TST PREP

TOEFL SOLUTIONS *for* OPEN MINDS

Complete TOEFL Test #11

THE READING SECTION

2019 - 2020

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for OPEN MINDS

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The Reading Section

The TOEFL Reading Section:
Directions

This section measures your ability to understand academic passages in English.

There are three passages in this section. You have 54 minutes to complete the entire section. You may read the passages, and answer the questions in any order you choose, but plan to spend about 18 minutes on each passage and the accompanying questions.

Most questions are worth one point, but the last question for each passage is worth more than one point. The directions for the last question indicate how many points you may receive.

At the end of this practice test you will find an answer key, information to help determine your score, and explanations of the answers.

Turn the page to begin the reading section.

The Importance of Seed Plants

Seed plants are the foundation of human diets across the world. Many societies eat almost exclusively vegetarian fare and depend solely on seed plants for their nutritional needs. A few crops (rice, wheat, and potatoes) dominate the agricultural landscape. Many crops were developed during the agricultural revolution when human societies made the transition from nomadic hunter-gatherers to horticulture and agriculture. Cereals, rich in carbohydrates, provide the staple of many human diets. Beans and nuts supply proteins. Fats are derived from crushed seeds, as is the case for peanut and rapeseed (canola) oils or fruits such as olives. Livestock, like cows and sheep, also consume large amounts of crops.

Staple crops are not the only food derived from seed plants. Fruits and vegetables provide nutrients, vitamins, and fiber. Sugar, to sweeten dishes, is produced from the monocot sugarcane and the eudicot sugar beet. Drinks are made from infusions of tea leaves, chamomile flowers, crushed coffee beans, or powdered cocoa beans. Spices come from many different plant parts: saffron and cloves are stamens and buds, black pepper and vanilla are seeds, the bark of a bush in the Laurales family -- shrubs and plants with dark green glossy leaves -- supplies cinnamon, and the herbs that flavor many dishes come from dried leaves and fruit, such as the red chili pepper. Additionally, no discussion of seed plant contribution to human diet would be complete without the mention of alcohol. Fermentation of plant-derived sugars and starches is used to produce alcoholic beverages in all societies. In some cases, the beverages are derived from the fermentation of sugars from fruit, as with wines and, in other cases, from the fermentation of carbohydrates derived from seeds, as with beers.

Seed plants have many other uses, including providing wood as a source of timber for construction, fuel, and material to build furniture. Most paper is derived from the pulp of coniferous trees. Fibers of seed plants such as cotton, flax, and hemp are woven into cloth. Textile dyes, such as indigo, were mostly of plant origin until the advent of synthetic chemical dyes. The medicinal properties of plants have been known to human societies since ancient times. There are references to the use of plants' curative properties in Egyptian, Babylonian, and Chinese writings from 5,000 years ago.

Biodiversity ensures a resource for new food crops and medicines. Plant life balances ecosystems, protects watersheds, mitigates erosion, moderates climate and provides shelter for many animal species. Threats to plant diversity, however, come from many angles. The explosion of the human population, especially in tropical countries where birth rates are highest and economic development is in full swing, is leading to human encroachment into forested areas. To feed the larger population, humans need to obtain arable land, so there is a massive clearing of trees. The need for more energy to power larger cities and economic growth therein leads to the construction of dams, the consequent flooding of ecosystems, and increased emissions of pollutants.

The number of plant species becoming extinct is increasing at an alarming rate. Because ecosystems are in a delicate balance, and seed plants maintain close symbiotic relationships with animals, the disappearance of a single plant can lead to the extinction of connected animal species. A real and pressing issue is that many plant species have not yet been cataloged, and so their place in the ecosystem is unknown. These unknown species are threatened by logging, habitat destruction, and loss of pollinators. They may become extinct before we have the chance to begin to understand the possible impacts from their disappearance. Efforts to preserve biodiversity take several lines of action, from preserving heirloom seeds to barcoding species. Heirloom seeds come from plants that were traditionally grown in human populations, as opposed to the seeds used for large-scale agricultural production. Barcoding is a technique in which one or more short gene sequences, taken from a well-characterized portion of the genome, are used to identify a species through DNA analysis.

Reading Paragraph 1

Seed plants are the foundation of human diets across the world. Many societies eat almost exclusively vegetarian fare and depend solely on seed plants for their nutritional needs. A few crops (rice, wheat, and potatoes) dominate the agricultural landscape. Many crops were developed during the agricultural revolution when human societies made the transition from nomadic hunter-gatherers to horticulture and agriculture. Cereals, rich in carbohydrates, provide the staple of many human diets. Beans and nuts supply proteins. Fats are derived from crushed seeds, as is the case for peanut and rapeseed (canola) oils or fruits such as olives. Livestock, like cows and sheep, also consume large amounts of crops.

1. According to paragraph 1, which of the following is true?

- **a.** Most societies have vegetarian diets and do not consume meat or fish
- **b.** Humans started farming after relying on hunting and gathering
- **c.** Nuts and beans make up an essential part of the human diet
- **d.** Humans get protein from foods like oil and olives

Reading Paragraph 2

Staple crops are not the only food derived from seed plants. Fruits and vegetables provide nutrients, vitamins, and fiber. Sugar, to sweeten dishes, is produced from the monocot sugarcane and the eudicot sugar beet. Drinks are made from infusions of tea leaves, chamomile flowers, crushed coffee beans, or powdered cocoa beans. Spices come from many different plant parts: saffron and cloves are stamens and buds, black pepper and vanilla are seeds, the bark of a bush in the Laurales family -- shrubs and plants with dark green glossy leaves -- supplies cinnamon, and the herbs that flavor many dishes come from dried leaves and fruit, such as the red chili pepper. Additionally, no discussion of seed plant contribution to human diet would be complete without the mention of alcohol. Fermentation of plant-derived sugars and starches is used to produce alcoholic beverages in all societies. In some cases, the beverages are derived from the fermentation of sugars from fruit, as with wines and, in other cases, from the fermentation of carbohydrates derived from seeds, as with beers.

2. The phrase derived from in paragraph 2 is closest in meaning to

- **a.** Given to
- **b.** Prepared for
- **c.** Obtained from
- **d.** Moved from

3. What does the author say about spices?

- **a.** They are made by infusions of crushed beans, leaves, and flowers
- **b.** They all come from seeds that are ground down
- **c.** The majority are from dried leaves and fruit
- **d.** They are sourced from a variety of parts of the plant

4. The author mentions all of the following about alcohol EXCEPT

- **a.** Alcohol is made by the fermentation of sugars and starches from plants
- **b.** Some alcoholic beverages are made with the sugars from fruit
- **c.** Wines are made with fermented fruit sugars
- **d.** Most alcohol is made by fermenting carbohydrates from seeds

Reading Paragraph 4

Biodiversity ensures a resource for new food crops and medicines. Plant life balances ecosystems, protects watersheds, mitigates erosion, moderates climate and provides shelter for many animal species. Threats to plant diversity, however, come from many angles. The explosion of the human population, especially in tropical countries where birth rates are highest and economic development is in full swing, is leading to human encroachment into forested areas. To feed the larger population, humans need to obtain arable land, so there is a massive clearing of trees. The need for more energy to power larger cities and economic growth therein leads to the construction of dams, the consequent flooding of ecosystems, and increased emissions of pollutants.

5. According to paragraph 4, how does plant life positively affect the environment?

- **a.** Creates watersheds and controls erosion rates
- **b.** Creates biodiversity for new food crops and medicines
- **c.** Provides shelter for and feeds the majority of animal species
- **d.** Stabilizes ecosystems and moderates the climate

6. Which of the following best expresses the essential information in the highlighted sentence in paragraph 4? Incorrect choices change the meaning in important ways or leave out essential information.

- **a.** Tropical countries have higher birth rates and faster economic growth
- **b.** Birth rates are highest in developing countries when compared to other nations
- **c.** More people move into areas that were once reserved for forests as the population grows
- **d.** Tropical countries specifically are taking over forest lands

Reading Paragraph 5

The number of plant species becoming extinct is increasing at an alarming rate. Because ecosystems are in a delicate balance, and seed plants maintain close symbiotic relationships with animals, the disappearance of a single plant can lead to the extinction of connected animal species. A real and pressing issue is that many plant species have not yet been cataloged, and so their place in the ecosystem is unknown. These unknown species are threatened by logging, habitat destruction, and loss of pollinators. They may become extinct before we have the chance to begin to understand the possible impacts from their disappearance. Efforts to preserve biodiversity take several lines of action, from preserving heirloom seeds to barcoding species. Heirloom seeds come from plants that were traditionally grown in human populations, as opposed to the seeds used for large-scale agricultural production. Barcoding is a technique in which one or more short gene sequences, taken from a well-characterized portion of the genome, are used to identify a species through DNA analysis.

7. Why does the author talk about "unknown species"?

- **a.** To show that researchers have identified almost all known species
- **b.** To emphasize that humans do not fully grasp the impact of their use of plants
- **c.** To suggest that the planet might be more biodiverse than we know
- **d.** To imply that we need more biologists studying plant life

8. According to paragraph 5, how do we identify and catalog organisms?

- **a.** Through barcoding and subsequent DNA analysis
- **b.** By preserving heirloom seeds
- **c.** Via a process of barcoding and hi-tech photographs
- **d.** Through advanced DNA analysis

9. Look at the four squares (A, B, C, D) that indicate where the following sentence could be added to the passage.

Their use in medicine has only increased as the human population and subsequent demand has grown significantly, and this is putting a strain on the environment and affecting biodiversity.

Where would the sentence best fit?

Fibers of seed plants such as cotton, flax, and hemp are woven into cloth. A Textile dyes, such as indigo, were mostly of plant origin until the advent of synthetic chemical dyes. B The medicinal properties of plants have been known to human societies since ancient times. C There are references to the use of plants' curative properties in Egyptian, Babylonian, and Chinese writings from 5,000 years ago. D

10. DIRECTIONS: An introductory sentence for a brief summary of the passage is provided below. Complete the summary by selecting the THREE answer choices that express the most important ideas in the passage. Some sentences do not belong in the summary because they express ideas that are not presented in the passage or are minor ideas in the passage. <u>This question is worth 2 points</u>.

Seed plants have been essential to human survival, however, their continued overuse by a growing population has catastrophic effects for the planet.

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a. Unidentified species are put through a process where some pieces of DNA from their genome are analyzed
b. Seed plants have been used for food, alcohol, and medicine
c. Ecosystems and animal populations are negatively affected by plant overconsumption
d. The increased construction of dams causes flooding and greater pollutants emission
e. The use of plants for their medicinal properties is documented as far back as 5,000 years ago
f. Forested areas are being destroyed for human development as the human population and economies grow

Telescopes

Most popular depictions in TV shows and movies portray an astronomer as someone who spends most nights in a cold observatory looking through a telescope, but this is not very accurate today. Most astronomers do not live at observatories, but near the universities or laboratories where they work. An astronomer might spend only a week or so each year observing at the telescope and the rest of the time measuring or analyzing the data acquired from large projects or surveys. Many astronomers use radio telescopes for space experiments, which work just as well during the daylight hours. Still others work at purely theoretical problems using supercomputers and never observe at a telescope of any kind.

Even when astronomers are observing with large telescopes, they rarely peer through them. Electronic detectors permanently record the data for detailed analysis later. At some observatories, observations may be made remotely, with the astronomer sitting at a computer thousands of miles away from the telescope.

Telescopes used by modern-day astronomers are large and sophisticated machines that sometimes cost up to $100 million to build. That kind of investment demands that the telescope be placed in the best possible site. Earth's atmosphere, so vital to life, presents challenges for the observational astronomer, so there are a few conditions that astronomers look for when picking a site for an observatory.

The most obvious limitation is weather conditions such as clouds, wind, and rain. At the best sites, where most telescopes are located, the weather is clear as much as 75% of the time. Still, even on a clear night, the atmosphere filters out a certain amount of starlight. Astronomers therefore prefer dry sites with little water vapor, which is generally found at higher altitudes. The sky above the telescope should be dark. Near cities, the air scatters the glare from lights, producing an illumination that hides the faintest stars and limits the distances that can be probed by telescopes. Observatories are best located at least 100 miles from the nearest large city. The best observatory sites are therefore high, dark, and dry. The world's largest telescopes are found in such remote mountain locations as the Andes Mountains of Chile, the desert peaks of Arizona, and Mauna Kea in Hawaii, a dormant volcano.

In addition to gathering as much light as they can, astronomers also want to have the sharpest images possible. Resolution refers to the precision of detail present in an image: that is, the smallest features that can be distinguished. Astronomers are always eager to make out more detail in the images they study, whether they are following the weather on Jupiter or trying to peer into a galaxy that recently ate its neighbor for lunch. One factor that determines how good the resolution will be is the size of the telescope. Larger apertures produce sharper images. Until very recently, however, telescopes on Earth's surface could not produce images as sharp as the theory of light said they should.

The problem is our planet's atmosphere. It contains many small pockets of cell gas that range in size from inches to several feet. Each cell has a slightly different temperature from its neighbor, and each cell acts like a lens, bending (refracting) the path of the light by a small amount. This bending slightly changes the position where each light ray finally reaches the telescope. The cells of air are in motion, constantly being

blown through the light path of the telescope by winds, often in different directions at different altitudes. As a result, the path followed by the light is constantly changing.

Astronomers have devised a technique called adaptive optics that can beat Earth's atmosphere at its own game of blurring. This technique makes use of a small flexible mirror placed in the beam of a telescope. A sensor measures how much the atmosphere has distorted the image, and as often as 500 times per second, it sends instructions to the flexible mirror on how to change shape in order to compensate for distortions produced by the atmosphere. The light is thus brought back to an almost perfectly sharp focus.

Reading Paragraph 1

Most popular depictions in TV shows and movies portray an astronomer as someone who spends most nights in a cold observatory looking through a telescope, but this is not very accurate today. Most astronomers do not live at observatories, but near the universities or laboratories where they work. An astronomer might spend only a week or so each year observing at the telescope and the rest of the time measuring or analyzing the data acquired from large projects or surveys. Many astronomers use radio telescopes for space experiments, which work just as well during the daylight hours. Still others work at purely theoretical problems using supercomputers and never observe at a telescope of any kind.

1. What does the author say about astronomers in the first paragraph?

- **a.** Most of their time is spent making observations through telescopes
- **b.** Those who work on theoretical problems never use telescopes
- **c.** Most live at observatories in order to look through telescopes at night
- **d.** Many do not have time to measure and analyze data on their space experiments

Reading Paragraph 3

Telescopes used by modern-day astronomers are large and sophisticated machines that sometimes cost up to $100 million to build. That kind of investment demands that the telescope be placed in the best possible site. Earth's atmosphere, so vital to life, presents challenges for the observational astronomer, so there are a few conditions that astronomers look for when picking a site for an observatory.

2. In the third paragraph, what does the author point out about telescopes?

- **a.** That they are usually invested in by universities and labs
- **b.** That they are always $100 million to build
- **c.** That most are very high-tech and economical
- **d.** That they need to be placed in a supreme location

3. Which of the following best expresses the essential information in the highlighted sentence in paragraph 3? Incorrect choices change the meaning in important ways or leave out essential information.

- **a.** The atmosphere creates challenges for astronomers to find a site for observatories on Earth
- **b.** Earth's atmosphere has conditions that astronomers must analyze before viewing space through a telescope
- **c.** Astronomers have factors to consider when choosing an observatory's site because of the Earth's atmosphere
- **d.** Observational astronomers look at weather conditions when they pick the site for an observatory

Reading Paragraph 4

The most obvious limitation is weather conditions such as clouds, wind, and rain. At the best sites, where most telescopes are located, the weather is clear as much as 75% of the time. Still, even on a clear night, the atmosphere filters out a certain amount of starlight. Astronomers therefore prefer dry sites with little water vapor, which is generally found at higher altitudes. The sky above the telescope should be dark. Near cities, the air scatters the glare from lights, producing an illumination that hides the faintest stars and limits the distances that can be probed by telescopes. Observatories are best located at least 100 miles from the nearest large city. The best observatory sites are therefore high, dark, and dry. The world's largest telescopes are found in such remote mountain locations as the Andes Mountains of Chile, the desert peaks of Arizona, and Mauna Kea in Hawaii, a dormant volcano.

4. Which of the following is NOT mentioned in paragraph 4?

- **a.** There are large telescopes in Arizona and Hawaii
- **b.** The atmosphere separates out some starlight in telescopes
- **c.** Telescopes are best located where the weather is clear the majority of the time
- **d.** The worse place for telescopes is in tropical climates near the ocean

Reading Paragraph 5

In addition to gathering as much light as they can, astronomers also want to have the sharpest images possible. Resolution refers to the precision of detail present in an image: that is, the smallest features that can be distinguished. Astronomers are always eager to make out more detail in the images they study, whether they are following the weather on Jupiter or trying to peer into a galaxy that recently ate its neighbor for lunch. One factor that determines how good the resolution will be is the size of the telescope. Larger apertures produce sharper images. Until very recently, however, telescopes on Earth's surface could not produce images as sharp as the theory of light said they should.

5. Why does the author mention, "a galaxy that recently ate its neighbor for lunch" in paragraph 5?

- **a.** To explain how much detail high-quality resolutions can show
- **b.** To illustrate an exciting observation using a metaphor
- **c.** To provide a comprehensive list of the different uses of the telescope by astronomers
- **d.** To show why a previously existing galaxy is no more

Reading Paragraph 5

In addition to gathering as much light as they can, astronomers also want to have the sharpest images possible. Resolution refers to the precision of detail present in an image: that is, the smallest features that can be distinguished. Astronomers are always eager to make out more detail in the images they study, whether they are following the weather on Jupiter or trying to peer into a galaxy that recently ate its neighbor for lunch. One factor that determines how good the resolution will be is the size of the telescope. Larger apertures produce sharper images. Until very recently, however, telescopes on Earth's surface could not produce images as sharp as the theory of light said they should.

6. According to paragraph 5, what does the author say about resolution?

- **a.** It can only show the small details in an image when it is up close
- **b.** It cannot create sharp images if there is too much light
- **c.** It does not work on telescopes on the Earth's surface
- **d.** It is sharper on telescopes with bigger openings

Reading Paragraph 6

The problem is our planet's atmosphere. It contains many small pockets of cell gas that range in size from inches to several feet. Each cell has a slightly different temperature from its neighbor, and each cell acts like a lens, bending (refracting) the path of the light by a small amount. This bending slightly changes the position where each light ray finally reaches the telescope. The cells of air are in motion, constantly being blown through the light path of the telescope by winds, often in different directions at different altitudes. As a result, the path followed by the light is constantly changing.

7. In paragraph 6, the author says as a result in order to

- **a.** To provide the cause for why the light path is constantly changing
- **b.** To define the reason the wind blows the light paths in different directions
- **c.** To explain the effect from the cells of air constantly being blown by the winds through light paths
- **d.** To describe one problem with the Earth's atmosphere

Reading Paragraph 7

Astronomers have devised a technique called adaptive optics that can beat Earth's atmosphere at its own game of blurring. This technique makes use of a small flexible mirror placed in the beam of a telescope. A sensor measures how much the atmosphere has distorted the image, and as often as 500 times per second, it sends instructions to the flexible mirror on how to change shape in order to compensate for distortions produced by the atmosphere. The light is thus brought back to an almost perfectly sharp focus.

8. In paragraph 7, the word distorted is closest in meaning to

- **a.** Ruined
- **b.** Corrected
- **c.** Diluted
- **d.** Altered

9. Look at the four squares (A, B, C, D) that indicate where the following sentence could be added to the passage.

The Extremely Large Telescope, which will be five times larger than the world's largest telescope, is currently under construction in the driest desert in the world, Atacama Desert in Chile.

Where would the sentence best fit?

The most obvious limitation is weather conditions such as clouds, wind, and rain. At the best sites, where most telescopes are located, the weather is clear as much as 75% of the time. A Still, even on a clear night, the atmosphere filters out a certain amount of starlight. Astronomers therefore prefer dry sites with little water vapor, which is generally found at higher altitudes. The sky above the telescope should be dark. B Near cities, the air scatters the glare from lights, producing an illumination that hides the faintest stars and limits the distances that can be probed by telescopes. C Observatories are best located at least 100 miles from the nearest large city. The best observatory sites are therefore high, dark, and dry. The world's largest telescopes are found in such remote mountain locations as the Andes Mountains of Chile, the desert peaks of Arizona, and Mauna Kea in Hawaii, a dormant volcano. D

10. DIRECTIONS: An introductory sentence for a brief summary of the passage is provided below. Complete the summary by selecting the THREE answer choices that express the most important ideas in the passage. Some sentences do not belong in the summary because they express ideas that are not presented in the passage or are minor ideas in the passage. This question is worth 2 points.

Telescopes have evolved and improved over the years, as has the relationship astronomers have with these powerful machines.

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a. Sometimes astronomers can work thousands of miles away from observatories
b. Large telescopes with large openings can be very expensive to build
c. The lights produced by big cities make it impossible to see through telescopes
d. Light paths in the atmosphere change with the season creating challenges for smaller telescopes
e. Adaptive optics, invented by Horace Babcock in 1953, allows astronomers to see images in sharp focus
f. The best placements for telescopes are in remote, high, dry, and dark locations

Speciation

The biological definition of species, which works for sexually reproducing organisms, is a group of actually or potentially interbreeding individuals. According to this definition, one species is distinguished from another by the possibility of matings between individuals from each species to produce fertile offspring. There are exceptions to this rule. Many species are similar enough that hybrid offspring are possible and may often occur in nature, but for the majority of species, this rule generally holds. In fact, the presence of hybrids between similar species suggests that they may have descended from a single interbreeding species and that the speciation process may not yet be completed.

Given the extraordinary diversity of life on the planet, there must be mechanisms for speciation: the formation of two species from one original species. Darwin envisioned this process as a branching event and diagrammed the process in the only illustration found in *On the Origin of Species*. For speciation to occur, two new populations must be formed from one original population, and they must evolve in such a way that it becomes impossible for individuals from the two new populations to interbreed. Biologists have proposed mechanisms by which this could occur that fall into two broad categories. Allopatric speciation, meaning speciation in "other homelands," involves a geographic separation of populations from a parent species and subsequent evolution. Sympatric speciation, meaning speciation in the "same homeland," involves speciation occurring within a parent species while remaining in one location.

A geographically continuous population has a gene pool that is relatively homogeneous. Gene flow, the movement of alleles across the range of the species, is relatively free because individuals can move and then mate with individuals in their new location. Thus, the frequency of an allele at one end of a distribution will be similar to the frequency of the allele at the other end. When populations become geographically discontinuous that free-flow of alleles is prevented. When that separation lasts for a period of time, the two populations are able to evolve along different trajectories. Thus, their allele frequencies at numerous genetic loci gradually become more and more different as new alleles independently arise by mutation in each population. Typically, environmental conditions, such as climate, resources, predators, and competitors, for the two populations will differ causing natural selection to favor divergent adaptations in each group. Different histories of genetic drift, enhanced because the populations are smaller than the parent population, will also lead to divergence.

Isolation of populations leading to allopatric speciation can occur in a variety of ways: from a river forming a new branch, erosion forming a new valley, or a group of organisms traveling to a new location without the ability to return, such as seeds floating over the ocean to an island. The nature of the geographic separation necessary to isolate populations depends entirely on the biology of the organism and its potential for dispersal. If two flying insect populations took up residence in separate nearby valleys, chances are that individuals from each population would fly back and forth, continuing gene flow. However, if two rodent populations became divided by the formation of a new lake, continued gene flow would be unlikely; therefore, speciation would be more likely.

Can divergence occur if no physical barriers are in place to separate individuals who continue to live and reproduce in the same habitat? Sympatric speciation does also sometimes take place. For example, imagine a species of fish that lived in a lake. As the population grew, competition for food also grew. Under pressure to find food, suppose that a group of these fish had the genetic flexibility to discover and feed off another resource that was unused by the other fish. What if this new food source was found at a different depth of the lake? Over time, those feeding on the second food source would interact more with each other than the other fish; therefore they would breed together as well. Offspring of these fish would likely behave as their parents and feed and live in the same area, keeping them separate from the original population. If this group of fish continued to remain separate from the first population, eventually sympatric speciation might occur as more genetic differences accumulated between them.

Reading Paragraph 1

The biological definition of species, which works for sexually reproducing organisms, is a group of actually or potentially interbreeding individuals. According to this definition, one species is distinguished from another by the possibility of matings between individuals from each species to produce fertile offspring. There are exceptions to this rule. Many species are similar enough that hybrid offspring are possible and may often occur in nature, but for the majority of species, this rule generally holds. In fact, the presence of hybrids between similar species suggests that they may have descended from a single interbreeding species and that the speciation process may not yet be completed.

1. According to paragraph 1, which of the following is true?

- **a.** The definition of species only works for organisms that interbreed with each other
- **b.** In order to be considered a species, it must be possible for two individuals to have fertile offspring
- **c.** When two very similar species produce offspring it is called a hybrid
- **d.** Hybrid species do not occur often in nature

2. The phrase descended from in paragraph 1 is closest in meaning to

- **a.** Come from
- **b.** Gone down
- **c.** Relished in
- **d.** Provided for

Reading Paragraph 2

Given the extraordinary diversity of life on the planet, there must be mechanisms for speciation: the formation of two species from one original species. Darwin envisioned this process as a branching event and diagrammed the process in the only illustration found in *On the Origin of Species*. For speciation to occur, two new populations must be formed from one original population, and they must evolve in such a way that it becomes impossible for individuals from the two new populations to interbreed. Biologists have proposed mechanisms by which this could occur that fall into two broad categories. Allopatric speciation, meaning speciation in "other homelands," involves a geographic separation of populations from a parent species and subsequent evolution. Sympatric speciation, meaning speciation in the "same homeland," involves speciation occurring within a parent species while remaining in one location.

3. All of the following are true EXCEPT

- **a.** Speciation involves the creation of two different species from one species
- **b.** There is only one illustration in Darwin's *On the Origin of Species*
- **c.** It is only considered speciation if two new species can not interbreed
- **d.** There are a few vague categories that describe how speciation could happen

4. What can be inferred from the information in paragraph two?

- **a.** There are likely more than two categories that the mechanisms of speciation could be classified under
- **b.** The concept of speciation and the mechanisms by which it occurs are not fully understood by biologists
- **c.** Darwin did not believe that diagrams added any value to his work
- **d.** There are a few conditions that must be met in order for speciation to occur

Reading Paragraph 3

A geographically continuous population has a gene pool that is relatively homogeneous. Gene flow, the movement of alleles across the range of the species, is relatively free because individuals can move and then mate with individuals in their new location. Thus, the frequency of an allele at one end of a distribution will be similar to the frequency of the allele at the other end. When populations become geographically discontinuous that free-flow of alleles is prevented. When that separation lasts for a period of time, the two populations are able to evolve along different trajectories. Thus, their allele frequencies at numerous genetic loci gradually become more and more different as new alleles independently arise by mutation in each population. Typically, environmental conditions, such as climate, resources, predators, and competitors, for the two populations will differ causing natural selection to favor divergent adaptations in each group. Different histories of genetic drift, enhanced because the populations are smaller than the parent population, will also lead to divergence.

5. What does the author say about alleles in paragraph three?

- **a.** Gene flow is quite restricted within a geographically continuous population
- **b.** Alleles flow even more freely in geographically discontinuous populations than in continuous populations
- **c.** Allele frequencies that have been separated for a long time start to become more various
- **d.** The frequencies of alleles from one end of a distribution to another in a geographically discontinuous population are similar

6. Which of the following best expresses the essential information in the highlighted sentence in paragraph 3? Incorrect choices change the meaning in important ways or leave out essential information.

- **a.** Each population faces different consequences due to the environment in which they live
- **b.** The climate has a critical impact on the development of the genetics of each population
- **c.** Sometimes the environment can affect the way in which each population separates
- **d.** The environments of each population varies leading to adaptations which affect natural selection

Reading Paragraph 4

Isolation of populations leading to allopatric speciation can occur in a variety of ways: from a river forming a new branch, erosion forming a new valley, or a group of organisms traveling to a new location without the ability to return, such as seeds floating over the ocean to an island. The nature of the geographic separation necessary to isolate populations depends entirely on the biology of the organism and its potential for dispersal. If two flying insect populations took up residence in separate nearby valleys, chances are that individuals from each population would fly back and forth, continuing gene flow. However, if two rodent populations became divided by the formation of a new lake, continued gene flow would be unlikely; therefore, speciation would be more likely.

7. According to paragraph 4, which of the following is true?

- **a.** It is impossible for any organism to continue gene flow with its original population if it becomes separated from them
- **b.** Populations can only be separated by new geographic formations that result in allopatric speciation
- **c.** Some organisms that become separated from its original population do not have the ability to return to its original location
- **d.** Speciation is more likely when continued gene flow has a higher possibility of occurring

Reading Paragraph 5

Can divergence occur if no physical barriers are in place to separate individuals who continue to live and reproduce in the same habitat? Sympatric speciation does also sometimes take place. For example, imagine a species of fish that lived in a lake. As the population grew, competition for food also grew. Under pressure to find food, suppose that a group of these fish had the genetic flexibility to discover and feed off another resource that was unused by the other fish. What if this new food source was found at a different depth of the lake? Over time, those feeding on the second food source would interact more with each other than the other fish; therefore they would breed together as well. Offspring of these fish would likely behave as their parents and feed and live in the same area, keeping them separate from the original population. If this group of fish continued to remain separate from the first population, eventually sympatric speciation might occur as more genetic differences accumulated between them.

8. Why does the author ask the question "Can divergence occur if no physical barriers are in place to separate individuals who continue to live and reproduce in the same habitat?"?

- **a.** To question the validity of the theory of speciation
- **b.** To transition to and introduce the next topic in a creative way
- **c.** Because he is curious about this topic and wants the reader to think about it
- **d.** To propose a new question that has never been asked before regarding this topic

9. Look at the four squares (A, B, C, D) that indicate where the following sentence could be added to the passage.

Charles Darwin, the first to describe the role of natural selection in speciation, wrote about the mechanisms of speciation.

Where would the sentence best fit?

A Given the extraordinary diversity of life on the planet, there must be mechanisms for speciation: the formation of two species from one original species. B Darwin envisioned this process as a branching event and diagrammed the process in the only illustration found in *On the Origin of Species.* C For speciation to occur, two new populations must be formed from one original population, and they must evolve in such a way that it becomes impossible for individuals from the two new populations to interbreed. D Biologists have proposed mechanisms by which this could occur that fall into two broad categories.

10. DIRECTIONS: An introductory sentence for a brief summary of the passage is provided below. Complete the summary by selecting the THREE answer choices that express the most important ideas in the passage. Some sentences do not belong in the summary because they express ideas that are not presented in the passage or are minor ideas in the passage. This question is worth 2 points.

For over a century, biologists have been trying to understand and define the mechanisms for speciation.

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a. The definition of species is a group of organisms that have the capacity to interbreed
b. Scientists have organized the mechanisms for speciation into two categories: allopatric and sympatric
c. In his *On the Origin of Species*, Darwin theorized that the speciation process was a branching event
d. The formation of a new branch of a river is an example of an event that leads to allopatric speciation
e. Certain species, like flying species, can carry-on multiple gene pools as they travel between populations
f. The second category of speciation mechanisms states that speciation can occur when individuals live and breed in the same location

TST Prep - Complete TOEFL Test #11

Reading Section

Answer Key

The Grading Rubric

Use the chart below to determine your score in the reading section.

There are only 30 questions in this reading section, but the highest raw score is 33. The last question of each passage, either in the form of a summary or organization questions are worth two to three points since they require more than one answer

Summary questions are worth two points. If all three choices are correct, award yourself two points. If two choices are correct and one is incorrect, award yourself one point. If two or more choices are incorrect, you earn zero points for the given question.

Organization questions are worth three points. If all five choices are correct, award yourself three points. If four choices are correct and one is incorrect, award yourself two points. If three choices are correct and two are incorrect, award yourself one point. If three or more choices are incorrect, you earn zero points for the given question.

Raw Points	Score Estimate	Raw Points	Score Estimate	Raw Points	Score Estimate
33	30	22	20	11	10
32	29	21	19	10	9
31	28	20	18	9	8
30	27	19	17	8	7
29	26	18	16	7	6
28	25	17	15	6	5
27	25	16	15	5	5
26	24	15	14	4	4
25	23	14	13	3	3
24	22	13	12	2	2
23	21	12	11	1	1

The Importance of Seed Plants: Answer Key

1. B (detail)

B is correct because the paragraph says that the agricultural revolution was "*when human societies made the transition from nomadic hunter-gatherers to horticulture and agriculture.*" Option A is wrong because the original sentence says that "*Many societies eat almost exclusively vegetarian*," not that most societies do - the modifier changes the meaning significantly. Also, it is never mentioned whether or not they consume meat or fish. Option C is incorrect because the paragraph says that nuts and beans are a source of protein, not that they are an essential part of the human diet. Option D is wrong because humans get fats from oil and olives, not protein - *"beans and nuts supply proteins."*

2. C (vocabulary)

C is correct because "obtained from" is closest in meaning to "derived from" which means "taken, acquired, or obtained from." Choices A and B can be eliminated because "given to" and "prepared for" imply that something is being given to seed plants when the point of the sentence and paragraph is about the food "obtained from" seed plants.

3. D (detail)

D is correct because the paragraph says, *"Spices come from many different plant parts…black pepper and vanilla are seeds…and herbs that flavor many dishes come from dried leaves…".* Option A is incorrect because *"Drinks are made from infusions of tea leaves…crushed coffee beans…,"* not spices. Option B is wrong because this is not stated in the paragraph, and C is wrong because the paragraph does not say that the majority are from leaves fruit, but that *"herbs that flavor many dishes come from dried leaves and fruit."*

4. D (negative detail)

D is correct because the statement is false. The modifier "most" changes the meaning of the original statement, which is that some alcohol is made by the "fermentation of carbohydrates derived from seeds, as with beers". Options A-C are incorrect because they are all accurate statements from the paragraph.

5. D (detail)

D is correct because the second sentence says, *"Plant life balances ecosystems…moderate climate…"* which is the same as sayings plants stabilize ecosystems. Option A is wrong because plants do not "create" watersheds, but instead "protect" them. Option B is incorrect because it misstates the first sentence. Plants do not create biodiversity, "*biodiversity ensures a resource for new food crops and medicines."* Option C is incorrect because the paragraph says plant life *"provides shelter for many animal species*" not that they feed the majority of animal species.

6. C (paraphrase)

C is correct because it properly summarizes the main point of the sentence, which is that the growing human population is affecting and encroaching upon forested areas. Option A is incorrect because, while true, it is just a detail adding information to the main point. Option B is incorrect because, again, it is true but it is a small detail of the sentence. Option D is incorrect because this changes what the sentence is stating.

7. B (author's purpose)

B is correct because the paragraph deals with the impact that humans have on the environment as they continue to use plants to extinction. This sentence shows that humans don't even understand the full scope of their impact on the environment because they don't even know all the species of plants nor how their extinction will affect ecosystems. Option A is wrong because this is the opposite of what is mentioned in the paragraph. Option C might be true but it is not the point of the sentence nor is it related to the rest of the information in the paragraph. Option D is incorrect because the author does imply this by talking about unknown species and this is not the point of the paragraph, or the passage.

8. A (detail)

A is correct because the last sentence says, *"Barcoding is a technique in which one or more short gene sequences…are used to identify a species through DNA analysis."* Option B is incorrect because preserving heirloom seeds does not answer the question though it is stated in the paragraph as something that needs to be done. Option C is wrong because the second half of the answer is not mentioned in the paragraph. Option D is incorrect because DNA analysis is only one part of the process, thus it is an incomplete response.

9. D (sentence insertion)

D is correct because the sentence is a concluding one that summarizes the paragraph. This sentence makes a statement about the information in the paragraph and provides a nice transition to the next paragraph. The pronoun referents "their use" and "medicine" signal that the sentence should follow the previous sentences that discuss the uses of the subject, "plants."

10. B, C, F (summary)

B, C, and F are correct. These options contain critical information that is further explained throughout the passage. They are broad statements that require elaboration but are directly related to the summary statement and the main discussion of the whole passage. Options A, D, and E are details that provide more information about the main topic but are not necessarily essential to the discussion.

Telescopes: Answer Key

1. B (detail)

B is the correct answer because the author says this in the last sentence. A and C are not correct because they misstate the information in the paragraph. They do not spend most of their time looking through telescopes and most do not live at observatories. D is also incorrect because the paragraph never says that they do not have time to measure and analyze their data.

2. D (detail)

D is the correct answer because the author points out that telescopes need to be "*placed in the best possible spot*" in the second sentence. A is not correct because it does not appear in the paragraph. B is not correct because of the word "always." Also, C is not correct because they are expensive, not economical.

3. C (paraphrasing)

C is the correct answer because it best paraphrases the main idea of the sentence. In this sentence the author is explaining that astronomers must consider conditions or factors for the site because of the Earth's atmosphere. A and B are not correct because they change the meaning of this sentence. D is incorrect because this sentence leaves out essential information.

4. D (negative detail)

D is correct because it is not in the paragraph. The author does not state what the worse location for a telescope is. A is incorrect because the paragraph states that the world's largest telescopes are in "*the desert peaks of Arizona, and Mauna Kea in Hawaii.*" B is also incorrect because the paragraph says, "*the atmosphere filters out a certain amount of starlight.*" C is not correct because it is true; the best site is where *"the weather is clear as much as 75% of the time."*

5. B (author's purpose)

B is the correct answer because the phrase illustrates an exciting high-resolution observation using a metaphor. The author is naming exciting observations astronomers are eager to see in detail, such as see a galaxy that ate its neighbor for lunch. Galaxies do not literally eat their neighboring galaxies for lunch. This is a metaphor used to illustrate this observation. A is wrong because it does not explain how much resolution can show. D is also not correct because the author's purpose is not to show why, but that it is something astronomers can see. C is incorrect because while this is a use of the telescope, it is not part of a "comprehensive list", just a few examples.

6. D (detail)

D is the correct answer because according to the paragraph, resolution refers to precise and sharp details of images, and "*Larger apertures produce sharper images.*" A and B are not correct because they include details in the answer not found in the paragraph. C is also incorrect because it misstates the facts in the last sentence.

7. C (author's purpose)

C is the correct answer because the phrase explains the effect from the cells of air constantly blown in the wind is that the path followed by the light is constantly changing. A is wrong because the changing path is not the cause, it is an effect. B is also incorrect because this phrase does not define the reason the wind blows, but the effect from it. D is the author's overall purpose in this paragraph, but not the purpose for using this phrase.

8. D (vocabulary)

D is correct because "altered" is closest in meaning to "distorted." A ("ruined") is incorrect because the paragraph later states that the light brought it back to focus, so we know from the context that the image is not ruined. B ("corrected") means the opposite of "distorted." C ("diluted") does not make sense because this is not something that we would say the atmosphere can do to an image.

9. D (sentence insertion)

D is the correct answer because the sentence best fits here. This sentence states there is another telescope that will be five times larger than the largest telescopes being built in the driest desert. Therefore, it makes the most sense to put this sentence here, after the sentence listing the largest telescopes found in high, dark and dry locations. A is not correct because it does not fit with the sentences before and after it. B and C are also incorrect because in this part, the author is talking about why cities are not a good place for a telescope's location.

10. A, B, F (summary)

A, B and F are the correct answers. B is correct because the cost for large telescopes makes the placement an important consideration. C is not correct because the passage does not say city lights make it impossible, only that distant stars cannot be seen. D is incorrect because it misstates the facts about light paths in paragraph six. E is not correct because it includes facts about adaptive optics that does not appear in the passage.

Speciation: Answer Key

1. C (detail)

C is correct because it is the only true choice. Options A, B, and D are incorrect because they are untrue. Option A is wrong because the original sentence is, "*The biological definition of species, which works for sexually reproducing organisms, is a group of actually or potentially interbreeding individuals.*" Options B and D can be eliminated because they are not mentioned in this paragraph.

2. A (vocabulary)

A is correct because, in this case, "descended from" is closest in meaning to "come from" as in to be born from or derived from. While "descend" does also mean "go down," this is not the correct meaning in this context, so option B is incorrect. Option C ("relished in") is wrong because it means to take pleasure in something, which does not fit the discussion. By reading the full sentence, we can determine that option D ("provided for") does not fit grammatically or within the context as it is talking about the production of offspring.

3. D (negative detail)

D is correct because it is not true. The paragraph tells us that *"Biologists have proposed mechanisms by which this could occur that fall into two broad categories."* "A few" and "two" are not the same. Option A is incorrect because the passage states that speciation is *"the formation of two species from one original species."* B is also incorrect because the passage says, "*the process in the only illustration found*" in Darwin's *On the Origin of Species*. FInally, C is incorrect because the passage states, "*and they must evolve in such a way that it becomes impossible for individuals from the two new populations to interbreed*".

4. B (inference)

B is correct because the paragraph tells us about how "*Darwin envisioned this process,*" meaning he imagined or considered it a certain way, and that "B*iologists have proposed mechanisms by which this could occur...*". This language, specifically "*proposed*," leads us to infer that the process of speciation and its mechanisms are not fully understood. Option A can be eliminated because nothing in the paragraph allows us to infer this. We could infer that there might be more than two, but we cannot infer that there are likely more than two. Option C cannot be inferred because there is not enough information in the paragraph as to why he did not include more illustrations in his work. Option D is incorrect because it is specifically stated in the paragraph and is not an inference.

5. C (detail)

C is correct because the paragraph says, *"allele frequencies at numerous genetic loci gradually become more and more different as new alleles independently arise by mutation in each population."* Option A can be eliminated because it is the opposite of what is stated in paragraph three. Option B is wrong because it also states the opposite of the original sentence which says, *"When populations become geographically discontinuous that free-flow of alleles is prevented."* Option D is incorrect because the author explains that the frequencies of alleles in geographically continuous populations are similar at each end, not geographically discontinuous as this option states.

6. D (paraphrase)

D is correct because this option most accurately paraphrases the original sentence. Option A can be eliminated because it refers to consequences, and in this context, consequences does not make sense. Option B is incorrect because the sentence does not say that the climate alone has a critical impact on the development of the genetics; the original sentence says that many conditions affect each population's adaption. Option C is wrong because this is not at all what the original sentence means.

7. C (detail)

C is correct because it is true; the paragraph tells us that a *"group of organisms traveling to a new location without the ability to return, such as seeds floating over the ocean to an island"* can lead to allopatric speciation. Option A is incorrect because some organisms can travel between the two locations and populations. Option B is wrong because it is untrue; the original sentence says that *"allopatric speciation can occur in a variety of ways."* Option D is incorrect because it states the opposite of what the information in the paragraph says.

8. B (author's purpose)

B is correct because the question comes at the beginning of the paragraph, so we know it's transitioning from the previous paragraph and introducing the new one. Authors sometimes use this method to transition between and introduce new topics. Option A can be eliminated because the question is not regarding the validity of speciation. Option C is wrong because the author immediately answers the question with facts, so it's not out of curiosity that he poses it. Option D can also be eliminated because the author answers the question, meaning it has been asked and answered previously.

9. B (sentence insertion)

B is correct because the following sentence refers back to Charles Darwin by only using his last name. This means that he would have already been introduced prior to this pronoun referent, and thus, this sentence fits best here. Since the first sentence in the paragraph introduces and talks about "mechanisms for speciation," it makes sense that the missing sentence should follow. It provides more information about these mechanisms.

10. B, C, F (summary)

B, C, and F are correct because they are related to the summary statement, and they are explained in detail throughout the passage. Options A, D, and E are incorrect because they are just details or examples that provide more information and do not require elaboration, nor are they directly related to the summary sentence.