — changes that are needed to cope with the cycle of the seasons. People's moods too, have been shown to react to the length of the daylight hours. Skeptics might say that longer exposure to sunshine puts people in a better mood because they associate it with the happy feelings of holidays and freedom from responsibility. However, the belief that rain and murky weather make people more unhappy is borne out by a study in Belgium, which showed that a telephone counselling service gets more telephone calls from people with suicidal feelings when it rains.

When there is a thunderstorm brewing, some people complain of the air being 'heavy' and of feeling irritable, moody and on edge. They may be reacting to the fact that the air can become slightly positively charged when large thunderclouds are generating the intense electrical fields that cause lightning flashes. The positive charge increases the levels of serotonin (a chemical involved in sending signals in the nervous system). High levels of serotonin in certain areas of the nervous system make people more active and reactive and, possibly, more aggressive. When certain winds are blowing, such as the Mistral in southern France and the Fohn in southern Germany, mood can be affected — and the number of traffic accidents rises. It may be significant that the concentration of positively charged particles is greater than normal in these winds. In the United Kingdom, 400,000 ionizers are

sold every year. These small machines raise the number of negative ions in the air in a room. Many people claim they feel better in negatively charged air.

22*. *Translate one paragraph from the following text in a written form paying attention to its grammar, lexical, and stylistic peculiarities. Discuss your translations in the group.*

Evaluation of Literature

One strategy for identifying the trends and patterns in the literature (suggested by Hubbuch, 1992, 133) is to make a table as follows: Author, Theory, Main Argument/Hypothesis, Key concepts/assumptions, Method, Results, Major point to make in my discussion (evaluation + connection).

Fill the boxes corresponding to each row (article/book), and then based on this table compose the literature review through a critical, thematic evaluation. Obviously, you need to fill brief and most pertinent notes in each box to keep the table manageable and make this strategy useful for you. The column headings can be as specific and detailed as you deem necessary. The table helps you summarize the literature, but is not included in the Literature Review section of the paper.

A critical, thematic evaluation:

A literature review is not a list in paragraph form, composed on the basis of the above table, where you "stack" the summary of each article/book you have read. Example: "A argued and found…" "B showed…" "C concluded…" Instead, relevant studies need to be critiqued and evaluated, with a view to building an argument. Thus, based on the above table (or your own approach) you need to identify themes in the literature. For example, a number of authors may be arguing the same point (when you glance at your table columnwise). Then, you would write summary sentences explaining this theme in the literature and attach citations to specific authors as illustrations of this pattern.

An example of a thematic evaluation is: "Many proponents of microcredit have argued that microcredit not only reduces household poverty but also increases the autonomy of women credit recipients (A, B, C). This claim has been the subject of intense debate, with many authors devising measures of empowerment to assess this argument. Some of these empirical studies have found support for the empowerment argument (C, D), while others have shown the empowerment effect to be contingent on other factors, such as asset ownership by women credit recipients (E). Yet others have pointed to the design of these programs as a major obstacle to increasing women's autonomy (F, G). The premise of the arguments by A, B and C is that… which assumes…". Notice that the thematic evaluation not only reflects your own thinking but also shifts the focus of the literature review from the work of others to the argument you are developing. You do not take at face value (report) what has been said by others but you evaluate it in light of the writings you've read in this topic, pointing out any flaw or weakness.

23*. *Write an invitation letter for a scientific conference. Write at least 500 words.*

SELF-STUDY ACTIVITIES

24. *Choose the correct option to complete the passage: Infinitive after certain verbs.* Δ = *no word is required.*

1. This is considered Δ / *to be / as being* too high. 2. This value was found *to be / as being* even higher. 3. We assumed *the values to be / that the values* were incorrect. 4. Smith suggested *researchers to / that researchers* should try a different method. 5. Pollution in the Antarctic is said Δ / *to be / as being* caused by several factors. 6. These results are thought Δ / *to be / as being* support the con firm Hejat's view. 7. The entities that are imagined Δ / *to be / as being* inside the mind are modelled on a particular class of entities that are outside the mind. 8. The subjects were known *have / as having had / to have had* a food allergy before the fatal event. 9. Aggression was hypothesized Δ / *to be / as being* a significant predictor of delinquency. 10. It was recommended that *there to be / should be* some standardization.

25. *Choose the correct option to complete the sentences: Infinitive after certain verbs* (*allow, enable, permit, suggest, recommend, want, would like, would prefer*).

A. 1. Their boss let them *go / to go* home early. 2. This will allow *to make / us to make* much progress. 3. This software enables calculations *to make / to be made* more quickly. 4. They were not permitted *leave / to leave* the country. 5. The new equipment allowed *to finish / them to finish* the job on time.

B. I hope all is well with you. Attached is our Abstract which I would like (1) *that you / you to read* and revise. It is actually 50 words over the limit required by the conference organizers, so I would recommend (2) *to you to / that you* remove any redundancy. The editor will expect (3) *us to / that we* provide the sources for all our materials, so we obviously need to add these. Also attached is our proposal for the request for funding. I suggest (4) *us to / that we* forward it to the Research Unit in Madrid. They will probably want (5) *that we / us to* phone them to discuss it. I would prefer (6) *that we / us to* use Skype if that is OK with you. I seem to remember that they suggested (7) *us to call / calling* early next week. If there is anything that you want (8) *me to / that I do*, feel free to let me know.

26. *Fill in the gaps with the appropriate words from the list.*

levied, integrity, undergo, unconvinced, albeit, panel, reluctance, notwithstanding, enormity, collegial

1. In Switzerland, when a male reaches 20 years of age, he is required to _____ 15 weeks of military training. 2. There is a nice _____ atmosphere among the teachers in the program here. 3. The territorial _____ of the country has been brought into doubt by claims made by its neighbour. 4. I told the kids that they would enjoy themselves at the museum, but they seemed _____. 5. The crew of the ship "the Bounty" lived among the Tahitian people for five months in 1788, and it was with great _____ that they set sail for Jamaica at the end of their stay on the island. 6. At more than 100 times the diameter of the earth, and more than 300,000 times its mass, the simple _____ of the sun is difficult to comprehend. 7. The war has _____ a heavy toll on the young men of our nation. 8. Albert Einstein once said that reality is merely an illusion, _____ a very persistent one. 9. The instrument _____ in the space shuttle has hundreds of buttons, meters, gauges and flashing lights on it. 10. _____ all the excellent points that have been raised today, I still disagree with the idea on principle.

27*. *Read a supervisor's letter and complete the gaps with the correct option.*

Dear Professor Ivanov,

I (1) *am writing / write* to see whether you (2) *can / might* be interested in hosting (3) *an / a* excellent PhD student of mine. My name is Gustav Muhler and I (4) *am / have been* a supervisor of PhD students in Science and Computing Engineering at HJB in Munich. (5) *This / That* graduate school awards PhD degrees to (6) *outstanding students / students outstanding.*

(7) *One of my / A my* PhD students, Carl Schmidt, has been working on XYZ (see a list of his publications below). I would very much like (8) *him to / that he* further this analysis by (9) *to work / working* for six months in your group. He has the following skills and knowledge areas that I think (10) *would be / are* of interest to you: (a) blah (b) blah (c) blah.

So, I (11) *am / was* wondering whether you (12) *could / might be* willing to host Carl for six months in your group. He (13) *would / will* of course be willing to fit in with any time schedule that (14) *would / will* suit you, but his preference (15) *would / will* be to start in September of this year. HJB (16) *would / could* pay for the period Carl will spend with you, so there (17) *would / could* be no expenses for you. I (18) *have put / put* Miroslav Gugerivic in cc just in (19) *case / the case* you need references about me and my group at the University of Munich.

It (20) *would / should* be great if you (21) *could / might* give Carl (21) *this / that* opportunity, and I am sure you (23) *would / could* find him a very useful addition to your team.

I look forward to (24) *hear / hearing* from you.

28. *Choose a scientific article in English concerning your own field of science from any valid information source (10 000 printed characters) and prepare its oral translation into Russian.*

29. ***Search the Internet and go to the libraries to find scientific and technical articles on the topics of Module 5. Analyze the gathered material, then prepare a 10-minute report on the chosen topic. Give a Power Point presentation in the group.***

MODULE TEST 5

Variant 1

1. ***Choose the correct infinitive, gerund or participle form.***

1. He was busy *sorting / being sorting / having sorted* samples in the laboratory. 2. In order to proceed with the registration, you need to fill in the form as *being instructed / having been instructed / instructed.* 3. The materials for the experiment have been chosen *to represent / represent / to have represented* a broad range of chemical properties. 4. Although all the data collected imply the existence of black holes, in order to be analyzed thoroughly they have *to observe / been observed / to be observed* directly. 5. In order to reach its objective, the project was estimated t*o be required / to be requiring / to have been requiring* investments worth several billion dollars. 6. She was proud *not to miss / to not have missed / not have missed* the opportunity which had made it possible for her to get a PhD degree in Biochemical Endocrinology. 7. It is obligatory *to provide / to be provided / to be providing* reference to all the sources used in your paper to avoid plagiarism. 8. It took Rachel less than a year t*o be developing / to develop / to have developed* an innovative technology and to apply for a patent. 9. The results of the experiment can't be considered reliable as there are some crucial factors that should *be taken / have taken / have been taken* into account during the test. 10. The range of issues debated by the committee should be specified in order to not waste / not to waste / not to be wasted time on less important questions.

2. Complete the sentences putting the verbs in brackets into the correct infinitive or -ing forms.

1. I need you _____ *(help)* me with my report. 2. Edward is accustomed to _____ *(work)* long hours. 3. _____ *(Film)* a wild animal in its habitat requires meticulous preparation and courage. 4. Sue's looking for the battery charger, but she couldn't _____ *(find)* it yet. 5. Swimmers should avoid _____ *(enter)* ocean areas contaminated by red tide organisms. 6. Because of financial restrictions, some schools cannot contemplate _____ *(stay)* abreast of advances in modern technology. 7. The graduates volunteered _____ *(work)* on the committee. 8. Would you mind _____ *(lend)* me your mobile for a moment? 9. Cristopher Columbus persuaded the Spanish monarchs Isabel and Fernando _____ *(finance)* his expeditions to the Caribbean. 10. Many traditional

attitudes and values seem _____ (*disappear)* under the pressure of global media now.

3. *Fill in the gaps with the appropriate words from the list:*

persistence, so-called, likewise, intrinsically, disassembly, whereby, oddly, depression, compilation, forthcoming

1. Oliver, usually the biggest talker, was _____ silent at yesterday's meeting. 2. Since 1951, 67,500 nuclear missiles have been built, of which 8,750 are currently active, and 1,250 are awaiting _____. 3. Scientists have found chocolate has a chemical that helps fight _____. 4. His wife is taking some silly course in this _____ institute where they claim to teach people to read minds. 5. Research into second language learning suggests that _____ is one of the most important learning strategies. 6. His latest album is a _____ of some of his personal favorite, though lesser-known songs. 7. My boss told me that additional funds for the project would be _____ within a few days. 8. The two countries have come to an agreement _____ they will share the revenues from oil discovered in the disputed territory. 9. I believe that people are _____ good, but may become bad due to a difficult childhood. 10. If you ever need any help, give me a call, and _____ , if I need some assistance, I'll let you know.

4. Read the text and answer the questions below it.

What do Scientists in Britain think about Alternative Therapies?

Is complementary medicine hocus-pocus or does it warrant large-scale scientific investigation? Should science range beyond conventional medicine and conduct research on alternative medicine and the supposed growing links between mind and body? This will be hotly debated at the British Association for the Advancement of Science.

One Briton in five uses complementary medicine, and according to the most recent Mintel survey, one in ten uses herbalism or homoeopathy. Around £130 million is spent on oils, potions and pills every year in Britain, and the complementary and alternative medicine industry is estimated to be worth £1.6 billion. With the help of Professor Edvard Ernst, Laing chair of complementary medicine at The Peninsula Medical School, Universities of Exeter and Plymouth, we asked scientists their views on complementary and alternative medicine. Seventy-five scientists, in fields ranging from molecular biology to neuroscience, replied.

Surprisingly, our sample of scientists was twice as likely as the public to use some form of complementary medicine, at around four in 10 compared with two in 10 of the general population. Three quarters of scientific users believed they were effective. Acupuncture, chiropractic and osteopathy were the most commonly used complementary treatments among scientists and more than 55 per cent

believed these were more effective than a placebo and should be available to all on the National Health Service.

Scientists appear to place more trust in the more established areas of complementary and alternative medicine, such as acupuncture, chiropractic and osteopathy, for which there are professional bodies and recognized training, than therapies such as aromatherapy and spiritual healing. "Osteopathy is now a registered profession requiring a certified four-year degree before you can advertise and practice," said one neuroscientist who used the therapy. Nearly two thirds of the scientists who replied to our survey believed that aromatherapy and homoeopathy were no better than placebos, with almost a half thinking the same of herbalism and spiritual thinking. Some of the comments we received were scathing, even though one in ten of our respondents had used homeopathy. "Aromatherapy and homoeopathy are scientifically nonsensical," said one molecular biologist from the University of Bristol. Dr Romke Bron, a molecular biologist at the Medical Research Council Centre at King's College London, added: "Homoeopathy is a big scam and I am convinced that if someone sneaked into a homoeopathic pharmacy and swapped labels, nobody would notice anything."

Two centuries after homeopathy was introduced, it still lacks a watertight demonstration that it works. Scientists are happy that the resulting solutions and sugar baffled by how they can do anything.

Both complementary and conventional medicine should be used in routine health care, according to followers of the "integrated health approach", who want to treat an individual "as a whole". But the scientists who responded to our surveys expressed serious concerns about this approach, with more than half believing that integrated medicine was an attempt to bypass rigorous scientific testing. Dr Bron said: "There is an awful lot of bad science going on in alternative medicine and the general public has a hard time to distinguish between scientific myth and fact. It is absolutely paramount to maintain rigorous quality control in health care. Although the majority of alternative health workers mean well, there are just too many frauds out there preying on vulnerable people."

One molecular biologist from the University of Warwick admitted that "by doing this poll I have realized how shamefully little I understand about alternative therapy. Not enough scientific research has been performed. There is enough anecdotal evidence to suggest that at least some of the alternative therapies are effective for some people, suggesting this is an area ripe for research."

When asked if complementary and alternative medicine should get more research funding, scientists believed the top three (acupuncture, chiropractic and osteopathy) should get money, as should herbalism. It seems that therapies based on physical manipulation or a known action — like the active ingredients in a herb on a receptor in the body — are the ones that the scientific community has faith in. Less than a quarter thought that therapies such as aromatherapy, homoeopathy and spiritual healing should get any funding.

Scientists believed that the "feel-good" counselling effect of complementary medicine and the

time taken to listen to patients' problems was what worked, rather than any medicinal effect. In contrast, the average visit to the doctor lasts only eight minutes, says the British Medical Association. Dr Stephen Nurrish, a molecular biologist at University College London, said: "Much of the benefit people get from complementary medicine is the time to talk to someone and be listened to sympathetically, something that is now lacking from medicine in general."

But an anonymous neuroscientist at King's College London had a more withering view of this benefit: "On the validity of complementary and alternative medicines, no one would dispute that "feeling good" is good for your health, but why discriminate between museum-trip therapy, patting-a-dog therapy and aromatherapy? Is it because only the latter has a cadre of professional "practitioners?"

There are other hardline scientists who argue that there should be no such thing as complementary and alternative medicine. As Professor David Moore, director of the Medical Research Council's Institute for Hearing Research, said: "Either a treatment works or it doesn't. The only way to determine if it works is to test it against appropriate controls (that is, scientifically)."

Questions

1. Who is sure that complementary medicine provides something that conventional medicine no longer does?
   a. Dr Romke Bron.
   b. a molecular biologist from the University of Warwick.
   c. Dr Stephen Nurrish.
   d. a neuroscientist at King's College London E Professor David Moore.
2. Who considers it to be hard for people to know whether they are being told the truth or not?
   a. Dr Romke Bron.
   b. a molecular biologist from the University of Warwick.
   c. Dr Stephen Nurrish.
   d. a neuroscientist at King's College London E Professor David Moore.
3. Certain kinds of complementary and alternative medicine are taken seriously because of the number of ...
   a. active ingredients.
   b. people making money from them.
   c. appropriate controls.
4. Nothing can be considered a form of medicine unless it has been proved to …
   a. have a rigorous quality control.
   b. has been advertised.
   c. have been proved effective.

5. What could he added to the group of therapies that deserved to be provided with resources for further investigation?

a. acupuncture.

b. aromatherapy.

c. herbalism.

d. homoeopathy.

Variant 2

1. *Choose the correct infinitive, gerund or participle form.*

1. *Conducting / Conducted / Being conducted* the experiment, he observed a certain pattern in all the samples. 2. Since its implementation, the strategy proposed by the environmental committee appears to *be showing / have shown / to have been showing* positive outcomes. 3. He considered the problem *solving / solved / having solved*. 4. He was relieved *not to expel / to not be expelled / not to have been expelled* for having missed the deadline to submit his term paper. 5. His research was a breakthrough and couldn't help but *to influence / influence / to have influenced* the whole scientific community. 6. The method of analysis proposed in his thesis was considered too *complicated / complicating / being complicated*. 7. *Graduating / Graduated / Having graduated* from MIT with honors, he decided to continue his work in the field of science and apply for a post-graduate course. 8. All essays must *submit / be submitted / be submitting* no later than the end of the week. 9. The application *submitting / not having submitted / not having been submitted* on time, Patrick lost his chance to win the grant. 10. Those who saw the shuttle *launch / to launch / to have launched* were impressed by the its size and greatness.

2. *Complete the sentences putting the verbs in brackets into the correct infinitive or -ing forms.*

1. We did these tests _____ (*prove)* our hypothesis. 2. (*Develop)* this program entailed carrying out various tests. 3. One approach is *(exploit)* the vast range of software already available. 4. We would like you *(participate)* in our congress. 5. They expect *(have)* their results ready by the end of the year. 6. It is difficult *(prove)* that $x = y$. 7. That $x = y$ is easy *(prove)*. 8. (*Prove)* that $x = y$ is straightforward. 9. We have amended the paper *(address)* most of the comments outlined in the referees` reports. 10. The manuscript has been revised *(follow)* the indications that you and the referees gave us.

3. *Fill in the gaps with the appropriate words from the list.*

conceivably, collapsed, adjacent, invoked, pose, encounter, straightforward, nonetheless, inclination, ongoing

1. All his life, he refused to believe in any religion, but on his deathbed, he suddenly _____ god, and asked for forgiveness. 2. Travelling to a different country allows you to _____ new ideas and new ways of living. 3. We didn't have very good tools, but I think we did a good job _____ . 4. The child had always shown artistic _____ so it came as no surprise when he decided to study visual arts in university. 5. Because of the melting of the polar ice caps, scientists say that trans-arctic voyages could _____ be possible within a few years. 6. On maps, _____ countries are usually shown in different colors. 7. Many citizens feel that a nuclear power plant could _____ serious environmental problems for the area. 8. On September 11th, 2001, the twin towers of the world trade center completely _____ shortly after they were struck by airliners hijacked by terrorists. 9. Harriet is very _____ in her approach to dealing with clients. 10. Fighting in the region has not stopped, despite _____ peace negotiations.

4. *Read the text and answer the questions below it.*

The Concept of Role Theory

Any individual in any situation occupies a role in relation to other people. The particular individual with whom one is concerned in the analysis of any situation is usually given the name of focal person. He has the focal role and can be regarded as sitting in the middle of a group of people, with whom he interacts in some way in that situation. This group of people is called his role set. The role set should include all those with whom the individual has more than trivial interactions.

Role definition

The definition of any individual's role in any situation will be a combination of the role expectations that the members of the role set have of the focal role. These expectations are often occupationally denned, sometimes even legally so. The role definitions of lawyers and doctors are fairly clearly defined both in legal and in cultural terms. The role definitions of, say, a film star or bank manager, are also fairly clearly defined in cultural terms, too clearly perhaps. Individuals often find it hard to escape from the role that cultural traditions have defined for them. Not only with doctors or lawyers is the required role behavior so constrained that if you are in that role for long it eventually becomes part of you, part of your personality. Hence, there is some likelihood that all accountants will be alike or that all blondes are similar — they are forced that way by the expectations of their role. It is often important that you make it clear what your particular role is at a given time. The means of doing this are called, rather obviously, role signs. The simplest of role signs is a uniform. The number of stripes on your arm or pips on your shoulder is a very precise role definition which allows you to do certain

very prescribed things in certain situations. Imagine yourself questioning a stranger on a dark street at midnight without wearing the role signs of a policeman! In social circumstances, dress has often been used as a role sign to indicate the nature and degree of formality of any gathering and occasionally the social status of people present. The current trend towards blurring these role signs in dress is probably democratic, but it also makes some people very insecure. Without role signs, who is to know who has what role?

Place is another role sign. Managers often behave very differently outside the office and in it, even to the same person. They use a change of location to indicate a change in role from, say, boss to friend. Indeed, if you wish to change your roles you must find some outward sign that you are doing so or you won't be permitted to change — the subordinate will continue to hear you as his boss no matter how hard you try to be his friend. In very significant cases of role change, e.g. from a soldier in the ranks to officer, from bachelor to married man, the change of role has to have a very obvious sign, hence rituals. It is interesting to observe, for instance, some decline in the emphasis given to marriage rituals. This could be taken as an indication that there is no longer such a big change in role from single to married person, and therefore no need for a public change in sign.

In organizations, office signs and furniture are often used as role signs. These and other perquisites of status are often frowned upon, but they may serve a purpose as a kind of uniform in a democratic society; roles without signs often lead to confused or differing expectations of the role of the focal person.

Role ambiguity

Role ambiguity results when there is some uncertainty in the minds, either of the focal person or of the members of his role set, as to precisely what his role is at any given time. One of the crucial expectations that shape the role definition is that of the individual, the focal person himself. If his occupation of the role is unclear, or if it differs from that of the others in the role set, there will be a degree of role ambiguity. Is this bad? Not necessarily, for the ability to shape one's own role is one of the freedoms that many people desire, but the ambiguity may lead to role stress which will be discussed later on. The virtue of job descriptions is that they lessen this role ambiguity.

Unfortunately, job descriptions are seldom complete role definitions, except at the lower end of the scale. At middle and higher management levels, they are often a list of formal jobs and duties that say little about the more subtle and informal expectations of the role. The result is, therefore, to give the individual an uncomfortable feeling that there are things left unsaid, i.e. to heighten the sense of role ambiguity.

Looking at role ambiguity from the other side, from the point of view of the members of the role set, lack of clarity in the role of the focal person can cause insecurity, lack of confidence, irritation and even anger among members of his role set. One list of the roles of a manager identified the

following: executive, planner, policy maker, expert, controller of rewards and punishments, counselor, friend, teacher. If it is not clear, through role signs of one sort or another, which role is currently the operational one, the other party may not react in the appropriate way — we may, in fact, hear quite another message if the focal person speaks to us, for example, as a teacher and we hear her as an executive.

Questions

1. What is the source of the text?
   a. A guide for new managers in a company.
   b. A textbook analysis of behavior in organizations.
   c. A critical study of the importance of role signs in modern society.
2. What is an individual's role in any situation?
   a. A uniform of some focal group.
   b. Some likelihood.
   c. A combination of the role expectations that the members of the role set have of the focal role.
3. In social circumstances, dress has not been used as …
   a. a role sign to indicate the degree of any gathering formality.
   b. the social status of people present.
   c. means to heighten the sense of role ambiguity.
4. What is the main reason for using a change of location?
   a. To indicate a change in role.
   b. To clarify the role of the focal person.
   c. To indicate roles with excessive signs.
5. Role ambiguity can be eliminated by ...
   a. job descriptions.
   b. the ability to shape one's own role.
   c. certain situations.

Module 6

SCIENCE: TURNING YOUR HOBBY INTO PROFESSION

Academic Word List: abandon, accompany, accumulate, ambiguous, append, appreciate, arbitrary, automate, bias, chart, clarify, commodity, complement, conform, contemporary, contradict, crucial, currency, denote, detect, deviate, displace, drama, eventual, exhibit, exploit, fluctuate, guideline, highlight, implicit, induce, inevitable, infrastructure, inspect, intense, manipulate, minimize, nuclear, offset, practitioner, predominant, prospect, radical, random, reinforce, restore, revise, schedule, tense, terminate, thereby, uniform, via, virtual, visual, widespread.

GRAMMAR REVISION

Inversion

1. ***Choose the correct option.***

1. Rarely *do you get / you have* the chance to see an active volcano from its rim. 2. They not only *took / did take* our passports but they also stole our shoes. 3. The children were taught how to catch fish and so *did / was* their grandmother. 4. So heavily *the rain fell / did the rain fall* that the water level in the river rose quickly. 5. Not only the visitors but also their guides *felt / did they feel* nervous in some parts of the jungle. 6. Little *they realized / did they realise* how dangerous the soldier ants were. 7. I didn't know much about Asian history and *so / neither* did my fellow travellers. 8. Never again *would he / he would* see such an amazing sunset. 9. Neither during this stay nor during the last one *did the hotel owner give / the hotel owner gave* me a discount. 10. Neither Anya nor Lora *offered / did they offer* to show me around.

Inversion of Subject and Object: Adverbs

2. ***Rewrite these sentences putting the word in italics as the first word in the sentence.***

> Example: *It was **only when** we saw the results that we understood the full meaning of our experiments.* = ***Only when** we saw the results **did** we understand the full meaning of our experiments.*

1. You can *only* proceed with the tests when all the samples have been cleaned. 2. We had *never* seen such a powerful reaction before. 3. People become overweight *not* by overeating but through lack of exercise. 4. This can be achieved *only* when $x = 1$. 5. Such data have *seldom* been reported in the literature. 6. I have *rarely* seen a paper of such high quality. 7. The paper *not only* fails to report some important references, but it also… 8. It is *only* when you see it that you realize how big it is.

Adverbs of Manner

3. ***Choose the correct position for the adverbs from the list in the following sentences.***

perfectly, fairly, exponentially, formally, differently, sincerely,
completely, simply, completely, carefully

1. This operational mode fits the typical scheme. 2. A broadband access network should share the bandwidth among all subscribers. 3. The durations of the ON and OFF periods are distributed. 4. We express this requirement in the following axiom. 5. These samples are stored differently from the others. 6. I am sorry to give you such short notice and I hope that this won't cause you too much trouble. 7. I understand what you mean. 8. I don't have the time. 9. I am not clear what the problem is. 10. I have read the manuscript and have made several changes.

4. Choose the correct position for the adverbs from the list in the following sentences.

honestly, jointly, correctly, ideally, obviously, individually,
correctly, accidentally, absolutely, basically

1. I don't know when I'll be able to find the time to do it. 2. I will be responsible for… 3. I'm sorry, but would you mind emailing that to me? I'm not sure if I've got it all. 4. I need the revised version by tomorrow night. 5. I don't expect you to read the entire document. 6. Rather than going through each report, we have organized our response under general areas. 7. So if I have understood, the problem is… 8. Sorry I hit the send button. 9. The referee is right in his / her comments. 10. So, I am asking you two things.

Adverbs: Normally, Consistently, Clearly, Finally

5. ***Choose the correct position for the adverbs from the list in the following sentences.***

normally, normally, consistently, consistently, clearly, finally, finally

1. The program is not behaving. 2. We do it on Monday but sometimes on Tuesday. 3. Treat your students with respect and consideration. 4. The reviews of the product have been brilliant. 5. The island is visible from the sky. 6. A billion dollars is not much for the USA. This is not so for African countries. 7. I`ve worked out how to do it. 8. *X* can be filled with *Y*.

Adverbs: All Types

6. ***Choose the correct position for the adverbs from the list in the following sentences.***

shortly, really, immediately, please, mainly, obviously, certainly, unfortunately, properly,
please, unfortunately, probably, also, only, already, also,

currently, actually, possibly, just

1. I will contact you again. 2. I would appreciate your input on this. 3. I'm sorry about that. I will look into it. 4. Should you have any questions let us know. 5. The discussion should be reviewed since it is based on results published in… 6. Sorry I didn't make myself clear. 7. The reviewer's suggestion is helpful. 8. ..., due to limited resources I am unable to accept your invitation to come to the meeting. 9. You sounded a little annoyed in your last mail. Maybe I had not expressed myself. 10. Accept our apologies for not getting back to you sooner. 11. I am writing to tell you that I no longer have the time to… 12. It is envisaged that the first applications will be limited to hospitals. 13. However, there are other types of antenna. 14. This function is required to process the first set of data. 15. This does not apply reservations have already been made. 16. This operation allows us to overcome some ambiguities. 17. I am working on a paper. 18. I don't think we have spoken before. 19. Could he call me back as soon as he returns as it's rather urgent? 20. I have got back from a conference.

READING AND SPEAKING

1. SCIENCE AS KNOWLEDGE AND PROFESSION. FAMOUS SCIENTISTS AND THEIR CAREER PATHS

7. ***Read the text and answer the questions below it.***

William Gilbert and Magnetism

The 16th and 17th centuries saw two great pioneers of modern science: Galileo and Gilbert. The impact of their findings is eminent. Gilbert was the first modern scientist, also the accredited father of the science of electricity and magnetism, an Englishman of learning and a physician at the court of Elizabeth. Prior to him, all that was known of electricity and magnetism was what the ancients knew, nothing more than that the lodestone possessed magnetic properties and that amber and jet, when rubbed, would attract bits of paper or other substances of small specific gravity. However, he is less well known than he deserves.

Gilbert's birth pre-dated Galileo. Born in an eminent local family in Colchester County in the UK, on May 24, 1544, he went to grammar school, and then studied medicine at St John's College, Cambridge, graduating in 1573. Later he travelled in the continent and eventually settled down in London.

He was a very successful and eminent doctor. All this culminated in his election to the president of the Royal Science Society. He was also appointed personal physician to the Queen (Elizabeth I), and later knighted by the Queen. He faithfully served her until her death. However, he didn't outlive

the Queen for long and died on November 30, 1603, only a few months after his appointment as personal physician to King James.

Gilbert was first interested in chemistry but later changed his focus due to the large portion of mysticism of alchemy involved (such as the transmutation of metal). He gradually developed his interest in physics after the great minds of the ancient, particularly about the knowledge the ancient Greeks had about lodestones, strange minerals with the power to attract iron. In the meantime, Britain became a major seafaring nation in 1588 when the Spanish Armada was defeated, opening the way to British settlement of America. British ships depended on the magnetic compass, yet no one understood why it worked. Did the Pole Star attract it, as Columbus once speculated; or was there a magnetic mountain at the pole, as described in Odyssey, which ships would never approach, because the sailors thought its pull would yank out all their iron nails and fittings? For nearly 20 years, William Gilbert conducted ingenious experiments to understand magnetism. His works include On the Magnet, Magnetic Bodies, and the Great Magnet of the Earth.

Gilbert's discovery was so important to modern physics. He investigated the nature of magnetism and electricity. He even coined the word "electric". Though the early beliefs of magnetism were also largely entangled with superstitions such as that rubbing garlic on lodestone can neutralise its magnetism, one example being that sailors even believed the smell of garlic would even interfere with the action of compass, which is why helmsmen were forbidden to eat it near a ship's compass. Gilbert also found that metals can be magnetised by rubbing materials such as fur, plastic or the like on them. He named the ends of a magnet "north pole" and "south pole". The magnetic poles can attract or repel, depending on polarity. In addition, however, ordinary iron is always attracted to a magnet. Though he started to study the relationship between magnetism and electricity, sadly he didn't complete it. His research of static electricity using amber and jet only demonstrated that objects with electrical charges can work like magnets attracting small pieces of paper and stuff. It is a French guy named du Fay that discovered that there are actually two electrical charges, positive and negative.

He also questioned the traditional astronomical beliefs. Though a Copernican, he didn't express in his quintessential beliefs whether the earth is at the centre of the universe or in orbit around the sun. However, he believed that stars are not equidistant from the earth but have their own earth-like planets orbiting around them. The earth itself is like a giant magnet, which is also why compasses always point north. They spin on an axis that is aligned with the earth's polarity. He even likened the polarity of the magnet to the polarity of the earth and built an entire magnetic philosophy on this analogy. In his explanation, magnetism is the soul of the earth. Thus, a perfectly spherical lodestone, when aligned with the earth's poles, would wobble all by itself in 24 hours. Further, he also believed that the sun and other stars wobble just like the earth does around a crystal core, and speculated that the moon might also be a magnet caused to orbit by its magnetic attraction to the earth. This was

perhaps the first proposal that a force might cause a heavenly orbit.

His research method was revolutionary in that he used experiments rather than pure logic and reasoning like the ancient Greek philosophers did. It was a new attitude towards the scientific investigation. Until then, scientific experiments were not in fashion. It was because of this scientific attitude, together with his contribution to our knowledge of magnetism, that a unit of magneto motive force, also known as magnetic potential, was named Gilbert in his honour. His approach of careful observation and experimentation rather than the authoritative opinion or deductive philosophy of others had laid the very foundation for modern science.

Questions

1. William Gilbert is the accredited father of the science of …
   a. transmutation of metal.
   b. electricity and magnetism.
   c. traditional astronomy.
2. Gilbert changed his focus due to the large portion of mysticism of alchemy involved. What particular change of focus is meant in the text?
   a. Prior to medicine, he studied alchemy.
   b. Prior to magnetism explanation, he questioned the traditional astronomical beliefs.
   c. He gradually developed his interest in physics after chemistry study.
3. Gilbert also found that metals can be magnetised by …
   a. interfering with the action of compass.
   b. the Earth`s crystal core.
   c. rubbing materials such as fur, plastic or the like on them.
4. The scientist believed that stars are not equidistant from the earth. What new astronomical believes are stated in Gilbert`s theory?
   a. The earth is at the centre of the universe.
   b. Stars are in orbit around the sun.
   c. The polarity of the magnet is not likened to the polarity of the Earth.
5. Which of the options is not a part of Gilbert`s discoveries?
   a. The Earth wobbles on its axis.
   b. Metals can be magnetized.
   c. Stars are at different distances from the Earth.
6. What was named Gilbert because of Gilbert`s scientific attitude, together with his contribution to knowledge of magnetism?
   a. A perfectly spherical lodestone.
   b. A unit of magneto motive force.

c. An electric potential.

7. What was new about Gilbert`s scientific research method?

a. His approach of careful observation.

b. The authoritative opinion or deductive philosophy of others.

c. He used scientific experiments rather than pure logic and reasoning

8. Is William Gilbert less famous than he should be? (open answer)

8. ***Draw the table containing word families for the words from this Module Academic Word List. Complete Table 6.1. Sometimes more than one form may be possible. If you are unsure about a form, check Appendix 4. The first two words are done for you.***

Table 6.1. Word Families for Module 6 Academic Word List

Verb	*Noun*	*Adjective*	*Adverb*	*Participle I, II*
abandon	abandon(s) abandonment	X	X	abandoning abandoned
accompany	company(-ies) accompanyist(s)	accompanying	X	accompanying accompanied

9. ***Fill in the gaps with the appropriate words from the list.***

minimize, abandoned, induces, predominantly, uniform, denotes, exhibited, arbitrary, revises, complement

1. A true scientist continually _____ his general theories as his knowledge increases. 2. If the experiments are set up properly, you can _____ the potential for bias in the results. 3. Boys' hair must be cut to _____ length at her son's private school. 4. The father _____ a total lack of understanding for the stress his child was feeling. 5. Teaching remains a _____ female profession in this country. 6. The number in brackets beside the course name _____ the number of credits the course is worth towards a degree. 7. We found a cat that had been _____ by its owners when they moved away. 8. Trying to read in a second language without sufficient knowledge of vocabulary simply _____ feelings of frustration. 9. Massage treatments can be used to _____ conventional medical therapies. 10. At one time, _____ arrest and detention without trial were common features of many military dictatorships throughout Latin America.

10. ***Group discussion on the topic "Science is More than a Social Institution. It is also a Profession". Discuss the following statements in the group. Express and prove your opinions; support them with the examples from your experience.***

1. Medicine, law and engineering suggest scientific research as an occupation. These professions share the following features: 1) a higher educational qualification as a prerequisite to entry into the occupation; 2) the privilege of monopoly of certain functions; 3) a measure of admission control into the occupation; 4) formal / informal authority of a professional body to control its members; 5) a limitation on the contractual obligations of the professional towards his client or employer.
2. Being transformed into profession, science has become a technique of mastering external environment and life.
3. Emerging technologies result in competitive advantages of current scientific research.

2. PRACTICAL USE OF SCIENTIFIC KNOWLEDGE

11. ***Read the text and answer the questions below it.***

Scientists Deploy "Nanotags" to Study Shorebirds.
Tiny Tracking Devices Help Identify Population Pressure Points

Scientists with the New Jersey Audubon are using some of the world's smallest tracking devices to solve one of the biggest conservation mysteries: What is driving the precipitous decline in shorebird populations, and where is that happening? By gluing tiny "nanotags" — button-sized radio transmitters trailing delicate wire antenna — to the backs of semipalmated sandpipers, researchers hope to identify exactly where the birds are running into trouble as they migrate back and forth between the Canadian arctic, the United States and northern South America.

"It's critical that we understand the threats to these species at each link of the chain," said David Mizrahi, vice president for research at New Jersey Audubon. "They face challenges everywhere along their migration route, but the weakest link is going to be the place putting the greatest pressure on those populations. These pressure points are driving the decline of the species overall."

The New Jersey Audubon project, supported by a grant from the National Fish and Wildlife Foundation, is designed to pinpoint these pressure points. Then conservation groups can direct resources and actions to address whatever issues are causing population declines.

World Travelers

Semipalmated sandpipers can fly more than 3,000 miles without stopping. No resting, no eating, no drinking — just six straight days of constant flight above a seemingly endless ocean. These small, brown-and-white shorebirds make such epic journeys twice a year, stopping along beaches and lakeshores across the United States. Many well-known sites serve as critical migration stepping stones, where the birds can recover and fuel up before the next leg of their journey.

But the sandpipers never stay for long. “The general perception is that these are North American species, but that’s not really the case,” Mizrahi said. “These birds are only here for four months out of every year. They’re really a South American bird that visits North America to breed.”

In the fall, sandpipers head south from summer breeding grounds in the arctic. Many of them fly directly from New England or eastern Canada to wintering grounds in the coastal marshes of French Guiana, Suriname and northeastern Brazil.

What happens to them when they finally reach this wintertime destination, with depleted fat reserves, after one of the natural world’s most grueling journeys? Scientists aren’t exactly sure. Over the past few decades, the populations of semipalmated sandpipers and other shorebirds have fallen dramatically. Recent studies suggest that several Atlantic Flyway shorebird species have experienced declines of between 50 and 90 percent within the past three decades.

Scientists theorize that loss of habitat, pollution and other factors in South American wintering grounds may be playing a major role.

“We know a lot about what happens to these birds when they come to North America, but very little about what happens when they go to Central and South America in the winter,” Mizrahi said. “Here in the United States, we tend to take for granted the availability of information and financial resources for conservation. We assume that’s happening in other places in the world, but in places like Suriname and Brazil, limited resources tend to be focused on protecting endemic species – like keeping parrots from being captured and sold on the black market. “We’re trying to make sure there are also continuing investments in migratory species, the birds that we share across the hemisphere.”

Tiny Tags, Big Impact

Scientists use many methods to track animal movement, including simple leg bands, radio and satellite telemetry, and geolocators. Radio telemetry is one of the oldest forms of wildlife tracking technology; in its early days biologists would attach collars with large radio transmitters to animals and then track their movements with hand-held antennas.

Technological advances have made it possible to shrink the size and cost of radio tracking devices. The current generation of nanotags, designed specifically to work on small birds that migrate long distances, can weigh less than a gram. Signals from nanotags are detected by receivers scattered along their migration routes; information on bird movements are uploaded to a central database located in southern Ontario. This international network, called Motus, alerts researchers when tagged birds pass within about 10 miles of a tower. Thousands of tags can be simultaneously deployed and tracked within the system, which currently includes more than 300 receiving stations throughout the Western Hemisphere.

Mizrahi and his colleagues plan to set up seven new tracking stations along the coasts of Suriname, French Guiana and northern Brazil. The team also plans to nanotag about 300 semipalmated

sandpipers captured near the stations.

The nanotags have a limited lifespan – about four months of battery power. But that's enough time for Mizrahi's team to track the sandpipers while they winter in northern South America.

"We are hoping to learn whether a bird tagged in November is still alive in March," Mizrahi said. "This is a key missing piece in our understanding about the relative importance of threats on the wintering grounds. Once we have these data, we can fill in the gaps in our population models."

Once researchers and conservation groups develop a more complete population model, they will be able to determine which factors affecting semipalmated sandpipers on their wintering grounds are driving the bird's decline. Then parallel efforts to address these factors by other partners who share the same goals could help alleviate this stress and boost the population of the transcontinental shorebirds.

Questions

1. What are scientists at trying to find out by applying nanotags?
   a. Challenges everywhere along the migration route of migratory birds.
   b. The most dangerous locations along migration route of birds.
   c. The actual degree of investments in migratory species.
2. What technological advances are not implemented for tracking migratory species?
   a. Radio and satellite telemetry.
   b. Geolocators.
   c. Collars with large radio transmitters.
   d. Nanotube technologies.
4. Vice president for research at New Jersey Audubon finds understanding the threats to these species at each link of the chain to be of vital importance. What evidence from the text supports this conclusion?
   a. Migratory species face challenges everywhere along their migration route.
   b. The pressure points along migration route are driving the decline of the species overall.
   c. Conservation groups can direct resources and actions on an even basis.
5. What can be concluded about the reason for the dramatical fall which several Atlantic Flyway shorebird species have experienced within the past three decades?
   a. The lack of information about birds` going to Central and South America on their wintering grounds.
   b. Pollution in South American wintering grounds may be play a major role.
   c. Loss of habitat in wintering grounds may play a major role.
   d. The lack of information about birds` going to North America.
6. Will you characterize one of the oldest forms of wildlife tracking technology? (open answer)

7. In which way did technological advancement change radio telemetry devices?

a. Dimension decreasing of radio tracking devices.

b. Cost increasing of radio tracking devices.

c. Advancing detecting system across the main migration routes.

8. The international network, called Motus, involves a central database, numerous receivers and tags that can be simultaneously deployed and tracked within the system. Nowadays it comprises …

a. about 300 tracking stations in the Western Hemisphere.

b. about 300 receiving stations along the coasts of Suriname, French Guiana and northern Brazil.

9. What is the main weak point of tiny tracking devices?

a. Nanotags yield weak signals.

b. Tiny tracking devices are too expensive.

c. Nanotags face threats on the wintering grounds.

d. Tiny tracking devices have a limited lifespan.

10. What cannot be concluded about the significance of a more complete bird population model?

a. Collaboration of scientists who understand the threats to these species at each link of the migration chain.

b. Finding out crucial aspects driving the semipalmated sandpipers's decline.

c. It gives a possibility of habitat extension.

d. It gives a possibility investments in migratory species.

12. ***Fill in the gaps with the appropriate words from the list.***

accumulates, contemporaries, via, radically, biased, tensions, infrastructure, deviant, offsets, fluctuations

1. The world of work was _____ altered by the Industrial Revolution. 2. Many organizations are purchasing carbon _____ to reduce their net climate impact. 3. You can expect minor _____ in your weight during the time you are doing heavy exercise. 4. The ancient Greek artist Polykleitos of Argos was greatly esteemed by his _____ for his sculptures of the human form. 5. Health experts warn that sun exposure _____ over time, damaging the skin and increasing the risk of cancers. 6. The mineral resources of Mali remain largely unexploited due to limitations caused by the country's poor _____. 7. In April of 1996, China, Russia and three former Soviet Republics signed a treaty aimed at reducing _____ along their borders. 8. This company is obviously _____ against women because there are absolutely no women whatsoever in senior management positions. 9. Some people fear that exposure to pornography on the Internet may promote _____ sexual behaviour,

including the abuse of children. 10. We heard the news that my aunt had died _____ my grandparents.

3. CONTEMPORARY SCIENTIFIC KNOWLEDGE AND CRITICAL THINKING

13. ***Read the text and find information about modern surveillance technologies.***

Art to the Aid of Technology

Our brains are incredibly agile machines, and it is hard to think of anything they do more efficiently than recognize faces. Just hours after birth, the eyes of newborns are drawn to facelike patterns. An adult brain knows it is seeing a face within 100 milliseconds, and it takes just over a second to realize that two different pictures of a face, even if they are lit or rotated in very different ways, belong to the same person.

Perhaps the most vivid illustration of our gift for recognition is the magic of caricature-the fact that the sparest cartoon of a familiar face, even a single line dashed off in two seconds, can be identified by our brains in an instant. It is often said that a good caricature looks more like a person than the person themselves. As it happens, this notion, counterintuitive though it may sound, is actually supported by research. In the field of vision science, there is even a term for this seeming paradox-the caricature effect-a phrase that hints at how our brains misperceive faces as much as perceive them.

Human faces are all built pretty much the same: two eyes above a nose that's above a mouth, the features varying from person to person generally by mere millimeters. So, what our brains look for, according to vision scientists, are the outlying features-those characteristics that deviate most from the ideal face we carry around in our heads, the running average of every 'visage' we have ever seen. We code each new face we encounter not in absolute terms but in the several ways, it differs markedly from the mean. In other words, we accentuate what is most important for recognition and largely ignore what is not. Our perception fixates on the upturned nose, the sunken eyes or the fleshy cheeks, making them loom larger. To better identify and remember people, we turn them into caricatures.

Ten years ago, we all imagined that as soon as surveillance cameras had been equipped with the appropriate software, the face of a crime suspect would stand out in a crowd. Like a thumbprint, its unique features and configuration would offer a biometric key that could be immediately checked against any database of suspects. But now a decade has passed, and face-recognition systems still perform miserably in real-world conditions. Just recently, a couple who accidentally swapped passports at an airport in England sailed through electronic gates that were supposed to match their faces

to file photos.

All this leads to an interesting question. What if, to secure our airports and national landmarks, we need to learn more about caricature? After all, it's the skill of the caricaturist-the uncanny ability to quickly distill faces down to their most salient features-that our computers most desperately need to acquire. Clearly, better cameras and faster computers simply aren't going to be enough.

At the University of Central Lancashire in England, Charlie Frowd, a senior lecturer in psychology, has used insights from caricature to develop a better police-composite generator. His system, called EvoFIT, produces animated caricatures, with each successive frame showing facial features that are more exaggerated than the last. Frowd's research supports the idea that we all store memories as caricatures, but with our own personal degree of amplification. So, as an animated composite depicts faces at varying stages of caricature, viewers respond to the stage that is most recognizable to them. In tests, Frowd's technique has increased positive identifications from as low as 3 percent to upwards of 30 percent.

To achieve similar results in computer face recognition, scientists would need to model the artist's genius even more closely-a feat that might seem impossible if you listen to some of the artists describe their nearly mystical acquisition of skills. Jason Seiler recounts how he trained his mind for years, beginning in middle school, until he gained what he regards as nothing less than a second sight. "A lot of people think that caricature is about picking out someone's worst feature and exaggerating it as far as you can," Seiler says. "That's wrong. Caricature is basically finding the truth. And then you push the truth." Capturing a likeness, it seems, has less to do with the depiction of individual features than with their placement in relationship to one another. "It's how the human brain recognizes a face. When the ratios between the features are correct, you see that face instantly."

Pawan Sinha. director of MIT's Sinha Laboratory for Vision Research, and one of the nation's most innovative computer-vision researchers, contends that these simple, exaggerated drawings can be objectively and systematically studied and that such work will lead to breakthroughs in our understanding of both human and machine-based vision. His lab at MIT is preparing to computationally analyze hundreds of caricatures this year, from dozens of different artists, with the hope of tapping their intuitive knowledge of what is and isn't crucial for recognition. He has named this endeavor the Hirschfeld Project, after the famous New York Times caricaturist Al Hirschfeld.

Quite simply, by analyzing sketches, Sinha hopes to pinpoint the recurring exaggerations in the caricatures that most strongly correlate to particular ways that the original faces deviate from the norm. The results, he believes, will ultimately produce a rank-ordered list of the 20 or so facial attributes that are most important for recognition: 'It's a recipe for how to encode the face,' he says. In preliminary tests, the lab has already isolated important areas-for example, the ratio of the height of the forehead to the distance between the top of the nose and the mouth.

On a given face, four of 20 such Hirschfeld attributes, as Sinha plans to call them, will be several standard deviations greater than the mean; on another face, a different handful of attributes might exceed the norm. But in all cases, it's the exaggerated areas of the face that hold the key. As matters stand today, an automated system must compare its target faces against the millions of continually altering faces it encounters. But so far, the software doesn't know what to look for amid this onslaught of variables. Armed with the Hirschfeld attributes, Sinha hopes that computers can be trained to focus on the features most salient for recognition, tuning out the others. 'Then.' Sinha says, 'the sky is the limit'.

14. ***Which paragraph of the text from exercise 13 contains the following information? You may use any statement more than once.***

1. Why we have mental images of faces that are essentially caricatures.
2. Mentioning of the length of time it can take to become a good caricaturist an example of how unreliable current security systems can be.
3. Reference to the fact that we can match even a hastily drawn caricature to the person it represents.
4. A summary of how the use of multiple caricatures has improved recognition rates in a particular field.
5. A comparison between facial recognition and another well-established form of identification.

15. ***Match each statement with the correct person.***

List of People:

A – Charlie Frowd; B – Jason Seiler; C – Pawan Sinha.

1. A single caricature can be recognized straight away if the parts of the face are appropriately positioned.
2. An evaluation of the work of different caricaturists will provide new information about how we see faces.
3. People misunderstand what is involved in the design of a caricature.
4. When given a choice, people will have different views regarding which caricature best represents a particular person's face.

16. ***Complete the summary below. Choose no more than two words from the passage for each answer.***

Sinha's aim in the project is to come up with a specific number of what he terms (1) _____ that are key to identification purposes. He hopes these can be used to enable an (2) _____ to identify faces

more quickly and more accurately. In order to do this, his team must examine the most frequently (3) _____ features in a large number of cartoon faces.

17*. *Read the text and render it in English.*

A Neuroscientist Reveals How to Think Differently

In the last decade, a revolution has occurred in the way that scientists think about the brain. We now know that the decisions humans make can be traced to the firing patterns of neurones in specific parts of the brain. These discoveries have led to the field known as neuroeconomics, which studies the brain's secrets to success in an economic environment that demands innovation and being able to do things differently from competitors. A brain that can do this is an iconoclastic one. Briefly, an iconociost is a person who does something that others say can't be done.

This definition implies that iconoclasts are different from other people, but more precisely, it is their brains that are different in three distinct ways: perception, fear response, and social intelligence. Each of these three functions utilizes a different circuit in the brain. Naysayers might suggest that the brain is irrelevant, that thinking in an original, even revolutionary way is more a matter of personality than brain function. But the held of neuroeconomics was born out of the realization that the physical workings of the brain place limitations on the way we make decisions. By understanding these constraints, we begin to understand why some people march to a different drumbeat.

The first thing to realize is that the brain suffers from limited resources. It has a fixed energy budget, about the same as a 40watt light bulb, so it has evolved to work as efficiently as possible. This is where most people are impeded from being an iconoclast. For example, when confronted with information streaming from the eyes, the brain will interpret this information in the quickest way possible. Thus, it will draw on both past experience and any other source of information, such as what other people say, to make sense of what it is seeing. This happens all the time. The brain takes shortcuts that work so well we are hardly ever aware of them. We think our perceptions of the world are real, but they are only biological and electrical rumblings. Perception is not simply a product of what your eyes or ears transmit to your brain. More than the physical reality of photons or sound waves, perception is a product of the brain.

Perception is central to iconoclasm. Iconoclasts see things differently to other people. Their brains do not fall into efficiency pitfalls as much as the average person’s brain. iconoclasts, either because they were born that way or through learning, have found ways to work around the perceptual shortcuts that plague most people. Perception is not something that is hardwired into the brain. It is a learned process, which is both a curse and an opportunity for change. The brain faces the fundamental problem of interpreting physical stimuli from the senses.

Everything the brain sees, hears, or touches has multiple interpretations. The one that is ultimately

chosen is simply the brain's best theory. In technical terms, these conjectures have their basis in the statistical likelihood of one interpretation over another and are heavily influenced by past experience and, importantly for potential iconoclasts what other people say.

The best way to see things differently to other people is to bombard the brain with things it has never encountered before. Novelty releases the perceptual process from the chains of past experience and forces the brain to make new judgments. Successful iconoclasts have an extraordinary willingness to be exposed to what is fresh and different. Observation of iconoclasts shows that they embrace novelty while most people avoid things that are different.

The problem with novelty, however, is that it tends to trigger the brain's fear system. Fear is a major impediment to thinking like an iconoclast and stops the average person in his tracks. There are many types of fear, but the two that inhibit iconoclastic thinking and people generally find difficult to deal with are fear of uncertainty and fear of public ridicule. These may seem like trivial phobias. But fear of public speaking, which everyone must do from time to time, afflicts one-third of the population. This makes it too common to be considered a mental disorder. It is simply a common variant of human nature, one which iconoclasts do not let inhibit their reactions

Finally, to be successful iconoclasts, individuals must sell their ideas to other people. This is where social intelligence comes in. Social intelligence is the ability to understand and manage people in a business setting. ln the last decade, there has been an explosion of knowledge about the social brain and how the brain works when groups coordinate decision making. Neuroscience has revealed which brain circuits are responsible for functions like understanding what other people think, empathy, fairness, and social identity. These brain regions play key roles in whether people convince others of their ideas. Perception is important in social cognition too. The perception of someone's enthusiasm, or reputation, can make or break a deal. Understanding how perception becomes intertwined with social decision making shows why successful iconoclasts are so rare.

Iconoclasts create new opportunities in every area from artistic expression to technology to business They supply creativity and innovation not easily accomplished by committees. Rules aren't important to them. Iconoclasts face alienation and failure, but can also be a major asset to any organization. It is crucial for success in any field to understand how the iconoclastic mind works.

18. ***Answer the questions to the text from Exercise 17.***

1. Neuroeconomics is a field of study which seeks to …

   a. cause a change in how scientists understand brain chemistry.

   b. understand how good decisions are made in the brain.

   c. understand how the brain is linked to achievement in competitive fields.

   d. trace the specific firing patterns of neurones in different areas of the brain.

2. According to the writer, iconoclasts are distinctive because …

a. they create unusual brain circuits.

b. their brains function differently.

c. their personalities are distinctive.

d. they make decisions easily.

3. According to the writer, the brain works efficiently because …

a. it uses the eyes quickly.

b. it interprets data logically.

c. it generates its own energy.

d. it relies on previous events.

4. The writer says that perception is…

a. a combination of photons and sound waves.

b. a reliable product of what your senses transmit.

c. a result of brain processes.

d. a process we are usually conscious of.

5. According to the writer an iconoclastic thinker …

a. centralizes perceptual thinking in one part of the brain.

b. avoids cognitive traps.

c. has a brain that is hardwired for learning.

d. has more opportunities than the average person.

6. Thinking like a successful iconoclast is demanding because it ...

1. 1. requires both perceptual and social intelligence skills.
2. 2. requires both perceptual and social intelligence skills.
3. 3. leaves one open to criticism and rejection.
4. 4. involves understanding how organizations manage people.

7. What does the underlined phrase 'broke new ground’ in line 44 mean?

a. a. built on the work of others.

b. b. produced unusual or unexpected results.

c. c. proved earlier theories on the subject to be false.

d. d. achieved something that had not been done before.

8. What was most significant about Leuthardt and Schalk’s work?

a. a. They succeeded in grouping certain phonemes into words.

b. b. They linked the production of phonemes to recognizable brain activity.

c. c. Their methods worked for speakers of languages other than English.

d. d. Their subjects were awake during the course of their experiments.

9. What does the writer conclude about mind reading?

1. 1. It could become a form of entertainment.
2. 2. It may contribute to studies on language acquisition.
3. 3. Most people are keenly awaiting the possibility of doing it.
4. 4. Mobile technologies may become unreliable because of it.

10. What is the main purpose of the writer of this passage?

a. a. to give an account of the developments in mind-reading research.
b. b. to show how scientists' attitudes towards mind reading have changed.
c. c. to explain why mind-reading research should be given more funding.
d. d. to fully explore the arguments for and against mind reading.

4. OUTASTANDING SCIENTISTS, THEIR SCIENTIFIC PATH. DEFENDING MASTER'S THESIS

19. ***Read the text and explain the nature of genius.***

The Nature of Genius

There has always been an interest in geniuses and prodigies. The word 'genius', from the Latin gens (= family) and the term 'genius', meaning 'begetter', comes from the early Roman cult of a divinity as the head of the family. In its earliest form, genius was concerned with the ability of the head of the family, the paterfamilias, to perpetuate himself. Gradually, genius came to represent a person's characteristics and thence an individual's highest attributes derived from his 'genius' or guiding spirit. Today, people still look to stars or genes, astrology or genetics, in the hope of finding the source of exceptional abilities or personal characteristics.

The concept of genius and of gifts has become part of our folk culture, and attitudes are ambivalent towards them. We envy the gifted and mistrust them. In the mythology of giftedness, it is popularly believed that if people are talented in one area, they must be defective in another, that intellectuals are impractical, that prodigies burn too brightly too soon and burn out, that gifted people are eccentric, that they are physical weaklings, that there's a thin line between genius and madness, that genius runs in families, that the gifted are so clever they don't need special help, that giftedness is the same as having a high IQ, that some races are more intelligent or musical or mathematical than others, that genius goes unrecognized and unrewarded, that adversity makes men wise or that people with gifts have a responsibility to use them. Language has been enriched with such terms as 'highbrow', 'egghead', 'blue-stocking', 'wiseacre', 'know-all', 'boffin' and, for many, 'intellectual' is a term of

denigration.

The nineteenth century saw considerable interest in the nature of genius, and produced not a few studies of famous prodigies. Perhaps for us today, two of the most significant aspects of most of these studies of genius are the frequency with which early encouragement and teaching by parents and tutors had beneficial effects on the intellectual, artistic or musical development of the children but caused great difficulties of adjustment later in their lives, and the frequency with which abilities went unrecognized by teachers and schools. However, the difficulty with the evidence produced by these studies, fascinating as they are in collecting together anecdotes and apparent similarities and exceptions, is that they are not what we would today call norm-referenced. In other words, when, for instance, information is collated about early illnesses, methods of upbringing, schooling, etc., we must also take into account information from other historical sources about how common or exceptional these were at the time. For instance, infant mortality was high and life expectancy much shorter than today, home tutoring was common in the families of the nobility and wealthy, bullying and corporal punishment were common at the best independent schools and, for the most part, the cases studied were members of the privileged classes. It was only with the growth of pediatrics and psychology in the twentieth century that studies could be carried out on a more objective, if still not always very scientific, basis.

Geniuses, however, they are defined, are but the peaks which stand out through the mist of history and are visible to the particular observer from his or her particular vantage point. Change the observers and the vantage points, clear away some of the mist, and a different lot of peaks appear. Genius is a term we apply to those whom we recognise for their outstanding achievements and who stand near the end of the continuum of human abilities which reaches back through the mundane and mediocre to the incapable. There is still much truth in Dr Samuel Johnson's observation, The true genius is a mind of large general powers, accidentally determined to some particular direction'. We may disagree with the 'general', for we doubt if all musicians of genius could have become scientists of genius or vice versa, but there is no doubting the accidental determination which nurtured or triggered their gifts into those channels into which they have poured their powers so successfully. Along the continuum of abilities are hundreds of thousands of gifted men and women, boys and girls.

What we appreciate, enjoy or marvel at in the works of genius or the achievements of prodigies are the manifestations of skills or abilities which are similar to, but so much superior to, our own. But that their minds are not different from our own is demonstrated by the fact that the hard-won discoveries of scientists like Kepler or Einstein become the commonplace knowledge of schoolchildren and the once outrageous shapes and colors of an artist like Paul Klee so soon appear on the fabrics we wear. This does not minimize the supremacy of their achievements, which outstrip our own as the sub-four-minute milers outstrip our jogging.

To think of geniuses and the gifted as having uniquely different brains is only reasonable if we accept that each human brain is uniquely different. The purpose of instruction is to make us even more different from one another, and in the process of being educated, we can learn from the achievements of those mom gifted than ourselves. But before we try to emulate geniuses or encourage our children to do so we should note that some of the things we learn from them may prove unpalatable. We may envy their achievements and fame, but we should also recognize the price they may have paid in terms of perseverance, single-mindedness, dedication, restrictions on their personal lives, the demands upon their energies and time, and how often they had to display great courage to preserve their integrity or to make their way to the top.

Genius and giftedness are relative descriptive terms of no real substance. We may, at best, give them some precision by defining them and placing them in a context but, whatever we do, we should never delude ourselves into believing that gifted children or geniuses are different from the rest of humanity, save in the degree to which they have developed the performance of their abilities.

20. ***Do the following statements agree with the claims of the text from ex. 19? There are three possible options (*****YES, NO, NOT GIVEN*****). Choose one option. Discuss your opinions with your groupmates.***

1. Nineteenth-century studies of the nature of genius failed to take into account the uniqueness of the person's upbringing.
2. Nineteenth-century studies of genius lacked both objectivity and a proper scientific approach.
3. A true genius has general powers capable of excellence in any area.
4. The skills of ordinary individuals are in essence the same as the skills of prodigies.
5. The ease with which truly great ideas are accepted and taken for granted fails to lessen their significance.
6. Genius can be easily destroyed by discouragement.
7. Giftedness and genius deserve proper scientific research into their true nature so that all talent may be retained for the human race.
8. Geniuses often pay a high price to achieve greatness.
9. To be a genius is worth the high personal cost.
10. Genius will always reveal itself.

21. ***Group discussion on the topic "Some Researchers Became Advocates of Peace. What Led Them to Their Fateful Decision?". Discuss the points in the group. Express and prove your opinions; support them with the examples from your experience.***

22. ***Fill in the gaps with the appropriate words from the list.***

virtually, contradict, guidelines, ambiguity, charting, displaced, paragraphing, inspection, random, terminated

1. Captain James Cook refined his navigational skills while _____ the coasts of Newfoundland and Labrador from 1763 to 1767. 2. Over 2000 years ago, Socrates complained, "Children today are tyrants. They _____ their parents, gobble their food, and tyrannize their teachers." 3. It is _____ impossible to get tickets for the concert now; they were all sold out within hours. 4. There is always a certain degree of _____ in language, which can be difficult for language learners to accept. 5. Clearer _____ on defining what is to be considered organic food will help consumers make informed choices. 6. Her angry remark _____ the discussion. 7. An essential aspect of _____ samples is that the population must be explicitly defined or identified. 8. As male buffalo get older and are _____ by new dominant males, they leave the herd and live on their own. 9. A firefighter came to our office to do an _____ for fire safety. 10. This writing course will focus on spelling, punctuation, and _____.

23*. ***Read the text and render it in English.***

Presenting your Thesis

To make the most out of one's limited amount of time, one should select to present only the most-important elements of the thesis. Obviously, one cannot cover the contents of an entire paper in a short period of time, especially for an audience that may not be expert in the area. One needs to realize that the proof details of one's favorite theorem cannot be appreciated in a ten-minute talk. Complex theorems often require an extensive mathematical background, so merely presenting the preliminaries may take fifteen minutes. If a particular theorem is the most-important result in the work, then it may be worth the extra time. If the theorem is not critical, then simply motivate the theorem, state it, and move on to other considerations. One can state that the thesis contains more details, and interested audience members can read the proof of the theorem on their own.

One needs to be realistic about the time slotted for the presentation. Conference-paper talks are usually between ten and forty minutes, with twenty minutes being the norm. Deep results that require extensive proof can be discussed, but only briefly. In mathematical talks of twenty minutes or less, proofs are almost always excluded, unless they are extremely short and easy-to-grasp.

It is usually preferable to explain why a result is important rather than to go through its proof in a rushed fashion.

Typically, one will begin a talk by providing background for the research. This introduction may include a discussion of the problem's origin. For example, does the work solve a long-standing open

problem? How does the work relate to previous research? One must to be sure to credit and cite other people's work if one's results are an expansion of theirs. It is important to discuss the motivation behind one's work before one jumping into specific results. Why are the results interesting and important? As one introduces a topic, one should show illustrative examples so that the audience can quickly grasp definitions. One should avoid long technical definitions, if possible, and to the extent that is possible, one should try to use jargon and notation that is familiar to the audience.

After the including the required preliminary information, one should discuss the results that are described in the thesis. One can briefly state the results without going into elaborate explanations. If there is still time left, one can go into the details of one of the more-important results. One should not choose the most-difficult result or rush through an explanation. Placing an explanation directly after a result should help with the flow of the talk. One must check during rehearsal that one has enough time to complete the talk. One should always try to develop the context for one's work, and when appropriate, one should include a section on related research. It is a good idea to finish a talk by giving some unsolved problems. Researchers are always looking for new problems to study. Posing interesting open questions is an important and an expected contribution of a talk. One should explain the questions and their significance. Usually, it is appropriate to include three-to-five problems.

In advance, a speaker should find out whether questions will be allowed during a session or only afterward. If one is running late, the speaker can decide to ask the audience to hold their questions until the end. One may also need to defer a question for later discussion. Methods for handling questions are discussed in the section titled "Trouble Spots" that occurs later in this chapter.

One may decide to bring hand-out copies to distribute during the talk. The hardcopies become quite useful when one cannot remember all of the details.

As of late, it would be more customary to simply provide an online reference for the paper, from where interested audience members could download the paper.

One must remember to be very selective in what one presents. The success of a defense depends heavily on the content that one decides to deliver. Too-little content will result in a weak and short presentation, whereas too-much content may frustrate the audience if one does not cover the material effectively.

The Master's Thesis should have the standard sections of a research paper, each of which addresses basic questions:

1. Introduction.

What is the project about?

Why is this an important research question?

How will you analyze this issue?

2. Literature Review.

What do we already know about this issue? (What have others said and provided evidence for?)

3. Methodology.

How will you examine this issue?

4. Discussion of Results.

What are the main findings of the project?

In what ways do these modify/add to the existing literature?

5. Conclusions.

24*. *Group discussion on the topic «Requirements for Thesis Structure and Defence in the Russian Federation and Abroad». Discuss the statements of the text "Presenting your Thesis" in the group. Express and prove your opinions; support them with the examples from your experience.*

WRITING

25*. *Write an academic report on the topic "Nanotechnology is the heart of things that we surround ourselves with every day".*

26. *Translate one paragraph from the text "A Neuroscientist reveals how to think differently" in the written form paying attention to its grammar, lexical, and stylistic peculiarities.*

SELF-STUDY ACTIVITIES

27. *Choose the correct option: adjectives and comparative forms.*

1. There are several *available positions / positions available* for good candidates. 2. This is a *fascinating paper / paper fascinating* for those in this field. 3. They have a *big black / black big* dog. 4. We have recruited a *25-year old student / student 25 years old* to work in our lab. 5. She is a *professor very easy / very easy professor* to work with. 6. France and Italy have *patterns more evident / more evident patterns* than Germany and the UK. 7. We need a *capacity greater / greater capacity* than is currently available. 8. We need a *capacity to process data that is greater / greater capacity to process data* than is currently available. 9. This represents a *higher threshold / threshold higher* than was expected. 10. The *range is wider, greater is the number of values / greater the number of values, the wider the range*.

28. ***Choose the correct option for the adverb in italics: also, either, both.***

1. However, *also X*s and *Y*s *also* exist. 2. However, *X* is *only* required to *only* process *Y*. 3. This operation *also* allows us *also* to do *X*. 4. *Also* I have *also* been there. 5. This *also* depends *also* on how much time you have. 6. At a conference, the *only* two interesting lectures will *only* be held at the same time. 7. If the *only* tool you have is *only* a hammer, you treat everything in life like a nail. 8. You can *only* find them in one place *only*. 9. You *only* have *only* to sign it. 10. This will lead to *both* an improvement of *both x* and *y*. 11. A small shift was noticed *both* for *both* the samples considered. 12. This should be true *both* in *both* absolute and relative terms. 13. This will not lead to an improvement *either* in *either x* or *y*. 14. *Either* they want *either* it or they don't. 15. It will be *either* done *either* today or tomorrow. 16. This will not *either* improve the other methods *either*.

29. ***Fill in the gaps with the appropriate words from the list.***

reinforces, highlights, visual, dramatic, plus, intensification, crucial, theme, clarity, appendages

1. An improvement in the economic future of the lower class is _____ if the country wants to avoid a civil war. 2. Certain kinds of starfish have as many as fifty _____. 3. The discovery of oil in the 1950s had a _____ effect on the Libyan economy and society. 4. A popular _____ in Karen's artwork has always been the relationship between mothers and daughters. 5. This job requires the proper education, _____ at least three years' experience. 6. I don't quite understand what you mean. Can you _____ that last point for me? 7. With the growth of a city, _____ occurs naturally as more people and functions crowd together and mutually support one another. 8. The colour combination with the strongest _____ impact is black on yellow. 9. We missed seeing the final of the World Cup, but caught the _____ on the news. 10. Emile Durkheim suggested that religion creates and _____ social solidarity.

30*. ***Choose the correct option.***

1. You *hardly ever see / don't see often* a tiger in the wild. 2. No matter how brave *you are / are you*, coming face to face with a grizzly bear is a frightening experience. 3. Cobras *don't usually / usually don't* act aggressively unless they are threatened. 4. He might *not have / have not* survived if he'd been alone. 5. The donkey wouldn't move, *however / no matter* hard we tried to get it to take a step. 6. How *he succeeded / did he succeed* in riding the bull is beyond me. 7. Don't be surprised if the dog growls at you because it *always does / does always* when a stranger walks in. 8. They *always are / are always* willing to take in a stray dog or cat. 9. *That* / *What* I saw was not a bear. It was something much bigger! 10. *There* / *It* was a mountain lion that attacked him, not a coyote.

31. ***Choose a scientific article in English concerning your own field of science from any valid information source (10 000 printed characters) and prepare its oral translation into Russian.***

32. ***Search the Internet and go to the libraries to find scientific and technical articles on the topics of Module 6. Analyze the gathered material, then prepare a 10-minute report on the chosen topic. Give a Power Point presentation in the group.***

MODULE TEST 6

Variant 1

1. ***Choose the correct verb form.***

1. I *would / would like to* submit for publication in the Journal of Future Education the attached paper entitled "A Proposal for Radical Educational Reform" by Adrian Wallwork and Anna Southern. 2. Our aim was *to test / testing* the efficiency of short- and long-duration degree courses. 3. Our study of 15,000 male and female graduates aged between 35 and 55 found that they would have performed far better in their careers from a financial point of view if they *undertook / had undertaken* a one-year course at university rather than the traditional three to four-year course. 4. Our key finding is that people on shorter courses *will / would* earn up to 15% more during their lifetime. 5. The implications of this *are / will be* not only for the graduates themselves. 6. In fact, governments *can* / *could* save considerable amounts of money, and universities would be free to accept more students. 7. We believe that our findings *will* / *should* be of great interest to readers of your journal. 8. The findings go against the general trend that claims that university courses *would* / *should* be increased in length. 9. This research *has not been* / *was not* published before and is not being considered for publication elsewhere. 10. I *look* / *am looking* forward to hearing from you.

2. ***Choose the correct form.***

1. *The our / Our* methodology is composed of A, B and C. 2. We believe that our research will add to the current debate on ecological and sustainable design *that / which* other papers in your journal have initiated (e.g. Singh, Mansour). 3. In fact, we suppose that our research would provide *a / an* unique contribution to this important subject. 4. *The / - (zero article)* findings of our study are: … 5. The *identification / Identifying* of … . 6. We believe that these findings have the *followed / following* implications: … 7. They provide *any / some* new information for researchers. 8. They should *help /*

to help stimulate the development of … . 9. The manuscript has not been submitted to *any / some* other journals. 10. *The English / English* has been revised by a native speaker.

3. *Fill in the gaps with the appropriate words from the list.*

practitioner, eventually, thereby, currencies, widespread, restore, appreciating, manipulate, commodities, implicit

1. Scientists working in the battle against cancer are hoping to be able to _____ the DNA of a cancer sufferer so that the disease kills itself. 2. A proper diet and plenty of rest have helped to _____ her to good health. 3. British Columbia's main _____ are forest products and fish. 4. There has been a _____ migration of people to the urban centers of Iraq over the past 50 years. 5. The stars in our sky form from gas in the universe and _____ they grow old and die. 6. Medical _____ reports which are stored on computers are vulnerable to hackers who may want to steal private information. 7. The huge fast-food chains generally pay their workers low wages, _____ helping to depress wages for workers in the entire trade. 8. With the economy failing, the shopkeepers would only accept payment in foreign _____. 9. Young children have an unquestioning and _____ faith in their parents' decisions. 10. The values of homes in this neighborhood have been _____ steadily for about the past 5 years.

4. *Read the text and answer the questions below it.*

Video Game Research

Although video games were first developed for adults, they are no longer exclusively reserved for the grown-ups in the home. In 2006, Rideout and Hamel reported that as many as 29 percent of preschool children (children between two and six years old) in the United States had played console video games, and 18 percent had played hand-held ones. Given young children's insatiable eagerness to learn, coupled with the fact that they are clearly surrounded by these media, we predict that preschoolers will both continue and increasingly begin to adopt video games for personal enjoyment. Although the majority of gaming equipment is still designed for a much older target audience, once a game system enters the household it is potentially available for all family members, including the youngest. Portable systems have done a particularly good job of penetrating the younger market.

Research in the video game market is typically done at two stages: some time close to the end of the product cycle, in order to get feedback from consumers, so that a marketing strategy can be developed; and at the very end of the product cycle to 'fix bugs' in the game. While both of those types of research are important, and may be appropriate for dealing with adult consumers, neither of them aids in designing better games, especially when it comes to designing for an audience that may have

particular needs, such as preschoolers or senior citizens. Instead, exploratory and formative research has to be undertaken in order to truly understand those audiences, their abilities, their perspective, and their needs. In the spring of 2007, our preschool-game production team at Nickelodeon had a hunch that the Nintendo DS - with its new features, such as the microphone, small size and portability, and its relatively low price point — was a ripe gaming platform for preschoolers. There were a few games on the market at the time which had characters that appealed to the younger set, but our game producers did not think that the game mechanics or design were appropriate for preschoolers. What exactly preschoolers could do with the system, however, was a bit of a mystery. So, we set about doing a study to answer the query: What could we expect preschoolers to be capable of in the context of hand-held game play, and how might the child development literature inform us as we proceeded with the creation of a new outlet for this age group?

Our context, in this case, was the United States, although the games that resulted were also released in other regions, due to the broad international reach of the characters. In order to design the best possible DS product for a preschool audience, we were fully committed to the ideals of a 'user-centered approach', which assumes that users will be at least considered, but ideally consulted during the development process. After all, when it comes to introducing a new interactive product to the child market, and particularly such a young age group within it, we believe it is crucial to assess the range of physical and cognitive abilities associated with their specific developmental stage.

Revelle and Medoff (2002) review some of the basic reasons why home entertainment systems, computers, and other electronic gaming devices, are often difficult for preschoolers to use. In addition to their still developing motor skills (which make manipulating a controller with small buttons difficult), many of the major stumbling blocks are cognitive. Though preschoolers are learning to think symbolically, and understand that pictures can stand for real-life objects, the vast majority are still unable to read and write. Thus, using text-based menu selections is not viable. Mapping is yet another obstacle since preschoolers may be unable to understand that there is a direct link between how the controller is used and the activities that appear before them on screen. Though this aspect is changing, in traditional mapping systems real life movements do not usually translate into game-based activity.

Over the course of our study, we gained many insights into how preschoolers interact with various platforms, including the DS. For instance, all instructions for preschoolers need to be in voice-over, and include visual representations, and this has been one of the most difficult areas for us to negotiate with respect to game design on the DS. Because the game cartridges have very limited memory capacity, particularly in comparison to console or computer games, the ability to capture large amounts of voice-over data via sound files or visual representations of instructions becomes limited. Text instructions take up minimal memory, so they are preferable from a technological perspective. Figuring out ways to maximize sound and graphics files, while retaining the clear visual and verbal cues that

we know are critical for our youngest players, is a constant give and take. Another of our findings indicated that preschoolers may use either a stylus, or their fingers, or both although they are not very accurate with either. One of the very interesting aspects of the DS is that the interface, which is designed to respond to stylus interactions, can also effectively be used with the tip of the finger. This is particularly noteworthy in the context of preschoolers for two reasons. Firstly, as they have trouble with fine motor skills and their hand-eye coordination is still in development, they are less exact with their stylus movements; and secondly, their fingers are so small that they mimic the stylus very effectively, and therefore by using their fingers they can often be more accurate in their game interactions.

Questions

1. In 2007, what conclusion did games producers at Nickelodeon come to?
   a. The preschool market was unlikely to be sufficiently profitable.
   b. One of their hardware products would probably be suitable for preschoolers.
   c. Games produced by rival companies were completely.
2. Which problem do the writers highlight concerning games instructions for young children?
   a. Spoken instructions take up a lot of the available memory, inappropriate for preschoolers.
   b. They should put their ideas for new games for preschoolers into practice.
   c. New manufacturing policy led to products which appealed mainly to the US consumers.
3. The study carried out by Nickelodeon …
   a. was based on children living in various parts of the world.
   b. focused on the kinds of game content which interests preschoolers.
   c. investigated the specific characteristics of the target market.
4. Portable gaming systems have done a particularly good job of penetrating the younger market. Which of the following statements does not correspond to particular needs of preschoolers?
   a. Written instructions have to be expressed very simply.
   b. The children do not follow instructions consistently.
   c. The video images distract attention from the instructions.
5. Which is the best title for the reading passage?
   a. An overview of video games software for the preschool market.
   b. Researching and designing video games for preschool children.
   c. The effects of video games on the behavior of young children.

Variant 2

1. *Choose the correct form.*

1. Dear Professor *Michael Smith / Smith Michael.* 2. I am a PhD student at the *University of Kubla*

Khan / Kubla Khan University. 3. I attended the Cole-Ridge conference last week and I found your seminar *being / to be* very interesting. 4. It would be a real pleasure for me to join your research group and do some further research into *innovative dream sequence storage ways / innovative ways to store dream sequences*. 5. Where I think *could I / I could* really add value would be in research work. 6. I have attached a paper and some recent results, which I hope you will *find both / both find* interesting and useful. 7. *It would* / *Would it* suit you if I came from April next year, for a 3–6-month period? 8. I would *be able / have been able* to get funding from my university to cover the *c*osts of a placement period, so I would need no grant or scholarship. 9. Please find *attached / attaching* my CV with the complete list of my publications and a letter of recommendation from my tutor, Professor Shankar. 10. *Thank you in advance / In advance thank you* for any help you may be able to give me.

2. *Choose the correct verb form.*

1. I *would / would like to* submit for publication in the Journal of Future Education the attached paper entitled "A Proposal for Radical Educational Reform" by Adrian Wallwork and Anna Southern. 2. Our aim was *to test / testing* the efficiency of short- and long-duration degree courses. 3. Our study of 15,000 male and female graduates aged between 35 and 55 found that they would perform far better in their careers from a financial point of view if they *undertook / had undertaken* a one-year course at university rather than the traditional three to four-year course. 4. Our key finding is that people on shorter courses *will / would* earn up to 15% more during their lifetime. 5. The implications of this *are / will be* not only for the graduates themselves. 6. In fact, governments *can / could* save considerable amounts of money. 7. Universities (8) *will / would* be free to accept more students. 8. We believe that our findings *will / should* be of great interest to readers of your journal, particularly due to their counterintuitive nature and the fact they go against the general trend that claims that university courses should be increased in length. 9. This research *has not been / was not* published before and is not being considered for publication elsewhere. 10. I *look / am looking* forward to hearing from you.

3. *Fill in the gaps with the appropriate words from the list.*

manipulate, practice, implicit, currency, appreciative, widespread, eventually, thereby, restored, commodity

1. Reports suggest damage is _____ as a result of the flood. 2. In March 1998, the elected government of Sierra Leone was _____ to power, replacing the military regime which had taken control in a coup in the previous year. 3. Any aid given to developing countries by the developed nations seems to carry with it an _____ agreement that the developed country will get something in return.

4. My cousin just opened a dental _____ here in town. 5. Liechtenstein does not have its own _____, but uses the Swiss franc. 6. Predators have a beneficial effect on the health of their prey, in that they often eat the old or diseased animals, _____ keeping the species strong. 7. Psychologists describe thinking as a set of processes used to _____ knowledge, ideas and images. 8. The stocks were once a much-desired _____, but have since lost over 70% of their original value. 9. This disease will probably kill me _____, but it's not going to keep me from living in the meantime. 10. George W. Crane once suggested that _____ words are the most powerful force for good on earth.

4. ***Read the text and answer the questions below it.***

Experience versus speed

Certain mental functions slow down with age, but the brain compensates in ways that can keep seniors as sharp as youngsters. Jake, aged 16, has a terrific relationship with his grandmother Rita, who is 70. They live close by, and they even take a Spanish class together twice a week at a local college. After class, they sometimes stop at a cafe for a snack. On one occasion, Rita tells Jake, 'I think it's great how fast you pick up new grammar. It takes me a lot longer.' Jake replies, 'Yeah, but you don't seem to make as many silly mistakes on the quizzes as I do. How do you do that?'

In that moment, Rita and Jake stumbled across an interesting set of differences between older and younger minds. Popular psychology says that as people age their brains 'slow down'. The implication, of course, is that elderly men and women are not as mentally agile as middle-aged adults or even teenagers. However, although certain brain functions such as perception and reaction time do indeed take longer, that slowing down does not necessarily undermine mental sharpness. Indeed, evidence shows that older people are just as mentally fit as younger people because their brains compensate for some kinds of declines in creative ways that young minds do not exploit.

Just as people's bodies age at different rates, so do their minds. As adults advance in age, the perception of sights, sounds and smells takes a bit longer, and laying down new information into memory becomes more difficult. The ability to retrieve memories also quickly slides and it is sometimes harder to concentrate and maintain attention.

On the other hand, the ageing brain can create significant benefits by tapping into its extensive hoard of accumulated knowledge and experience. The biggest trick that older brains employ is to use both hemispheres simultaneously to handle tasks for which younger brains rely predominantly on one side. Electronic images taken by cognitive scientists at the University of Michigan, for example, have demonstrated that even when doing basic recognition or memorization exercises, seniors exploit the left and right side of the brain more extensively than men and women who are decades younger. Drawing on both sides of the brain gives them a tactical edge, even if the speed of each hemisphere's process is slower.

In another experiment, Michael Falkenstein of the University of Dortmund in Germany found that when elders were presented with new computer exercises, they paused longer before reacting and took longer to complete the tasks, yet they made 50% fewer errors, probably because of their more deliberate pace.

One analogy for these results might be the question of who can type a paragraph 'better': a 16-year-old who glides along at 60 words per minute but has to double back to correct a number of mistakes or a 70-year-old who strikes keys at only 40 words per minute but spends less time fixing errors? In the end, if 'better' is defined as completing a clean paragraph, both people may end up taking the same amount of time.

Computerized tests support the notion that accuracy can offset speed. In one so-called distraction exercise, subjects were told to look at a screen, wait for an arrow that pointed in a certain direction to appear, and then use a mouse to click on the arrow as soon as it appeared on the screen. Just before the correct symbol appeared, however, the computer displayed numerous other arrows aimed in various other directions. Although younger subjects cut through the confusion faster when the correct arrow suddenly popped up, they more frequently clicked on incorrect arrows in their haste.

Older test takers are equally capable of other tasks that do not depend on speed, such as language comprehension and processing. In these cases, however, the elders utilize the brain's available resources in a different way. Neurologists at Northwest University came to this conclusion after analyzing 50 people ranging from age 23 to 78. The subjects had to lie down in a magnetic resonance imaging (MRI) machine and concentrate on two different lists of printed words posted side by side in front of them. By looking at the lists, they were to find pairs of words that were similar in either meaning or spelling.

The eldest participants did just as well on the tests as the youngest did, and yet the MRI scans indicated that in the elders' brains, the areas which are responsible for language recognition and interpretation were much less active. The researchers did find that the older people had more activity in brain regions responsible for attentiveness. Darren Gleitman, who headed the study, concluded that older brains solved the problems just as effectively but by different means.

Questions

1. The conversation between Jake and Rita is used to give an example of …
   a. the way we learn languages.
   b. the changes that occur in our brains over time.
   c. the fact that it is easier to learn a language at a young age.
2. What did Michael Falkenstein discover?
   a. Seniors take longer to complete tasks but with greater accuracy.
   b. Older people do not cope well with new technology.

c. Older people solved the problems just as effectively but by different means.

d. The importance of young and old people doing things together.

3. What can be concluded about the role of brain regions in solving problems?

a. They undermine mental sharpness.

b. They determine hemispheres` processes.

c. They are in line with particular mental activities.

4. What was shown by researchers at the University of Michigan?

a. Old people use both parts of their brain more than young people.

b. seniors are more active in language recognition and interpretation.

c. older brains solve problems just like men and women who are decades younger.

d. accuracy can offset speed.

5. The passage states that elderly people solve problems effectively but by different means. Which evidence from the text supports this conclusion?

a. The speed of each hemisphere's process is slower.

b. They are much less active in language recognition and interpretation.

c. Regions of older brains responsible for attentiveness are more active.

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***Appendix* 1**

SPEAKING IN ACADEMIC CONTEXTS

Useful language: Academic Presentations

Academic seminars and presentations often take the following form.

a. A. PRESENTATION

1. Introduction

State what you will do

State how you will do it

2. Main Body

State your points: Information and argument

3. Conclusion

Summarize

Invite questions

B. DISCUSSION / QUESTIONS

A. Presentation

1. Introduction

State what you will do

What I'd like to do is to discuss ...

What I intend to do is to explain ...

In my talk today, ...

My topic today is ...

Today, I'm going to talk about ...

I'm going to talk to you about ...

My colleagues and I are going to give a short presentation on ...

Today I want to consider ...

In this talk, I would like to concentrate on ...

The subject of this talk is ...

The purpose of this talk is to ...

This talk is designed to ...

State how you will do it

I'm going to deal with three aspects of the subject.

I'm going to divide my presentation into three sections.

I've divided my presentation into three sections.

I thought it would be useful to divide my talk into three sections.

This subject can be looked at under the following headings: ....

I'll take about ... minutes.

The talk should last about ... minutes.

I'll be happy to answer questions at the end.

If you have any questions, I'll try to answer them afterwards.

If you have any questions, please feel free to interrupt.

2. Main body

Ordering points

Firstly, …

To start with, …

First of all, …

Secondly, …

Next …

Then …

Thirdly, …

Lastly, …

Finally, …

Giving examples

For example, ...

For instance, ...

And as proof of that, ...

Remember ...

You only have to think of ...

Emphasizing

Furthermore ...

What's more, ...

This supports my argument that ...

It follows, therefore, that ...

Referring back to what you have said

As I said at the beginning, ...

In the first part of my talk, I said ...

As I mentioned earlier, ...

I told you a few minutes ago that ...

Putting it in other words

In other words, ...

That is to say, ...

To put it another way, ...

The point I'm making is ...

What I'm suggesting is ...

Let me put it another way.

Using visuals

On this graph, ...

Take a look at this.

Let's have a look at this.

I'd like you to look at this.

I'd like to draw your attention to ...

Here we can see ...

The ... represents ...

The graph illustrates ...

As you can see, ...

If you look closely, you'll see ...

Moving on

I'd like now to move on to ...

Turning now to ...

Moving on now to ...

Having looked at ..., I'd now like to consider ...

Now, let's turn to ...

I now want to turn to ...

The next point is ...

Another interesting point is ...

The next aspect I'd like to consider is ...

I'd now like to turn to ...

3. Conclusion

Concluding

So, ...

We've seen that ...

First, we looked at ... and we saw that ...

Then we considered ... and I argued ...

In short ...

In brief, we have looked at ...

To sum up ...

In conclusion, I'd like to emphasize that ...

I think that covers most of the points.

That completes my presentation.

Thank you for your attention.

Invite questions

That covers the main points. If you have any comments or questions, I'll be happy to hear them.

So, that explains my main point. Does anyone have any comments or questions?

I'd be glad to try and answer any questions.

B. DISCUSSION/QUESTIONS

Encouraging participation

Does anyone have any comments or questions?

So, is this the same as your experience?

Do you agree with what X has just said?

So, Y, what is your opinion of this?

Interrupting

If I could just come in here.

Sorry to interrupt, but ...

I'd just like to say that ...

Getting clarification

I didn't understand what you said about ...

I'm sorry, I didn't catch what you said about ...

I'm sorry, could you repeat what you said about ...

What does ... mean?

I'm not sure what you mean.

I don't see what you mean.

Could we come back to that?

Sorry, but I'm not quite clear on ...

I'd like to ask you about ...

What did you mean when you said ...?

Could you be more specific about ...?

Could you expand a little bit on what you said about ...?

Could you give an example of ...?

Could you explain in more detail?

So, you're telling me that I can't ...?

So, what you're saying is that ...?

So, you mean that ...?

Are you saying that ...?

Am I correct in assuming that ...?

Let me just make sure - your point is that ...

If I have understood you correctly, your point is that ...

Following up a question

That's not really what I was asking. My question is about ...

Perhaps I didn't make my question clear. I fact what I asked was ...

I think you've answered a slightly different question. What I would like to know is …

I understand that but what I actually had in mind was ...

Sorry, I'm still not clear about ...

Dealing with difficult questions

... is important but it's too complex for us to deal with here.

I think the aim of this talk is to focus on ... rather than ...

It's too early for us to say whether ...

We don't have enough evidence to show that ...

That's not something I've had time to deal with, but ...

I'd prefer to deal with that point later.

Agreeing

I couldn't agree more.

On the whole, I think the speaker's arguments are fair.

I (quite) agree.

I think you're absolutely right.

That's a very good point.

You've got a very good point there.

I fully support what you say.

I totally agree.

Exactly!

Doubt and reservation

Well … maybe … possibly …

I'm not so sure about that.

You may be right.

I don’t think I’d say that.

Yes, but don't you think ...?

I can see your point, but ...

I think that's debatable.

Perhaps, but don't you think that ...

I see what you mean but ...

I agree to some extent, but ....

It seems to me ...

I tend to think ...

Disagreeing

But don't you think that ...?

I see what you mean, but ...

But isn't it really a question of ...

But what about ...?

But surely ...?

I take your point, but, ...

But all the evidence suggests that ....

I'm afraid I can't agree with ... on this matter.

I wouldn't say that.

I don't agree at all.

I can't accept that.

Giving yourself time to think

ah, er, erm, uh

Repeat the question.

Why do I think that ...?

Ask for repetition.

I'm sorry. Could you repeat the question, please?

Give a vague opinion.

It's difficult to say ...

I'm not sure, but ...

Ask for clarification.

Could you say what you mean by ...

***Appendix* 2**

HOW TO WRITE AN ACADEMIC ESSAY

In order to answer this, let us first look at a sample question.

Writing Example 1:

Developments in Information Technology

Essay Task

You should spend about 40 minutes on this task. Present a written argument to an educated reader with no specialist knowledge of the following topic.

> In the last 20 years, there have been significant developments in the field of information technology (IT), for example, the World Wide Web and communication by email. However, future developments in IT are likely to have more negative effects than positive. To what extent do you agree with this view?

Give reasons for your answer and include any relevant examples from your own experience or knowledge. You should write at least 250 words.

An academic essay is structured like any other essay; you just need to make it shorter. There are three key elements: 1) Introduction; 2) Body Paragraphs; 3) Conclusion.

1. Introduction

You should keep your introduction for the essay short. You should do just two things: State the topic of the essay, using some basic facts (that you may be able to take from the question). Say what you are going to write about. Here is an example introduction for the above essay question about IT.

> *The last two decades have seen enormous changes in the way people's lives are affected by IT, with many advances in this field. However, while these technological advances have brought many benefits to the world, it can be argued that future IT developments will produce more negative effects than positive ones.*

As you can see, the first sentence makes sure it refers to the topic (IT) and uses facts about IT taken from the question. Note that these are paraphrased - you must not copy from the rubric! The second part then clearly sets out the what the essay will be about and confirms the writer’s opinion.

2. Body Paragraphs

For an essay, you should have 2 or 3 body paragraphs — no more, and no less.

For your body paragraph, each paragraph should contain one controlling idea, followed by supporting sentences. Let's look at the first paragraph for the essay about IT. The essay is about the benefits and drawbacks of IT, so these will need to be discussed in separate paragraphs. Here is the first body paragraph.

> ***To begin with, these developments have brought many benefits to our lives.*** *Email has made communication, especially abroad, much simpler and faster, resulting in numerous benefits for education, commerce and business. Furthermore, the World Wide Web means that information on every conceivable subject is now available to us. It is evident that this has made life far easier and more convenient for large numbers of people.*

The first sentence in bold (the topic sentence) tells us what the paragraph is about, and there are two supporting ideas, which are underlined. Most of the essay will focus on the negative aspects of IT, as the writer says there are more negative effects in the introduction. So, the next two paragraphs are about these. The topic sentence in the next paragraph therefore tells us we are changing the focus to the negative points.

> ***Nevertheless, the effects of this new technology have not all been beneficial.*** *For example, many people feel that the widespread use of email is destroying traditional forms of communication such as letter writing, telephone and face-to-face conversation. Furthermore, with the ever-increasing use of information technology these negative elements are likely to increase in the future.*

The final body paragraph gives the last negative effect.

> *In addition, the large size of the Web has meant that it is nearly impossible to regulate and control. This has led to many concerns regarding children accessing unsuitable websites and viruses. Unfortunately, this kind of problem might even get worse in the future at least until more regulated systems are set up.*

3. Conclusion

The conclusion only needs to be one or two sentences, and you can do the following: Re-state what the essay is about (re-write the last sentence of your introduction in different words). Give some thoughts about the future Here is an example.

> *In conclusion, developments in IT have brought many benefits, yet I believe developments relating to new technology in the future are likely to produce many negative effects that will need to be addressed very carefully.*

The full Essay

The last two decades have seen enormous changes in the way people's lives are affected by IT, with

many advances in this field. However, while these technological advances have brought many benefits to the world, it can be argued that future IT developments will produce more negative effects than positive ones.

To begin with, these developments have brought many benefits to our lives. Email has made communication, especially abroad, much simpler and faster, resulting in numerous benefits for education, commerce and business. Furthermore, the World Wide Web means that information on every conceivable subject is now available to us. It is evident that this has made life far easier and more convenient for large numbers of people.

Nevertheless, the effects of this new technology have not all been beneficial. For example, many people feel that the widespread use of email is destroying traditional forms of communication such as letter writing, telephone and face-to-face conversation. Furthermore, with the ever-increasing use of information technology these negative elements are likely to increase in the future.

In addition, the large size of the Web has meant that it is nearly impossible to regulate and control. This has led to many concerns regarding children accessing unsuitable websites and viruses. Unfortunately, this kind of problem might even get worse in the future at least until more regulated systems are set up.

In conclusion, developments in IT have brought many benefits, yet I believe developments relating to new technology in the future are likely to produce many negative effects that will need to be addressed very carefully.

(259 words)

Comments

The essay introduction talks in general about the increasing use of IT, thus introducing the topic well. The thesis then clearly sets out the writer's opinion. The following paragraph mentions the present benefits of these developments, but the opening sentence in the third paragraph is a qualifying statement (Nevertheless, not all the effects ...), so the writer can now focus on the negative elements. The fourth paragraph provides two other negative examples (lack of regulation, viruses). Both paragraphs suggest that these problems will continue in the future. The essay concludes with a clear opinion that agrees with the statement. Overall, it is a well-balanced text that mentions the present situation (... this has made life ...) but importantly, also refers to the future of IT (... likely to increase ..., might get worse ...).

Writing Example 2:

University Education

Sample Essay Task

You should spend about 40 minutes on this task. Write about the following topic.

> Some people believe the aim of university education is to help graduates get better jobs. Others believe there are much wider benefits of university education for both individuals and society. Discuss both views and give your opinion.

Give reasons for your answer and include any relevant examples from your own experience or knowledge. You should write at least 250 words.

Model Answer

These days, more and more people are making the choice to go to university. While some people are of the opinion that the only purpose of a university education is to improve job prospects, others think that society and the individual benefit in much broader ways.

It is certainly true that one of the main aims of university is to secure a better job. The majority of people want to improve their future career prospects and attending university is one of the best ways to do this as it increases a person's marketable skills and attractiveness to potential employers. In addition, further education is very expensive for many people, so most would not consider it if it would not provide them with a more secure future and a higher standard of living. Thus, job prospects are very important.

However, there are other benefits for individuals and society. Firstly, the independence of living away from home is a benefit because it helps the students develop better social skills and improve as a person. A case in point is that many students will have to leave their families, live in halls of residence and meet new friends. As a result, their maturity and confidence will grow enabling them to live more fulfilling lives. Secondly, society will gain from the contribution that the graduates can make to the economy. We are living in a very competitive world, so countries need educated people in order to compete and prosper.

Therefore, I believe that although a main aim of university education is to get the best job, there are clearly further benefits. If we continue to promote and encourage university attendance, it will lead to a better future for individuals and society.

(279 words)

Comments

The writer in this writing example has a clear thesis in the second sentence of the introduction,

establishing that two sides of this issue will be discussed (While some people are of the opinion ... others think that ...).

Looking at the structure, the topic sentences make it clear when the first opinion is being discussed (It is certainly true that one of the main aims of university is to secure a better job.) and when the writer is moving onto the next opinion (However, there are other benefits for individuals and society.).

Connectors (To begin ... Also ... Firstly ... Secondly) are used well to introduce each new supporting idea. Further connectors (For example ... A case in point is that ... As a result ...) are used to expand on these ideas.

Finally, the writer has demonstrated that they are able to use complex sentence structures (While ... that ... in order to ... as ...), and has discussed both views and combined this with his/her opinion, thus ensuring the question has been answered.

Writing Example 3:
Alternative Medicine

Sample Essay Task

You should spend about 40 minutes on this task.

Present a written argument to an educated reader with no specialist knowledge of the following topic.

> Currently there is a trend towards the use of alternative forms of medicine. However, at best these methods are ineffective, and at worst they may be dangerous. To what extent do you agree with this statement?

Give reasons for your answer and include any relevant examples from your own experience or knowledge. You should write at least 250 words.

Model Answer

Alternative medicine is not new. It is accepted that it pre-dates conventional medicine and it is still used by many people all over the world. I am unconvinced that it is dangerous, and feel that both alternative and conventional medicine can be useful.

There are several reasons why the conventional medical community is often dismissive of alternatives. Firstly, there has been little scientific research into such medicine, so there is a scarcity of evidence to support the claims of their supporters. Furthermore, people often try such treatment because of recommendations from friends, and therefore come to the therapist with a very positive

attitude, which may be part of the reason for the cure. Moreover, these therapies are usually only useful for long-term, chronic conditions. Acute medical problems, such as accidental injury, often require more conventional methods.

On the other hand, there remain strong arguments for the use of alternatives. Despite the lack of scientific proof, there is a lot of anecdotal evidence to suggest that these therapies work. In addition, far from being dangerous, they often have few or no side effects, so the worst outcome would be no change. One of the strongest arguments for the effectiveness of alternative therapies in the West is that, whilst conventional medicine is available without charge, many people are prepared to pay considerable sums for alternatives. If they were totally unhelpful, it would be surprising if this continued.

I strongly believe that conventional medicine and alternative therapies can and should coexist. They have different strengths, and can both be used effectively to target particular medical problems. The best situation would be for alternative therapies to be used to support and complement conventional medicine.

(280 words)

Comments

The writer in this sample essay introduces the topic in the introductory paragraph (Alternative medicine ...) and puts forward a clear view on the issue (I am unconvinced ... and feel ...).

The essay has a well-balanced argument looking at both sides of the issue. The first body paragraph expresses some doubt about alternative therapies (... little scientific research ... only useful for long term...), but in the second body paragraph the writer takes a different view (On the other hand ...) and examines the benefits (... few side effects).

The writer's concluding paragraph offers a strong opinion (I strongly believe ...) and sums up the fact that both types of treatment are valid today. There is also a good range of grammatical structures (If they were totally unhelpful, it would be ...), and connectors (despite the fact, in addition, finally).

Useful vocabulary / phrases to open the essay

Many / some people claim / believe that...
There is no denying that...
It is often said that...
These days... / Nowadays... / In this day and age...
It goes without saying that...
It is universally accepted that...
We live in an age when many of us are...
People are divided in their opinion regarding...
.... is one of the most important issues...

Whether .... or .... is a controversial issue...

Useful vocabulary/phrases to end the Introduction Part

Let us examine both views before reaching a concrete decision.

The following paragraphs discuss whether ... or ... and reach a reasonable conclusion.

The following essay takes a look at both sides of the argument.

My two cents go for...

However, I strongly believe that...

I oppose the view and my reasons will be explained in the following paragraphs.

I will support this view with arguments in the following paragraphs.

I personally believe that...

Thus, the advantages far outweigh the disadvantages...

I wholeheartedly believe that this trend should be changed.

Vocabulary for the Opinion Part

In my opinion...

I strongly agree with the idea that...

I strongly disagree with the given topic...

I think...

My opinion is that...

Personally speaking...

In my view...

I believe...

Apparently...

According to me...

From my point of view... / From my perspective...

As far as I am concerned...

I realize that ...

To my way of thinking...

It seems to me that... / To me... / To my mind...

My own view on the matter is...

It appears that...

I feel that... / I understand... / I suppose...

Examples

1. But in my opinion, giving access to a mobile phone and the internet to every unemployed person is a matter of great dispute. I believe, this idea can help the countries who have sufficient funds for the whole fiscal year and already adopted technologies like the internet for a very long period. However, this might turn out a complete loss for an undeveloped country.
2. I strongly agree with the idea that the gender issue is only a determinant in the battle of the sexes, not the battles among nations and peoples. It is therefore impertinent, if not irrational, to conclude that world conflicts result from the rule of a particular gender and the finer sex would do a better job at prevailing peace if selectively put at the helm of human nations.

Vocabulary for the 2nd Paragraph Part

It is true that...
First... / First of all... / Firstly... / Initially...
To begin with... / To start with...
Let us take a look at...
It is worth considering...
In the first place...
Though it is true that...
Some people believe that...
Many people think that...
According to many...
Many support the view that...
On the one hand...

Examples

1. It is true that an unemployed educated person with a mobile phone and the internet connection can get more access to the local and foreign job sectors and can use these technologies to get a job or become self-employed.
2. First of all, the maximum number of cars are owned by the rich people and fuel price would not restrain them from using the cars. The price of fuel, in fact, increased significantly over the past 12 years and that has done nothing to reduce car usage.

Vocabulary for the 3rd, 4th ... Paragraph Part

Second(ly)... / Third(ly)... / Then...
Next... / After that...

And...

Again... / Also... / Besides... / Likewise... / In addition...

Consequently...

What's more... / Furthermore... / Moreover...

Other people think that... / Other people believe that...

On the other hand...

Apart from that...

Finally...

Last but not least...

Examples

1. Besides, unemployed persons living in urban areas; can easily get the information related to the job-offering companies with these technologies... Furthermore, the use of these technologies give them advantages than others...
2. Apart from that, computers would become more powerful and they will have superior artificial intelligence. We will have robots to do hazardous works like mining and outer space research. Surprisingly, e-commerce would be in more convenient form and most of the people will purchase online rather than going to shops in person.

Vocabulary to show the comparison

In the same way...

Likewise... / Similarly... / Similar to...

Like the previous point...

Also...

At the same time...

Just as...

Examples

1. Similarly, all the companies and offices are becoming automated and using computers, the internet and other technologies vastly than any other time in history... .
2. At the same time software could be used for many purposes such as learning through computers, accounting in computers, drawing, storage of information, sending information from one person to other persons etc.

Vocabulary to show contrast

On the other hand...

On the contrary... / Oppositely...

However...

Nevertheless... / Nonetheless...

Alternatively, ...

Unlike...

While... / Whilst...

Although... / Though... / Even though...

Despite... Despite the fact that... / In spite of... / In spite of the fact that...

In contrast to this...

Then again...

On the other hand...

Even so... / Yet... / Meanwhile...

Examples

1. On the contrary, poor countries suffer from the lack of sufficient budgets to ensure some very basic needs of people like health, education, medicines etc. Then again, those countries don't have a chance to spend a lot of money to initiate a superficial project...

2. Unlike a TV, a radio cannot display an image or a video, and the communication is limited to voice only. Typically, a radio is used for access information such as news and live traffic updates...

Vocabulary to show an example

As an example... / For instance... / For example...

Like... / As... / Such as...

Among others...

Particularly... / In particular...

Regarding...

Namely...

With respect to...

As far .... is concerned...

To show an example... / To give an example... / To cite an example... / An example is... / ...could be a good/ideal example here

As an evidence... / To illustrate...

To paraphrase...

A case...

When it comes to...

Examples

1. As an example, many governments of the first world countries have initiated other projects like:..
2. For example, if a public bus gets busted in the middle of a road, the passenger can easily leave it a look for another one.

Vocabulary to present an idea

Research shows that... / Research has found that...

When it comes to... / With respect to...

Not only... but also...

In terms of...

Examples

1. Research shows that employment opportunity and crime ratio in a city has a deep underlying relationship and that is why...
2. When it comes to deciding who should be responsible to teach children the discipline...
3. With respect to mix-school classrooms, it is quite evident that...

Phrases to introduce more ideas / examples

Furthermore...

In addition...

On top of that...

Besides...

What is more...

Another point worth noting is...

Another factor to consider is...

Furthermore...

Not only ... but also...

Also...

Examples

1. On top of that, rich countries emit more CO_2 than the rest of the world does and this is why they have greater responsibilities.

2. Another point worth noting is the number of TV channels we have these days.

3. What is more, leaders are born not made.

Vocabulary to show consequence, effects or result

As a result...

Consequently... / As a consequent... / As an effect...

Thus...

So...

The reason why...

Therefore...

On account of...

Because of...

Hence...

Eventually...

For this / that reason...

Thereby...

Due to...

Owing to...

Examples

1.Therefore, we should avoid using our budget in an uncertain project...

2.As a result, people are struggling much to lead a healthy and secure life...

3. Consequently, local residents will be able to find more job opportunities in this factory and have a better socio-economic status...

Vocabulary to sum up at the end of a paragraph

To sum up...

In short...

In a word...

To put it simply...

That is to say...

To repeat in short....

To summarise...

Examples

1. In a word, I think, the idea can be very useful for the developing countries but for us, it might be sinister...
2. That is to say, we must ensure the safety of our children first…
3. In short, the overall infrastructure of the area will develop.

Vocabulary to make a point stronger / adding emphasis

It goes without saying that...

Obviously...

Needless to say...

There is little doubt that...

Although... / Thought...

Nonetheless... / Nevertheless...

Still... / Yet...

After all...

Even if...

Therefore...

Thus...

Examples

1. Thus, air and water pollution caused by this factory will ruin the local environment and wildlife fundamentally...
2. Although industrialization is necessary for the growth of a country it must be regulated. The proper measures must be in place to reduce the negative impacts of byproducts on the environment.

Vocabulary for clarifying or rephrasing

To put it simply... / To put in another way...

That is to say...

In other words...

Examples

1. To put in another way, nuclear power has a great potential to provide power requirement of the industries all around the world.
2. To put it simply, co-education can bring advantages that far outweigh the demerits it has.

Other transitional words / connective words

Then...

Else...

Otherwise...

Besides...

As soon as...

As much as...

Examples

1. As soon as we realize the problem, ...
2. Otherwise, the unemployed graduates' number will keep on increasing …

Vocabulary to express opinion

In my opinion…

From my point of view...

Second / Secondly…

On the other hand,…

Last but not least…

In conclusion / To conclude...

Vocabulary for the conclusion part

In conclusion... / To conclude... / To conclude with...

In summary... / To sum up... / To summarise...

In general...

In short...

All in all...

Overall...

On the whole...

To draw the conclusion...

To elucidate…

All things considered...

By and large...

Taking everything into consideration... / Taking everything into account...

Weighing up both sides of the argument...

Examples

1. To sum up, if the population explosion continues, many more people will die of starvation in poor countries, and life in the cities, even in affluent nations, will become increasingly difficult.
2. To conclude, I recommend that the only sensible way to solve this problem is to educate young people about the dangers of drug use and to take steps to reduce the pressure of competition placed upon them.
3. In conclusion, nuclear technology certainly has positive uses but is nonetheless dangerous. However, it would have been better if it had never been used to create nuclear weapons. If life on Earth is to continue, all the nuclear nations of the world should agree to disarm as soon as possible.

Appendix 3

LATIN ABBREVIATIONS AND SHORTENINGS

There are some Latin abbreviations and shortenings that are common in academic writing.

Table 7. Latin abbreviations and shortenings

Abbreviation/ shortening	Meaning	Translation
ab ovo		с самого начала
A.D.	Anno Domini	нашей эры, “год нашего бога”
ad hoc		специальный, ситуативный
a posteriori		основанный на опыте
a priori		априори, не зависимый от опыта
B.C.	Before Christ	до нашей эры
cf.	confer=compare	сравни
c., ca	circa	приблизительно, около
e.g.* (*exempli gratia*)	for example	в качестве примера
et al. (*et alii*)	and others (people)	и другие (авторы, коллеги)
etc. (*et cetera*)	and so on	и тому подобное, и так далее
et seq. *(et sequentia)*	and the following	и далее, и последующее
i.e. (*id est*)	that is	то есть
ibid. (*ibidem*)	in the same place	то же место
ms., mss., mscr.	manuscriptum	рукопись
N.B.	nota bene	обрати внимание
op. cit.	opere citato	цитируемая работа,
p.a., per an.	per annum= yearly	ежегодно, в год
pro et con	pro et contra	за и против
Q.E.D.	quod erat demonstrandum	что и требовалось доказать
Sc.	scilicet=namely	то есть, аналог viz.
s.l.	sensu lato	в широком смысле
s.s.	sensu stricto	в строгом смысле
C.V.	curriculum vitae	краткое описание жизни и профессиональных навыков (резюме)
verbatim		буквально, дословно
vice versa		наоборот
viz.	videre licet	а именно
vs.	versus	против, в сравнении с

* Make sure not to confuse “e.g.” and “i.e.”. In general, it is best to avoid using these abbreviations in the main text, especially in US English. Instead, put them inside parentheses followed by a comma, or write out full words.

a) Many species of primates, e.g. orangutans, are endangered.
b) Many species of primates (e.g., orangutans) are endangered.
c) Many species of primates, such as orangutans, are endangered.

Appendix 4

SUBLISTS OF THE ACADEMIC WORD LIST

Sublist 1

analyze
- analyzed
- analyzer
- analyzers
- analyses
- analyzing
- analysis
- analyst
- analysts
- analytic
- analytical
- analytically
- analyze
- analyzed
- analyzes
- analyzing

approach
- approachable
- approached
- approaches
- approaching
- unapproachable

area
- areas

assess
- assessable
- assessed
- assesses
- assessing
- assessment
- assessments
- reassess
- reassessed
- reassessing
- reassessment
- unassessed

assume
- assumed
- assumes
- assuming
- assumption
- assumptions

authority
- authoritative
- authorities

available
- availability
- unavailable

benefit
- beneficial
- beneficiary
- beneficiaries

benefited
benefiting
benefits
concept
conception
concepts
conceptual
conceptualization
conceptualize
conceptualized
conceptualizes
conceptualizing
conceptually
consist
consisted
consistency
consistent
consistently
consisting
consists
inconsistencies
inconsistency
inconsistent
constitute
constituencies
constituency
constituent
constituents
constituted
constitutes
constituting
constitution
constitutions
constitutional
constitutionally
constitutive
unconstitutional
context
contexts
contextual
contextualize
contextualized
contextualizing
uncontextualized
contextualize
contextualized
contextualizing
uncontextualized
contract
contracted
contracting
contractor

- contractors
- contracts

create
- created
- creates
- creating
- creation
- creations
- creative
- creatively
- creativity
- creator
- creators
- recreate
- recreated
- recreates
- recreating

datum
- data

define
- definable
- defined
- defines
- defining
- definition
- definitions
- redefine
- redefined
- redefines
- redefining
- undefined

derive
- derivation
- derivations
- derivative
- derivatives
- derived
- derives
- deriving

distribute
- distributed
- distributing
- distribution
- distributional
- distributions
- distributive
- distributor
- distributors
- redistribute
- redistributed
- redistributes
- redistributing

redistribution
economy
economic
economical
economically
economics
economies
economist
economists
uneconomical
environment
environmental
environmentalist
environmentalists
environmentally
environments
establish
established
establishes
establishing
establishment
establishments
disestablish
disestablished
disestablishes
disestablishing
disestablishment
estimate
estimated
estimates
estimating
estimation
estimations
over-estimate
overestimate
overestimated
overestimates
overestimating
underestimate
underestimated
underestimates
underestimating
evident
evidenced
evidence
evidential
evidently
export
exported
exportation
exporters
exporting

- exports
- factor
  - factored
  - factoring
  - factors
- finance
  - financed
  - finances
  - financial
  - financially
  - financier
  - financiers
  - financing
- formula
  - formulae
  - formulas
  - formulate
  - formulated
  - formulating
  - formulation
  - formulations
  - reformulate
  - reformulated
  - reformulating
  - reformulation
  - reformulations
- function
  - functional
  - functionally
  - functioned
  - functioning
  - functions
- identify
  - identifiable
  - identification
  - identified
  - identifies
  - identifying
  - identities
  - identity
  - unidentifiable
- income
  - incomes
- indicate
  - indicated
  - indicates
  - indicating
  - indication
  - indications
  - indicative
  - indicator
  - indicators

individual
- individualized
- individuality
- individualism
- individualist
- individualists
- individualistic
- individually
- individuals

interpret
- interpretation
- interpretations
- interpretative
- interpreted
- interpreting
- interpretive
- interprets
- misinterpret
- misinterpretation
- misinterpretations
- misinterpreted
- misinterpreting
- misinterprets

reinterpret
- reinterpreted
- reinterprets
- reinterpreting
- reinterpretation
- reinterpretations

involve
- involved
- involvement
- involves
- involving
- uninvolved

issue
- issued
- issues
- issuing

labor
- labor
- labored
- labors
- labored
- laboring
- labors

legal
- illegal
- illegality
- illegally
- legality
- legally

legislate
- legislated
- legislates
- legislating
- legislation
- legislative
- legislator
- legislators
- legislature

major
- majorities
- majority

method
- methodical
- methodological
- methodologies
- methodology
- methods

occur
- occurred
- occurrence
- occurrences
- occurring
- occurs
- reoccur
- reoccurred
- reoccurring
- reoccurs

percent
- percentage
- percentages

period
- periodic
- periodical
- periodically
- periodicals
- periods

policy
- policies

principle
- principled
- principles
- unprincipled

proceed
- procedural
- procedure
- procedures
- proceeded
- proceeding
- proceedings
- proceeds

process

- processed
- processes
- processing

require
- required
- requirement
- requirements
- requires
- requiring

research
- researched
- researcher
- researchers
- researches
- researching

respond
- responded
- respondent
- respondents
- responding
- responds
- response
- responses
- responsive
- responsiveness
- unresponsive

role
- roles

section
- sectioned
- sectioning
- sections

sector
- sectors

significant
- insignificant
- insignificantly
- significance
- significantly
- signified
- signifies
- signify
- signifying

similar
- dissimilar
- similarities
- similarity
- similarly

source
- sourced
- sources
- sourcing

specific
- specifically
- specification
- specifications
- specificity
- specifics

structure
- restructure
- restructured
- restructures
- restructuring
- structural
- structurally
- structured
- structures
- structuring
- unstructured

theory
- theoretical
- theoretically
- theories
- theorist
- theorists

vary
- variability
- variable
- variables
- variably
- variance
- variant
- variants
- variation
- variations
- varied
- varies
- varying
- invariable
- invariably

Sublist 2

achieve
- achievable
- achieved
- achievement
- achievements
- achieves
- achieving

acquire
- acquired
- acquires
- acquiring
- acquisition

- acquisitions
- administrate
  - administrates
  - administration
  - administrations
  - administrative
  - administratively
  - administrator
  - administrators
- affect
  - affected
  - affecting
  - affective
  - affectively
  - affects
- alternative
  - alternatively
  - alternatives
  - appropriacy
- appropriate
  - appropriately
  - appropriateness
- aspect
  - aspects
- assist
  - assistance
  - assistant
  - assistants
  - assisted
  - assisting
  - assists
- category
  - categories
  - categorization
  - categorize
  - categorized
  - categorizes
  - categorizing
  - categorization
  - categorized
  - categorizes
  - categorizing
- chapter
  - chapters
- circumstance
  - circumstances
- comment
  - commentaries
  - commentary
  - commentator
  - commentators
  - commented

commenting
comments
commission
commissioned
commissioner
commissioners
commissioning
commissions
communities
community
compensate
compensated
compensates
compensating
compensation
compensations
compensatory
complex
complexities
complexity
component
componentry
components
computable
computation
computational
computations
compute
computed
computer
computerized
computers
computing
conclude
concluded
concludes
concluding
conclusion
conclusions
conclusive
conclusively
conduct
conducted
conducting
conducts
consensus
consent
consented
consenting
consents
consequence
consequences

consequent
    consequently
considerable
    considerably
    constancy
constant
    constantly
    constants
constrain
    constrained
    constraining
    constrains
    constraint
    constraints
construct
    constructed
    constructing
    construction
    constructions
    constructive
    constructs
consume
    consumed
    consumer
    consumers
    consumes
    consuming
    consumption
contribute
    contributed
    contributes
    contributing
    contribution
    contributions
    contributor
    contributors
convene
    convened
    convenes
    convening
    convention
    conventional
    conventionally
    conventions
coordinate
    co-ordinate
    coordinated
    coordinated
    coordinates
    co-ordinates
    coordinating
    coordinating

- coordination
- co-ordination
- coordinator
- coordinator
- coordinators
- coordinators

core
- cored
- cores
- coring

corporate
- corporates
- corporation
- corporations

correspond
- corresponded
- correspondence
- corresponding
- correspondingly
- corresponds

credit
- credited
- crediting
- creditor
- creditors
- credits

criteria
- criterion
- cultural
- culturally

culture
- cultured
- cultures

deduce
- deduced
- deduces
- deducing
- deduction
- deductions
- demonstrable
- demonstrably

demonstrate
- demonstrated
- demonstrates
- demonstrating
- demonstration
- demonstrations
- demonstrative
- demonstratively
- demonstrator
- demonstrators

deregister

deregistered
deregistering
deregisters
deregistration
deregulated
deregulates
deregulating
deregulation
design
designed
designer
designers
designing
designs
disproportion
disproportionate
disproportionately
distinct
distinction
distinctions
distinctive
distinctively
distinctly
document
documentation
documented
documenting
documents
dominance
dominant
dominate
dominated
dominates
dominating
domination
element
elements
emphasis
emphasize
emphasized
emphasizing
emphasize
emphasized
emphasizes
emphasizing
emphatic
emphatically
ensure
ensured
ensures
ensuring
equate

- equated
- equates
- equating
- equation
- equations

evaluate
- evaluated
- evaluates
- evaluating
- evaluation
- evaluations
- evaluative

exclude
- excluded
- excludes
- excluding
- exclusion
- exclusionary
- exclusionist
- exclusions
- exclusive
- exclusively

feature
- featured
- features
- featuring

final
- finalize
- finalized
- finalizes
- finalizing
- finality
- finalize
- finalized
- finalizes
- finalizing
- finally
- finals

focus
- focused
- focuses
- focusing
- focused
- focusing

framework
- frameworks

fund
- funded
- funder
- funders
- funding
- funds

illustrate
- illustrated
- illustrates
- illustrating
- illustration
- illustrations
- illustrative
- immigrant
- immigrants

immigrate
- immigrated
- immigrates
- immigrating
- immigration

impact
- impacted
- impacting
- impacts

imply
- implied
- implies
- implying

inappropriate
- inappropriacy
- inappropriately

inconclusive
- inconclusively
- inconstancy
- inconstantly

indistinct
- indistinctly

initial
- initially

injure
- injured
- injures
- injuries
- injuring
- injury

insecure
- insecurities
- insecurity

instance
- instances

institute
- instituted
- institutes
- instituting
- institution
- institutional
- institutionalize
- institutionalized

institutionalizes
institutionalizing
institutionalized
institutionalizes
institutionalizing
institutionally
institutions
insufficient
insufficiently
interact
interacted
interacting
interaction
interactions
interactive
interactively
interacts
invalidate
invalidity
invest
invested
investing
investment
investments
investor
investors
invests
irrelevance
irrelevant
item
itemization
itemize
itemized
itemizes
itemizing
items
journal
journals
justify
justifiable
justifiably
justification
justifications
justified
justifies
justifying
layer
layered
layering
layers
link
linkage

- linkages
- linked
- linking
- links

locate
- located
- locating
- location
- locations

maintain
- maintained
- maintaining
- maintains
- maintenance

maximize
- maximization
- maximized
- maximizes
- maximizing
- maximization
- maximize
- maximized
- maximizes
- maximizing
- maximum

minor
- minorities
- minority
- minors

negate
- negated
- negates
- negating
- negative
- negatively
- negatives

non-traditional

normal
- normalization
- normalize
- normalized
- normalizes
- normalizing
- normality
- normalization
- normalize
- normalized
- normalizes
- normalizing
- normally

obtain
- obtainable

- obtained
- obtaining
- obtains

outcome
- outcomes

participate
- participant
- participants
- participated
- participates
- participating
- participation
- participatory

partner
- partners
- partnership
- partnerships

perceive
- perceived
- perceives
- perceiving
- perception
- perceptions

philosopher
- philosophers
- philosophical
- philosophically
- philosophies
- philosophies
- philosophized
- philosophizes
- philosophizing
- philosophize
- philosophized
- philosophizes
- philosophizing
- philosophy

physical
- physically

positive
- positively

potential
- potentially

previous
- previously

primarily
- primary

proportion
- proportional
- proportionally
- proportionate
- proportionately

- proportions
- publish
  - published
  - publisher
  - publishers
  - publishes
  - publishing
- purchase
  - purchased
  - purchaser
  - purchasers
  - purchases
  - purchasing
- range
  - ranged
  - ranges
  - ranging
- react
  - reacted
  - reacting
  - reaction
  - reactionaries
  - reactionary
  - reactions
  - reactivate
  - reactivation
  - reactive
  - reactor
  - reactors
  - reacts
- reconstruct
  - reconstructed
  - reconstructing
  - reconstruction
  - reconstructs
- re-evaluate
  - re-evaluated
  - re-evaluates
  - re-evaluating
  - re-evaluation
- refocus
  - refocused
  - refocuses
  - refocusing
  - refocused
  - refocuses
  - refocusing
- region
  - regional
  - regionally
  - regions
- register

registered
registering
registers
registration
regulate
regulated
regulates
regulating
regulation
regulations
regulator
regulators
regulatory
reinvest
reinvested
reinvesting
reinvestment
reinvests
relevant
relevance
rely
reliability
reliable
reliably
reliance
reliant
relied
relies
relying
relocate
relocated
relocates
relocating
relocation
remove
removable
removal
removals
removed
removes
removing
reside
resided
residence
resident
residential
residents
resides
residing
resource
resourced
resourceful

- resources
- resourcing

restrict
- restricted
- restricting
- restriction
- restrictions
- restrictive
- restrictively
- restricts

scheme
- schemed
- schemes
- scheming
- schematic
- schematically

secure
- secured
- securely
- secures
- securing
- securities
- security

seek
- seeking
- seeks

select
- selected
- selecting
- selection
- selections
- selective
- selectively
- selector
- selectors
- selects

sequence
- sequenced
- sequences
- sequencing
- sequential
- sequentially

sex
- sexes
- sexism
- sexual
- sexuality
- sexually

shift
- shifted
- shifting
- shifts

site
    sites
specify
    specifiable
    specified
    specifies
    specifying
strategic
    strategically
    strategies
    strategist
    strategists
    strategy
sufficiency
    sufficient
    sufficiently
survey
    surveyed
    surveying
    surveys
task
    tasks
technical
    technically
    technique
technology
    techniques
    technological
    technologically
text
    texts
    textual
tradition
    traditional
    traditionalist
    traditionally
    traditions
transfer
    transferable
    transference
    transferred
    transferring
    transfers
unaffected
unassisted
unconstrained
unconventional
uncultured
under-resourced
uninjured
unjustified
unobtainable

unpublished
unregulated
unreliable
unrestricted
    unrestrictive
unspecified
valid
    validate
    validated
    validating
    validation
    validity
    validly
volume
    volumes

Sublist 3

academy
    academia
    academic
    academically
    academics
    academies
access
    accessed
    accesses
    accessibility
    accessible
    accessing
adequacy
        adequate
    adequately
adjust
    adjusted
    adjusting
    adjustment
    adjustments
    adjusts
alter
    alterable
    alteration
    alterations
    altered
    altering
    alternate
    alternating
    alters
amend
    amended
    amending
    amendment
    amendments

- amends
- annual
  - annually
- apparent
  - apparently
- approximate
  - approximated
  - approximately
  - approximates
  - approximating
  - approximation
  - approximations
- attitude
  - attitudes
- attribute
  - attributable
  - attributed
  - attributes
  - attributing
  - attribution
- aware
  - awareness
- capacities
  - capacity
- challenge
  - challenged
  - challenger
  - challengers
  - challenges
  - challenging
- civil
- clause
  - clauses
- code
  - coded
  - codes
  - coding
- commit
  - commitment
  - commitments
  - commits
  - committed
  - committing
- communicate
  - communicable
  - communicated
  - communicates
  - communicating
  - communication
  - communications
  - communicative
  - communicatively

compound
- compounded
- compounding
- compounds

concentrate
- concentrated
- concentrates
- concentrating
- concentration

confer
- conference
- conferences
- conferred
- conferring
- confers

conflict
- conflicted
- conflicting
- conflicts

consult
- consultancy
- consultant
- consultants
- consultation
- consultations
- consultative
- consulted
- consulting
- consults

contact
- contactable
- contacted
- contacting
- contacts

contrast
- contrasted
- contrasting
- contrastive
- contrasts

cycle
- cycled
- cycles
- cyclic
- cyclical
- cycling

debate
- debatable
- debated
- debates
- debating

decline
- declined

declines
declining
despite
dimension
dimensional
dimensions
discrete
discretely
discretion
discretionary
domestic
domestically
domesticate
domesticated
domesticating
domestics
draft
drafted
drafting
drafts
emerge
emerged
emergence
emergent
emerges
emerging
enable
enabled
enables
enabling
energetic
energetically
energies
energy
enforce
enforced
enforcement
enforces
enforcing
entity
entities
equivalence
equivalent
erroneous
erroneously
error
errors
ethnic
ethnicity
evolve
evolution
evolutionary

- evolutionist
- evolutionists
- evolved
- evolves
- evolving

expand
- expanded
- expanding
- expands
- expansion
- expansionism
- expansive

expose
- exposed
- exposes
- exposing
- exposure
- exposures

external
- externalization
- externalize
- externalized
- externalizes
- externalizing
- externality
- externalization
- externalize
- externalized
- externalizes
- externalizing
- externally

facilitate
- facilitated
- facilitates
- facilitating
- facilitation
- facilitator
- facilitators
- facilities
- facility

fundamental
- fundamentally

generate
- generated
- generates
- generating
- generation
- generations

goal
- goals

grant
- granted

- granting
- grants

hence

hypotheses
- hypothesis
- hypothesize
- hypothesized
- hypothesizes
- hypothesizing
- hypothesize
- hypothesized
- hypothesizes
- hypothesizing
- hypothetical
- hypothetically

illogical
- illogically

image
- imagery
- images

implement
- implementation
- implemented
- implementing
- implements

implicate
- implicated
- implicates
- implicating
- implication
- implications

impose
- imposed
- imposes
- imposing
- imposition

imprecise

inaccessible

inadequacies
- inadequacy
- inadequate
- inadequately

incapacitate
- incapacitated

indiscrete
- indiscretion

instability

integrate
- integral
  - integrated
- integrates
- integrating

integration
internal
internalize
internalized
internalizes
internalizing
internalize
internalized
internalizes
internalizing
internally
investigate
investigated
investigates
investigating
investigation
investigations
investigative
investigator
investigators
job
jobs
label
labeled
labeling
labelled
labelling
labels
liberal
liberalization
liberalize
liberalized
liberalizes
liberalizing
liberalism
liberalization
liberalize
liberalized
liberalizes
liberalizing
liberally
liberals
liberate
liberated
liberates
liberating
liberation
liberations
liberator
liberators
licence
licences

- license
- licensed
- licenses
- licensing

logic
- logical
- logically
- logician
- logicians

margin
- marginal
- marginally
- margins

mechanism
- mechanisms

medical
- medically

mental
- mentality
- mentally

modification
- modifications
- modified
- modifies
- modify
- modifying

monitor
- monitored
- monitoring
- monitors

multidimensional

network
- networked
- networking
- networks

notion
- notions

objective
- objectively
- objectivity

obvious
- obviously

occupancy
- occupant
- occupants
- occupation
- occupational
- occupations
- occupied
- occupier
- occupiers
- occupies

occupy
occupying
option
optional
options
orient
orientate
orientated
orientates
orientating
orientation
oriented
orienting
orients
output
outputs
overall
parallel
paralleled
paralleled
paralleling
parallels
parameter
parameters
perspective
perspectives
phase
phased
phases
phasing
precise
precisely
precision
predict
predictability
predictable
predictably
predicted
predicting
prediction
predictions
predicts
prime
primacy
principal
principally
prior
professional
professionalism
professionally
professionals
project

projected
projecting
projection
projections
projects
promote
promoted
promoter
promoters
promotes
promoting
promotion
promotions
psychology
psychological
psychologically
psychologist
psychologists
pursue
pursued
pursues
pursuing
pursuit
pursuits
ratio
ratios
readjust
readjusted
readjusting
readjustment
readjustments
readjusts
redraft
redrafted
redrafting
redrafts
regime
regimes
reject
rejected
rejecting
rejection
rejections
rejects
reorient
reorientation
resolve
resolution
resolved
resolves
resolving
retain

- retained
- retainer
- retainers
- retaining
- retains

retention
- retentive

revenue
- revenues

series

stabilization
- stabilize
- stabilized
- stabilizes
- stabilizing
- stability
- stabilization
- stabilize
- stabilized
- stabilizes
- stabilizing
- stable

statistic
- statistical
- statistically
- statistician
- statisticians
- statistics

status

stress
- stressed
- stresses
- stressful
- stressing

style
- styled
- styles
- styling
- stylize
- stylized
- stylizes
- stylish
- stylizing
- stylize
- stylized
- stylizes
- stylizing

subsequent
- subsequently

substitute
- substituted
- substitutes

- substituting
- substitution

summary
- summaries
- summarization
- summarizations
- summaries
- summarized
- summarizes
- summarizing
- summarization
- summarizations
- summarize
- summarized
- summarizes
- summarizing

sum
- summation
- summed
- summing
- sums

sustain
- sustainability
- sustainable
- sustained
- sustaining
- sustains
- sustenance

symbol
- symbolic
- symbolically
- symbolize
- symbolized
- symbolizes
- symbolizing
- symbolism
- symbolize
- symbolized
- symbolizes
- symbolizing
- symbols

target
- targeted
- targeting
- targets

transit
- transited
- transiting
- transition
- transitional
- transitions
- transitory

transits
trend
trends
unalterable
unaltered
unaware
undertake
undertaken
undertakes
undertaking
undertook
unlicensed
unmodified
unmonitored
unparalleled
unpredictability
unpredictable
unresolved
unstable
unstressed
unsustainable
version
versions
welfare
whereas

Sublist 4

abstract
abstraction
abstractions
abstractly
abstracts
accuracy
accurate
accurately
acknowledge
acknowledged
acknowledgements
acknowledgement
acknowledges
acknowledging
adapt
adaptability
adaptable
adaptation
adaptations
adapted
adapting
adaptive
adapts
adult
adulthood

adults
advocacy
advocate
advocated
advocates
advocating
aggregate
aggregated
aggregates
aggregating
aggregation
aid
aided
aiding
aids
allocate
allocated
allocates
allocating
allocation
allocations
assign
assigned
assigning
assignment
assignments
assigns
attach
attached
attaches
attaching
attachment
attachments
author
authored
authoring
authors
authorship
bond
bonded
bonding
bonds
brevity
brief
briefed
briefing
briefly
briefs
capabilities
capability
capable
channel

- channeled
- channeling
- channels

chemical
- chemically
- chemicals

citation
- citations
- cite
- cited
- cites
- citing

classic
- classical
- classics

comprehensive
- comprehensively

comprise
- comprised
- comprises
- comprising

confirm
- confirmation
- confirmed
- confirming
- confirms

contrary
- contrarily

convert
- conversion
- conversions
- converted
- convertible
- converting
- converts

cooperate
- co-operate
- cooperated
- co-operated
- cooperates
- co-operates
- cooperating
- cooperation
- co-operation
- cooperative
- co-operative
- cooperatively
- co-operatively

couple
- coupled
- couples
- coupling

decade
    decades
definite
    definitely
    definitive
deniable
    denial
    denials
    denied
    denies
    deny
    denying
differentiate
    differentiated
    differentiates
    differentiating
    differentiation
discriminate
    discriminated
    discriminates
    discriminating
    discrimination
display
    displayed
    displaying
    displays
dispose
    disposable
    disposal
    disposed
    disposes
    disposing
diverse
    diversely
    diversification
    diversified
    diversifies
    diversify
    diversifying
    diversity
domain
    domains
dynamic
    dynamically
    dynamics
edit
    edited
    editing
    edition
    editions
    editor
    editorial

editorials
editors
edits
eliminate
eliminated
eliminates
eliminating
elimination
empirical
empirically
empiricism
enhance
enhanced
enhancement
enhances
enhancing
equip
equipment
equipped
equipping
equips
estate
estates
exceed
exceeded
exceeding
exceeds
expert
expertise
expertly
experts
explicit
explicitly
extract
extracted
extracting
extraction
extracts
federal
federation
federations
fee
fees
file
filed
files
filing
finite
flexibility
flexible
foundation
foundations

furthermore
gender
    genders
global
    globalization
    globally
    globe
grade
    graded
    grades
    grading
guarantee
    guaranteed
    guaranteeing
    guarantees
hierarchy
    hierarchical
    hierarchies
identical
    identically
ideology
    ideological
    ideologically
    ideologies
ignorance
    ignorant
    ignore
    ignored
    ignores
    ignoring
inaccuracies
    inaccuracy
    inaccurate
incapable
incentive
    incentives
incidence
    incident
    incidentally
    incidents
incorporate
    incorporated
    incorporates
    incorporating
    incorporation
indefinite
    indefinitely
index
    indexed
    indexes
    indexing
infer

- inference
- inferences
- inferred
- inferring
- infers

infinite
- infinitely

inflexibility
- inflexible

inhibit
- inhibited
- inhibiting
- inhibition
- inhibitions
- inhibits

initiate
- initiated
- initiates
- initiating
- initiation
- initiations
- initiative
- initiatives
- initiator
- initiators

innovate
- innovated
- innovates
- innovating
- innovation
- innovations
- innovative
- innovator
- innovators

input
- inputs

insert
- inserted
- inserting
- insertion
- inserts

instruct
- instructed
- instructing
- instruction
- instructions
- instructive
- instructor
- instructors
- instructs

intelligence
- intelligent

- intelligently
- interval
  - intervals
- intervene
  - intervened
  - intervenes
  - intervening
  - intervention
  - interventions
- invisibility
  - invisible
- irrational
- irreversible
- isolate
  - isolated
  - isolates
  - isolating
  - isolation
  - isolationism
- lecture
  - lectured
  - lecturer
  - lecturers
  - lectures
  - lecturing
- media
- migrant
  - migrants
  - migrate
  - migrated
  - migrates
  - migrating
  - migration
  - migrations
  - migratory
- minimum
  - ministered
  - ministerial
  - ministering
  - ministries
- ministry
- mode
  - modes
- motivate
  - motivated
  - motivates
  - motivating
  - motivation
  - motivations
  - motive
  - motives
- neutral

- neutralization
- neutralize
- neutralized
- neutralizes
- neutralizing
- neutrality
- neutralization
- neutralize
- neutralized
- neutralizes
- neutralizing

nevertheless

overseas

paradigm
- paradigms

phenomena
- phenomenal
- phenomenon

precede
- preceded
- precedence
- precedent
- precedes
- preceding

presume
- presumably
- presumed
- presumes
- presuming
- presumption
- presumptions
- presumptuous

priority
- priorities
- prioritization
- priorities
- prioritized
- prioritizes
- prioritizing
- prioritization
- prioritize
- prioritized
- prioritizes
- prioritizing

prohibit
- prohibited
- prohibiting
- prohibition
- prohibitions
- prohibitive
- prohibits

publication

- publications
- quote
  - quotation
  - quotations
  - quoted
  - quotes
  - quoting
- rational
  - rationalization
  - rationalizations
  - rationalize
  - rationalized
  - rationalizes
  - rationalizing
  - rationalism
  - rationality
  - rationalization
  - rationalizations
  - rationalize
  - rationalized
  - rationalizes
  - rationally
- reassign
  - reassigned
  - reassigning
  - reassigns
- recover
  - recoverable
  - recovered
  - recovering
  - recovers
  - recovery
- release
  - released
  - releases
  - releasing
- reveal
  - revealed
  - revealing
  - reveals
  - revelation
  - revelations
  - reversal
  - reversals
- reverse
  - reversed
  - reverses
  - reversible
  - reversing
- scope
- simulate
  - simulated

- simulates
- simulating
- simulation

sole
- solely

somewhat

submit
- submission
- submissions
- submits
- submitted
- submitting

subsidiary
- subsidies
- subsidized
- subsidizes
- subsidizing
- subsidize
- subsidized
- subsidizes
- subsidizing
- subsidy

succession
- successions
- successive
- successively
- successor
- successors

survive
- survival
- survived
- survives
- surviving
- survivor
- survivors

tape
- taped
- tapes
- taping

thesis
- theses

topic
- topical
- topics

trace
- traceable
- traced
- traces
- tracing

transform
- transformation
- transformations

transformed
transforming
transforms
transmit
transmission
transmissions
transmits
transmitted
transmitting
transport
transportation
transported
transporter
transporters
transporting
transports
ultimate
ultimately
unaided
unassigned
unattached
undeniable
underlay
underlie
underlies
underlying
unintelligent
unique
uniquely
uniqueness
unmotivated
unprecedented
utilization
utilize
utilized
utilizer
utilizers
utilizes
utilizing
utilities
utility
utilization
utilize
utilized
utilizes
utilizing
visible
visibility
visibly
voluntary
voluntarily
volunteer

volunteered
volunteering
volunteers

Sublist 5

accommodate
accommodated
accommodates
accommodating
accommodation
adjacent
albeit
analogy
analogies
analogous
anticipate
anticipated
anticipates
anticipating
anticipation
assemble
assembled
assembles
assemblies
assembling
assembly
assurance
assurances
assure
assured
assuredly
assures
assuring
attain
attainable
attained
attaining
attainment
attainments
attains
behalf
bulk
bulky
cease
ceased
ceaseless
ceases
ceasing
coherence
coherent
coherently
coincide

- coincided
- coincidence
- coincidences
- coincident
- coincidental
- coincides
- coinciding

collapse
- collapsed
- collapses
- collapsible
- collapsing

colleague
- colleagues

commence
- commenced
- commencement
- commences
- commencing

compatibility
- compatible

compile
- compilation
- compilations
- compiled
- compiles
- compiling

conceive
- conceivable
- conceivably
- conceived
- conceives
- conceiving

concurrent
- concurrently

confine
- confined
- confines
- confining

controversy
- controversial
- controversially
- controversies

converse
- conversely

convince
- convinced
- convinces
- convincing
- convincingly

depress
- depressed

depresses
depressing
depression
device
devices
devote
devoted
devotedly
devotes
devoting
devotion
devotions
diminish
diminished
diminishes
diminishing
diminution
distort
distorted
distorting
distortion
distortions
distorts
duration
encounter
encountered
encountering
encounters
enormity
enormous
enormously
erode
eroded
erodes
eroding
erosion
ethic
ethical
ethically
ethics
format
formats
formatted
formatting
forthcoming
found
founded
founder
founders
founding
immature
immaturity

incline
- inclination
- inclinations
- inclined
- inclines
- inclining
- incoherent
- incoherently
- incompatibility
- incompatible
- inconceivable
- inconceivably

inherent
- inherently

insight
- insightful
- insights

integral
- integrity

intermediate
intrinsic
- intrinsically

invoke
- invoked
- invokes
- invoking

levy
- levies

likewise
manual
- manually
- manuals

mature
- maturation
- maturational
- matured
- matures
- maturing
- maturity

mediate
- mediated
- mediates
- mediating
- mediation

medium
military
minimal
- minimalization
- minimalize
- minimalized
- minimalizes
- minimalizing

minimalist
minimalistic
minimalists
minimalization
minimalize
minimalized
minimalizes
minimalizing
minimally
mutual
mutually
nonetheless
norm
norms
notwithstanding
odd
odds
ongoing
overlap
overlapped
overlapping
overlaps
panel
paneled
paneling
panels
passive
passively
passivity
persist
persisted
persistence
persistent
persistently
persisting
persists
portion
portions
pose
posed
poses
posing
preliminary
preliminaries
protocol
protocols
qualitative
qualitatively
recommence
recommenced
recommences
recommencing

refine
    refined
    refinement
    refinements
    refines
    refining
relax
    relaxation
    relaxed
    relaxes
    relaxing
reluctance
    reluctant
    reluctantly
restrain
    restrained
    restraining
    restrains
    restraint
    restraints
revolution
    revolutionaries
    revolutionary
    revolutionize
    revolutionized
    revolutionizes
    revolutionizing
    revolutionist
    revolutionists
    revolutionize
    revolutionized
    revolutionizes
    revolutionizing
    revolutions
rigid
    rigidities
    rigidity
    rigidly
route
    routed
    routes
    routing
scenario
    scenarios
so-called
sphere
    spheres
    spherical
    spherically
straightforward
subordinate
    subordinates

subordination
supplement
supplementary
supplemented
supplementing
supplements
suspend
suspended
suspending
suspends
suspension
team
teamed
teaming
teams
temporary
temporarily
trigger
triggered
triggering
triggers
unanticipated
unattainable
unconfined
uncontroversial
unconvinced
undergo
undergoes
undergoing
undergone
underwent
undiminished
unethical
unfounded
unify
unification
unified
unifies
unifying
unrestrained
violate
violated
violates
violating
violation
violations
vision
visions
whereby

Sublist 6
abandon

- abandoned
- abandoning
- abandonment
- abandons

accompany
- accompanied
- accompanies
- accompaniment
- accompanying
- unaccompanied

accumulate
- accumulated
- accumulating
- accumulation
- accumulates

ambiguous
- ambiguities
- ambiguity
- unambiguous
- unambiguously

append
- appendix
- appended
- appends
- appending
- appendices
- appendixes

appreciate
- appreciable
- appreciably
- appreciated
- appreciates
- appreciating
- appreciation
- unappreciated

arbitrary
- arbitrariness
- arbitrarily

automate
- automatic
- automated
- automates
- automating
- automatically
- automation

bias
- biased
- biases
- biasing
- unbiased

chart
- charted

- charting
- charts
- uncharted

clarify
- clarification
- clarified
- clarifies
- clarifying
- clarity

commodity
- commodities

complement
- complementary
- complemented
- complementing
- complements

conform
- conformable
- conformability
- conformance
- conformation
- conformed
- conforming
- conformist
- conformists
- conformity
- conforms
- nonconformist
- nonconformists
- nonconformity
- non-conformist
- non-conformists
- non-conformity

contemporary
- contemporaries

contradict
- contradicted
- contradicting
- contradiction
- contradictions
- contradictory
- contradicts

crucial
- crucially

currency
- currencies

denote
- denotation
- denotations
- denoted
- denotes
- denoting

detect
- detectable
- detected
- detecting
- detection
- detective
- detectives
- detector
- detectors
- detects

deviate
- deviated
- deviates
- deviating
- deviation
- deviations

displace
- displaced
- displacement
- displaces
- displacing

drama
- dramas
- dramatic
- dramatically
- dramatize
- dramatized
- dramatizing
- dramatizes
- dramatization
- dramatizations
- dramatist
- dramatists
- dramatization
- dramatizations
- dramatize
- dramatized
- dramatizes
- dramatizing

eventual
- eventuality
- eventually

exhibit
- exhibited
- exhibiting
- exhibition
- exhibitions
- exhibits

exploit
- exploitation
- exploited
- exploiting

- exploits

fluctuate
- fluctuated
- fluctuates
- fluctuating
- fluctuation
- fluctuations

guideline
- guidelines

highlight
- highlighted
- highlighting
- highlights

implicit
- implicitly

induce
- induced
- induces
- inducing
- induction

inevitable
- inevitability
- inevitably

infrastructure
- infrastructures

inspect
- inspected
- inspecting
- inspection
- inspections
- inspector
- inspectors
- inspects

intense
- intensely
- intenseness
- intensification
- intensified
- intensifies
- intensify
- intensifying
- intension
- intensity
- intensive
- intensively

manipulate
- manipulated
- manipulates
- manipulating
- manipulation
- manipulations
- manipulative

minimize
    minimized
    minimizes
    minimizing
    minimize
    minimized
    minimizes
    minimizing
nuclear
offset
    offsets
    offsetting
paragraph
    paragraphing
    paragraphs
plus
    pluses
practitioner
    practitioners
predominant
    predominance
    predominantly
    predominate
    predominated
    predominates
    predominating
prospect
    prospective
    prospects
radical
    radically
    radicals
random
    randomly
    randomness
reinforce
    reinforced
    reinforcement
    reinforcements
    reinforces
    reinforcing
restore
    restoration
    restored
    restores
    restoring
revise
    revised
    revises
    revising
    revision
    revisions

schedule
    reschedule
    rescheduled
    reschedules
    rescheduling
    scheduled
    schedules
    scheduling
    unscheduled
tense
    tension
    tensely
    tenser
    tensest
    tensions
terminate
    terminal
    terminals
    terminated
    terminates
    terminating
    termination
    terminations
theme
    themes
    thematic
    thematically
thereby
uniform
    uniformity
    uniformly
vehicle
    vehicles
via
virtual
    virtually
visual
    visualize
    visualized
    visualizing
    visualization
    visualize
    visualized
    visualizing
    visualization
    visually
widespread

Glossary

Abbreviation – the short form of a word or phrase

Abstract – a short summary of the aims and scope of a journal article

Acknowledgements – a list of people the author wishes to thank for their assistance, found in books and articles

Appendix (pl. – **appendices) –** a section at the end of a book or article contain supplementary information

Assignment – a task given to students, normally for assessment

Authority – a well-known expert on a subject

Back issue – a previous issue of a journal or magazine

Bias – a subjective preference for one point of view

Bibliography – a list of sources an author has read but not specifically cited

Brainstorm – a process of collecting ideas on a topic at random

Case study – a section of an essay that examines one example in detail

Citation – an in-text reference providing a link to the source

Cohesion – linking ideas in a text together by use of reference words

Coursework – assessed assignments given to students to complete during a course

Conclusion – the final section of an essay or report

Contraction – a shortened form of pronoun and verb (e.g. she's, I'd)

Criteria (sing. – **criterion) –** the principles on which something is judged or based

Deadline – the final date for completing a piece of work

Draft – the first attempt at a piece of writing

Edited book – a book with contributions from a number of writers, controlled by an editor

Extract – a piece of text taken from a longer work

Flow chart – diagram that illustrates the stages of a process

Formality – in written work, the use of a non-idiomatic style and vocabulary

Format – the standard pattern of layout for a text

Heading – the title of a section of text

Higher degree – a Master's degree or Doctorate

Hypothesis – a theory that a researcher is attempting to explore/test

Introduction – the first part of an essay or article

Journal – an academic publication in a specialized area, usually published quarterly

Literature review – a section of an article describing other research on the topic in question

Main body – the principal part of an essay, after the introduction and before the conclusion

Margin – the strip of white space on a page around the text

Module – most academic courses are divided into modules, which examine a specified topic

Outline – a preparatory plan for a piece of writing

Paraphrase – a rewriting of a text with substantially different wording and organization but similar ideas

Peer review – the process of collecting comment from academic authorities on an article before publication in a journal. This system gives increased validity to the publication

Phrase – a few words that are commonly combined

Plagiarism – using another writer's work without acknowledgement in an acceptable manner

Primary research – original research (e.g. a laboratory experiment or a sociological enquiry)

Quotation – use of the exact words of another writer to illustrate your writing

Redundancy – the unnecessary repetition of ideas or information

References – a list of all the sources you have cited in your work

Register – the level of formality in language

Restatement – repeating a point in order to explain it more clearly

Scan – a method of reading in which the eyes move quickly over the page to find a specific item

Skim – a related reading technique to quickly find out the main ideas of a text

Source – the original text you have used to obtain an idea or piece of information

Summary – a shorter version of something

Synonym – a word or phrase with a similar meaning to another

Synopsis – a summary of an article o–r book

Term – word or phrase used to express a special concept

Word class – a grammatical category (e.g. noun, adjective)

Учебное издание

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