

2025 Temmuz
YÖKDİL

Fen Bilimleri

1

By 1997, the phenomenon of Internet-based electronic commerce was fully launched, with wide ranging ---- for businesses, consumers, and society, which made the idea of commerce over the Internet both feasible and attractive.

- A) objections
- B) implications
- C) accusations
- D) constraints
- E) suspicions

2

Aestivation is the scientific name for the practice of summer hibernation, which refers to the period when animals lower their heart rate and metabolism for the ---- of their energy as a survival strategy in countries with extreme heat.

- A) deterioration
- B) conservation
- C) removal
- D) interruption
- E) inspection

3

In palaeontological climate studies, better instruments have brought an ---- level of precision to analyses, allowing researchers to zoom in on ever narrower timescales to understand climatic effects on human populations.

- A) indistinguishable
- B) inconsistent
- C) unprecedented
- D) irreversible
- E) unacceptable

4

It is only with the rise of modern astronomy and space technology that scientists have been able to ---- investigate the chemical evolution of the universe.

- A) inherently
- B) properly
- C) temporarily
- D) inevitably
- E) obscurely

5

Although no algorithm is infinitely complex, there are some that would require millions of years to be ---- by a human being but can be done within a few seconds by computers.

- A) executed
- B) postponed
- C) defended
- D) dispersed
- E) hindered

6

New research shows that animals use various communication strategies; for example, dogs and birds take turns when they communicate, and chimpanzees ---- a form of reciprocal conversation.

- A) give up
- B) break off
- C) engage in
- D) prevail over
- E) turn down

7

By the early 18th century, the developmental patterns of many organisms ----; however, there was still much disagreement about how the early stages ----.

- A) have been observed / were progressing
- B) must have been observed / would progress
- C) had been observed / progressed
- D) would have been observed / used to progress
- E) could have been observed / should progress

8

Although researchers ---- access to an unexplored area of the Pacific Ocean after an advanced US submersible named Nereus ---- 10 kilometres underwater during a deep-sea expedition, they remain positive about the future of deep-sea explorations.

- A) are losing / had disintegrated
- B) would lose / could disintegrate
- C) will lose / may have disintegrated
- D) had lost / would have disintegrated
- E) have lost / disintegrated

9

Today, the Sun is --- constant surveillance from space because the more we understand the Sun, the better we are able to predict when a potentially dangerous solar storm will be directed --- the Earth.

- A) against / within
- B) at / around
- C) under / towards
- D) about / onto
- E) for / behind

10

Most animals are born with a fixed set of sounds --- communication, and a few, such as songbirds, can imitate other sounds they hear --- them.

- A) with / on
- B) into / over
- C) along / upon
- D) for / around
- E) about / through

11

Enzymes can catalyse a broad range of chemical transformations --- remarkable selectivity and specificity, and most enzymes are very efficient and operate --- mild conditions.

- A) with / in
- B) across / towards
- C) from / on
- D) about / over
- E) beyond / above

12

Crop rotation is switching plant species within an environment --- a resident insect population which is adapted to one of the crops cannot survive when a new one is planted into the field.

- A) so that
- B) just as
- C) although
- D) before
- E) whether

13

Air conditioning is commonly thought of as a method of cooling interiors; ---, it also treats the factors of temperature, humidity, purity, and movement of air.

- A) as a result
- B) conversely
- C) however
- D) otherwise
- E) for example

14

In 1869, the Russian chemist Dmitri Mendeleev proposed arranging the elements in groups according to their shared properties in a periodic table; ---, he changed a highly speculative branch of chemistry into a true, logical science.

- A) otherwise
- B) instead
- C) as a result
- D) still
- E) in contrast

15

--- puffer fishes have an impressive arsenal of defensive tactics, they may be threatened as a result of overfishing for resale to meet the demands of the tourist industry.

- A) As
- B) If
- C) After
- D) Even though
- E) When

16

--- smartphone applications that identify plants from photographs can be as very little as 4 per cent accurate, they can put people searching for food at risk and also lead to endangered plants being mislabelled.

- A) Because
- B) While
- C) Until
- D) As if
- E) As soon as

17

Scientists have developed computer systems that use artificial intelligence to better analyse the images of seafloor --- algorithms to improve search and navigation of a target area.

- A) as well as
- B) regardless of
- C) in case of
- D) despite
- E) unlike

18

--- the modern influence of human activities on atmospheric chemistry, the naturally occurring greenhouse gases had fairly stable atmospheric concentrations.

- A) For the purpose of
- B) Prior to
- C) In relation to
- D) Instead of
- E) Thanks to

19

Being a prolific scientist, Albert Einstein --- published his special theory of relativity --- two other theories that became part of the fundamental understanding of matter in the universe in 1905.

- A) whether / or
- B) so / that
- C) not only / but also
- D) the more / the more
- E) either / or

20

A research team at Stanford University analysed the spread of viral pathogens in 5,380 agricultural plant populations by using data from previous studies that focused on plant populations --- some diseases are typically present.

- A) where
- B) which
- C) what
- D) how
- E) why

Researchers wonder about people's attitude towards renewable energy sources and how to approach it. A common approach in attitude studies is to use the sociodemographic characteristics of the respondents to explain variation (21)---- the attitude towards wind power, such as gender, education, income, and age. The attitude relations of the first three sociodemographic variables (22)---- different directions. For example, most educated individuals promote the use of wind power by considering its ecological benefits, while those who are less knowledgeable remain indifferent to the issue. (23)----, the effect of age on the acceptance of wind power seems to be more consistent. (24)---- a few surveys that reveal negative attitudes adopted by the youth, the main headline seems to be that younger people are more positive towards wind power when compared to older people. The relevance of this apparent age effect (25)---- in a broader perspective with future research.

21

- A) on
- B) from
- C) to
- D) at
- E) in

22

- A) release
- B) suspend
- C) precede
- D) indicate
- E) accumulate

23

- A) Likewise
- B) Accordingly
- C) Yet
- D) For instance
- E) In other words

24

- A) With the goal of
- B) Except for
- C) In terms of
- D) Due to
- E) By means of

25

- A) can be seen
- B) has been seen
- C) may have been seen
- D) was seen
- E) had been seen

The modern era of Mars exploration provides ample evidence that at least some of Mars' surface may once have been a habitable environment for life as we know it – and that parts of the planet's subsurface could still be habitable today. The (26)---- of related evidence comes from the early 1970s with the Mariner 9 orbiter, which returned spectacular photos of water-carved landforms. These and higher-resolution images from more recent spacecraft (27)---- a wealth of geologic features suggesting water's presence: landscapes carved by catastrophic floods; streams, rivers, and deltas created by the persistent flow of water and many more. All these features support the hypothesis of Mars' habitability as they invoke the presence of liquid water. (28)---- the existence of energy sources and organic molecules, water is one of the key ingredients necessary for life as we know it. (29)----, findings opened up a new pathway in the search for Martian life. Researchers now devise search strategies (30)---- sampling materials from beneath the surface that have had little or no exposure to the current surface environment.

26

- A) controversy
- B) abundance
- C) precaution
- D) obligation
- E) severity

27

- A) have revealed
- B) will reveal
- C) were revealing
- D) had revealed
- E) would have revealed

28

- A) Along with
- B) As opposed to
- C) Despite
- D) Regarding
- E) Thanks to

29

- A) On the contrary
- B) Instead
- C) Otherwise
- D) Furthermore
- E) Firstly

30

- A) among
- B) for
- C) against
- D) beyond
- E) within

31

--- because the amount of light it spreads across the sky is detrimental to viewing faint little celestial bodies through telescopes.

- A) The light that is reflected by the Earth and illuminates the Moon is known as earthshine
- B) The Moon is an impressive object that is not always welcomed by astronomers
- C) Earthshine is not visible in the sky unless the Moon is at its waxing Moon phase
- D) In terms of reflecting the light, the Moon is not as reflective as the Earth
- E) Astronomers refer to the early phases between new Moon and full Moon as waxing phases

32

While greenhouses were developed in northern regions as a means of protecting crops against cold temperatures, ----.

- A) they are also used in arid regions with the aim of preventing excessive solar radiation exposure
- B) they can meet the increasing consumer demand for high-quality food products
- C) in countries where greenhouse production is an important industry, universities are generally involved in research on crop production
- D) the largest growth of the greenhouse industry occurred throughout the world following World War II
- E) low-tech greenhouses are sufficient for winter production in the mild winter climates

33

Even though the Canadian Arctic is a freezing desert with little moisture, ----.

- A) animals adapted to the region generally migrate north in spring and head south in winter
- B) the forest north of the 60th parallel of latitude yields to frozen tundra and rock
- C) the icy ground is known as permafrost and offers little to no vegetation
- D) wildlife flourishes in the brief summer when the top layer of ice melts
- E) the tundra is mostly bare and frozen year-round a few inches below the surface

34

Given that reliable and extensive climate data has only been collected randomly and partially for little more than 100 years, ----.

- A) predicting future climates is vital for maintaining the existence of certain species
- B) climatologists have to rely on proxy data such as lake levels and soil type when interpreting past climates
- C) timed predictions of climatic developments can be made on a daily or monthly basis
- D) researchers have reported river freezings, crop failures, and years without summers
- E) there has been a steady increase in the extreme weather events recently due to global warming

35

---- as new farming practices reduced the number of workers needed to produce food for the growing population.

- A) The mid-1700s saw a shift from an agricultural society to an industrial society
- B) Prior to the 18th century, agricultural practices were as they had been since the Middle Ages
- C) Great Britain was once an agricultural society in which farmers worked long hours using simple tools
- D) The agricultural sciences flourished in the Western world during the 19th century
- E) Mechanisation of agriculture made food production very efficient in developed nations

36

New technologies are often equated with significant progress ----.

- A) given that they may also have negative social side effects and may cause a shift of power from one group to another
- B) although they are indispensable in making our daily lives much easier and ensuring a better future
- C) while they help us to eradicate diseases and communicate with our friends around the world
- D) before every individual focuses on how they will use these technologies at home, in public places, and at work
- E) because they can help us to do things that were not previously possible and solve problems that have plagued humanity for centuries

37

Fire might be used to control weed development, which can lead to destruction of vegetation and recovery of clean land for cultivation; ----.

- A) therefore, weeds can interfere with fruit crop cultivation and production, nutritional elements, light, and air that are available in reduced quantities
- B) for example, weeds can cause indirect damage by creating microclimate conditions that can favour the growth of microorganisms
- C) however, only a reduced percentage of weed seeds is killed that way and weeds can consistently develop during the following cultivation cycle
- D) conversely, in cool climate zones, weed vegetative growth is greatly reduced during extreme seasons
- E) actually, weeds can produce chemical compounds that can exert allelopathy, resulting in tree growth limitation

38

The fact that cloned organisms are prone to numerous health problems and tend to die prematurely puzzles genetic engineers ----.

- A) because natural clones such as identical twins do not experience these challenges
- B) just as genomic clones are the same regardless of the cell type used to prepare them
- C) provided that manipulated cloning is primarily a research method at present
- D) so that scientists can use cloning for therapeutic applications in creating recombinant DNA products
- E) whereas the cloning of entire organisms, such as Dolly the sheep, is extraordinarily difficult

39

----, agriculture and domestication of animals freed humans to develop a wide range of impressive technologies.

- A) Just as hunting enhanced hand skills and major cognitive developments
- B) Even if hunter-gatherer communities could not support high population densities due to the unpredictability of food resources
- C) Since techniques used by hunter-gatherers to increase food supplies included the use of fire to stimulate new growth
- D) Given that Arctic peoples, who are well adapted to metabolising foods high in animal fat, relied primarily on hunting
- E) Although knives were used for hunting and personal protection from the earliest times until well into the Middle Ages

40

Dry climatic conditions provided a suitable niche for the establishment of Neolithic settlements ----.

- A) because they could not cultivate the land when precipitation ceased for a long time
- B) given that people living in this climate had developed a nomadic lifestyle where grazing was the only economic activity
- C) although dry climates had unique qualities that have intrigued travellers and investigators alike
- D) as debilitating waterborne diseases such as malaria, which inflict the more humid areas, were less common in arid zones
- E) since these climates posed a potential danger for those travelling there due to extreme weather elements

41

----; therefore, international cooperation is necessary to fully and effectively fight cybercrime.

- A) Cybercrime is unique in that the perpetrator and the victim of such a crime can be anywhere in the world
- B) Countries using cyberattacks against each other raise the question as to whether these activities are truly crimes or acts of war
- C) Old criminal legislation in many instances is still applicable to cyber situations, thus not requiring any additional legislation
- D) One's motivations for committing cybercrime may have an impact on what type of cybercrime that person commits
- E) In a cyber incident, an individual's personal rights can be violated with the revelation of private data

42

The information technology revolution, which has impacted every facet of business world, society, and life with a speed beyond imagination, can be regarded as the latest revolution in the history of humankind.

- A) Bilgi teknolojisi devrimi; iş dünyasının, toplumun ve hayatın her yönünü hayal gücünün ötesinde bir hızla etkilemenin yanı sıra insanlık tarihindeki en son devrim olarak da değerlendirilebilir.
- B) İnsanlık tarihindeki en son devrim olarak değerlendirilebilecek bilgi teknolojisi devriminin iş dünyasının, toplumun ve hayatın her yönünü etkilediği hız, hayal gücünün ötesindedir.
- C) İnsanlık tarihinin en son devrimi olarak değerlendirilen bilgi teknolojisi devrimi, hayal gücünün ötesinde bir hızla iş dünyasının, toplumun ve hayatın her yönünde etkili olmuştur.
- D) İnsanlık tarihindeki en son devrim olarak değerlendirilebilen bilgi teknolojisi devrimi, iş dünyasının, toplumun ve hayatın her yönünü hayal gücünün ötesinde bir hızla etkilemiştir.
- E) İş dünyasının, toplumun ve hayatın her yönünü hayal gücünün ötesinde bir hızla etkileyen bilgi teknolojisi devrimi, insanlık tarihindeki en son devrim olarak değerlendirilebilir.

43

Although the global positioning system, developed at the end of the 20th century was expected to render all previous navigation technologies impractical, some of these technologies are still being used in certain commercial applications.

- A) 20. yüzyılın sonunda küresel konumlandırma sisteminin geliştirilmesinden sonra beklenen şey, önceki tüm navigasyon teknolojilerinin kullanışsız hâle gelmesiyken belirli ticari uygulamalarda hâla bu teknolojilerin bazıları kullanılmaktadır.
- B) 20. yüzyılın sonunda geliştirilen küresel konumlandırma sisteminin önceki tüm navigasyon teknolojilerini kullanışsız hâle getirmesi beklendiyse de bu teknolojilerin bazıları belirli ticari uygulamalarda hâla kullanılmaktadır.
- C) Küresel konumlandırma sisteminin daha önce geliştirilen tüm navigasyon teknolojilerini 20. yüzyılın sonunda kullanışsız hâle getirmesi beklendiyse de bazı ticari uygulamalar hâla bu teknolojileri kullanmaktadır.
- D) 20. yüzyılın sonunda küresel konumlandırma sistemi geliştirildiğinde önceki tüm navigasyon teknolojilerini kullanışsız hâle getirmesi beklenmişti ancak bazı teknolojiler belirli ticari uygulamalarda hâla kullanılmaktadır.
- E) Daha önceki tüm navigasyon teknolojilerinin, küresel konumlandırma sisteminin geliştirilmesiyle 20. yüzyılın sonunda kullanışsız hâle gelmesi beklenmişti ancak bu teknolojilerin bazıları belirli ticari uygulamalarda hâla kullanılmaktadır.

44

Even if agricultural plants have access to as much water as they need, their productivity usually depends on their ability to obtain nitrogen in suitable forms.

- A) Tarımsal bitkilerin ihtiyaç duydukları kadar suya erişimi olsa bile verimlilikleri genellikle nitrojeni uygun formlarda alabilmelerine bağlıdır.
- B) İhtiyaç duydukları kadar suya erişimi olan tarımsal bitkilerin verimliliği bile genellikle nitrojeni uygun formlarda alabilmelerine bağlıdır.
- C) Verimlilikleri genellikle nitrojeni uygun formlarda alabilmelerine bağlı olan tarımsal bitkilerin ihtiyaç duydukları kadar suya erişimi vardır.
- D) Genellikle ihtiyaç duydukları kadar suya erişimi olan tarımsal bitkilerin bile verimli olmaları, nitrojeni uygun formlarda alabilmelerine bağlıdır.
- E) Tarımsal bitkilerin verimliliği, nitrojeni uygun formlarda alabilmelerine bağlı olsa da genellikle ihtiyaç duydukları kadar suya erişimi vardır.

45

The Arctic tern may see more daylight each year than all other creatures because it spends so much time in high latitudes of both hemispheres, where days are long during the summer.

- A) Kuzey yarımküre, yaz boyunca günlerin uzun olduğu her iki yarım kürenin yüksek enlemlerinde çok fazla zaman geçirdiği için her yıl diğer tüm canlılardan daha fazla gün ışığı görebilir.
- B) Yaz boyunca günlerin uzun olduğu her iki yarım kürenin yüksek enlemlerinde çok fazla zaman geçiren Kuzey yarımküre, her yıl diğer tüm canlılara kıyasla daha fazla gün ışığı görebilir.
- C) Kuzey yarımküre, günlerin yaz boyunca uzun olduğu her iki yarım kürenin yüksek enlemlerinde çok fazla zaman geçirerek her yıl diğer tüm canlılardan daha fazla gün ışığı görür.
- D) Kuzey yarımküresinin her yıl diğer tüm canlılardan daha fazla gün ışığı görebilmesinin nedeni, her iki yarım kürenin yüksek enlemlerinde yaz boyunca günlerin uzun olması ve buralarda çok fazla zaman geçirmesidir.
- E) Diğer tüm canlılara kıyasla daha fazla gün ışığı gören Kuzey yarımküre, günlerin uzun olduğu her iki yarım kürenin yüksek enlemlerinde yaz boyunca çok fazla zaman geçirir.

46

Stem cells in adult humans are found in bone marrow and fat tissues, and they can both divide indefinitely in a laboratory setting and be stimulated into becoming a variety of cell types.

- A) Laboratuvar ortamında sonsuz kez bölünebilen kök hücreler, hem yetişkin insanların kemik iliğinde ve yağ dokularında bulunur hem de çeşitli hücre türlerine dönüştürülmek üzere uyarılabilir.
- B) Yetişkin insanların kemik iliğinde ve yağ dokularında bulunan kök hücreler, laboratuvar ortamında sonsuz kez bölünebilirken çeşitli hücre türlerine dönüştürülmek üzere de uyarılabilirler.
- C) Yetişkin insanlarda kök hücreler kemik iliğinde ve yağ dokularında bulunur ve hem laboratuvar ortamında sonsuz kez bölünebilir hem de çeşitli hücre türlerine dönüştürülmek üzere uyarılabilirler.
- D) Kök hücreler yetişkin insanlarda kemik iliğinde ve yağ dokularında bulunur ve laboratuvar ortamında sonsuz kez bölünebilmelerinin yanı sıra uyarılarak çeşitli hücre türlerine de dönüştürülebilirler.
- E) Kök hücreler yetişkin insanların kemik iliğinde ve yağ dokularında bulunur ve hem laboratuvar ortamında sonsuz kez bölünebilir hem de uyarılarak çeşitli hücre türlerine dönüştürülebilirler.

47

Many industrialised countries have prioritised the development of policies based on sustainable energy sources in order to cope with environmental pollution resulting from the overexploitation of fossil fuels.

- A) Birçok sanayi ülkesi, fosil yakıtların aşırı kullanımından kaynaklanan çevre kirliliği ile mücadele etmek için sürdürülebilir enerji kaynaklarına dayalı politikaların geliştirilmesine öncelik vermiştir.
- B) Birçok sanayi ülkesinin sürdürülebilir enerji kaynaklarına dayalı politikaların geliştirilmesine öncelik vermesinin sebebi, fosil yakıtların aşırı kullanımından kaynaklanan çevre kirliliği ile mücadele etmektir.
- C) Fosil yakıtların aşırı kullanımından kaynaklanan çevre kirliliği ile mücadele eden birçok sanayi ülkesi, sürdürülebilir enerji kaynaklarına dayalı politikaların geliştirilmesine öncelik vermiştir.
- D) Fosil yakıtların aşırı kullanımından kaynaklanan çevre kirliliği ile mücadele etmek amacıyla birçok sanayi ülkesinde sürdürülebilir enerji kaynaklarına dayalı politikaların geliştirilmesine öncelik verilmiştir.
- E) Birçok sanayi ülkesi, sürdürülebilir enerji kaynaklarına dayalı politikaların geliştirilmesine öncelik vererek fosil yakıtların aşırı kullanımından kaynaklanan çevre kirliliği ile mücadele etmektedir.

48

Bilim insanlarının atmosferden karbondioksidi emmek için geliştirdiği sıvı çözücülerin çevreyi temizleme konusunda yararlı olduğu kanıtlanmıştır.

- A) Scientists have proved that liquid solvents developed to absorb carbon dioxide from the atmosphere is helpful in cleaning up the environment.
- B) Absorbing carbon dioxide from the atmosphere, liquid solvents developed by scientists have been proved to be helpful in cleaning up the environment.
- C) Liquid solvents that scientists developed to absorb carbon dioxide from the atmosphere have been proved to be helpful in cleaning up the environment.
- D) Scientists developing liquid solvents have proved that absorbing carbon dioxide from the atmosphere is helpful in cleaning up the environment.
- E) Liquid solvents developed by scientists to clean up the environment have been proved to be helpful in absorbing carbon dioxide from the atmosphere.

49

Dünya üzerinde iki milyondan fazla canlı türü bulunmaktadır ve her bir hayatta kalmak için farklı adaptasyonlar geliştirdiğinden birbiri ile tamamen aynı hiçbir tür yoktur.

- A) There are more than two million living species on Earth which are not exactly the same with one another because of the different adaptations each kind has developed to survive.
- B) There are more than two million living species on Earth, and there is no kind exactly the same with one another as each one has developed different adaptations to survive.
- C) Because there are more than two million living species on Earth and each of them has developed different adaptations for survival, there is not a single kind exactly the same with one another.
- D) In more than two million living species on Earth, there is no kind exactly the same with one another as each one has developed different adaptations for survival.
- E) More than two million living species on Earth have developed different adaptations to survive; thus, there is not a single kind exactly the same with one another.

50

Yapay zekâ teknolojisi bazı çalışanlar için üretkenliği artırmayı vaat eden yeni bir araçken gelişmiş ülkelerdeki çoğu çalışan, mesleklerinin önemini yitirdiğine tanık olabilir.

- A) For some workers, the artificial intelligence technology is a new tool that is promising for raising productivity, yet most workers in developed countries may witness that their professions have lost their significance.
- B) While the artificial intelligence technology is a new tool that promises to raise productivity for some workers, most workers in developed countries may witness that their professions have lost their significance.
- C) Some workers view the artificial intelligence technology as a new tool that is promising for the enhancement of productivity, but most workers in developed countries may witness that their professions have lost their significance.
- D) Although many workers in developed countries may witness that their professions have lost their significance due to the artificial intelligence technology, it is a new tool promising to enhance productivity for some workers.
- E) Whereas the artificial intelligence technology as a new tool promises to raise productivity for some workers, there could be many workers in developed countries who may witness that their professions have lost their significance.

51

Mimarlık genel olarak şehir tasarımı konularını kapsasa da şehir planlaması, mühendislik, peyzaj ve yapı işlerinin temel doğası gereği 20. yüzyılda bağımsız bir meslek hâline gelmiştir.

- A) Architecture generally covers the issues of city design; however, the basic nature of engineering, landscape, and construction work made urban planning an independent profession in the 20th century.
- B) Urban planning, which evolved into an independent profession in the 20th century due to the basic nature of engineering, landscape, and construction work, mainly includes the issues of city design as does architecture.
- C) While architecture mainly involves the issues of city design, urban planning emerged as an independent profession in the 20th century in line with the basic nature of engineering, landscape, and construction work.
- D) Although architecture generally includes the issues of city design, urban planning became an independent profession in the 20th century due to the basic nature of engineering, landscape, and construction work.
- E) Even though the issues of city design are generally included in architecture, urban planning was transformed into an independent profession in the 20th century owing to the basic nature of engineering, landscape, and construction work.

52

Kimyasal biyoloji alanı, organik maddelerin yalnızca canlı organizmalar tarafından üretilebileceği inancını reddeden Alman kimyager Friedrich Wöhler'in devrim yaratan çalışmalarıyla ortaya çıkmıştır.

- A) The field of chemical biology emerged with the German chemist Friedrich Wöhler whose revolutionary works defied the belief that organic substances could only be produced by living organisms.
- B) Thanks to the revolutionary works of the German chemist Friedrich Wöhler, who defied the belief that organic substances could only be produced by living organisms, the field of chemical biology emerged.
- C) The emergence of the German chemist Friedrich Wöhler's works that defied the belief that organic substances could only be produced by living organisms revolutionised the field of chemical biology.
- D) The field of chemical biology was revolutionised with the emergence of the works of the German chemist Friedrich Wöhler, who defied the belief that organic substances could only be produced by living organisms.
- E) The field of chemical biology emerged with the revolutionary works of the German chemist Friedrich Wöhler, who defied the belief that organic substances could only be produced by living organisms.

53

Atom saatleri dünyadaki en doğru kronometrelerdir ve zamanı ölçmek için atomlar tarafından daima oldukça kesin bir ışık frekansı şeklinde emilen ve yayılan enerjiyi kullanırlar.

- A) Atomic clocks are the most accurate timekeepers in the world, and they use the energy absorbed and emitted by atoms, which is always in the form of a very precise frequency of light, to measure time.
- B) Atomic clocks, which are the most accurate timekeepers in the world, use the energy absorbed and emitted by atoms to measure time and this energy is always in the form of a very precise frequency of light.
- C) Atomic clocks are the most accurate timekeepers in the world, and while measuring time they use the energy that atoms absorb and emit in the form of a very precise frequency of light.
- D) The energy absorbed and emitted by atoms is always in the form of a very precise frequency of light, and atomic clocks use this energy to measure time as the most accurate timekeepers in the world.
- E) Being the most accurate timekeepers in the world, atomic clocks measure time by using the energy absorbed and emitted by atoms, which is always in the form of a very precise frequency of light.

54

Humans have long relied on nature for building materials – creating simple homes from living or once-living materials such as grass, wood, reeds, bamboo, and animal skins. These homes often followed the aesthetics of the natural landscape. Today, bioarchitects build on this tradition by using sustainable, natural materials. They may also mimic nature's form and function to achieve greater beauty and ecological value, regardless of whether the structure is built with natural materials. --- The end results take on many forms, including massive apartment complexes, towering office buildings, grand museums, and humble homes.

- A) This modern approach takes nature-inspired building to new heights by re-purposing discarded materials and even relying on living organisms to supply power.
- B) Earthwork mounds with living plants on the roofs sheltered settlers from wind and temperature extremes, while providing grazing for farm animals.
- C) Bioarchitecture is rooted in the ancient human practice of building dwellings from natural materials, resulting in structures that blend into their surroundings.
- D) To meet housing, energy, and sustainability goals, the methods and materials of bioarchitectural design must become more widely available.
- E) To make a real impact on the quality of our lives and on the environment, bioarchitecture must become affordable so that more people can embrace it.

55

Nanobiomedicine refers to the biomedical applications of natural or synthetic nanomaterials, biological nanodevices or nanomachines. This is an emerging scientific discipline which has great potential for imaging, early diagnosis, and targeted therapy of numerous diseases that are hard to control such as cancer. Nanomaterials may be the most important tools which have greatly improved the advancement of the biomedical areas. The most commonly used nanomaterials for biomedical applications include graphene-based nanoparticles, magnetic nanoparticles, gold nanostructures, etc. --- To illustrate, small nanoparticles have the ability to transport through biological barriers and, thus, can deliver the drug to the target site.

- A) In hybrid nanoparticles, the sizes of the hybrids significantly increase, compared with those of the individual nanoparticles.
- B) There are important parameters for these nanoparticles used in biomedical areas, one of them is having suitable particle size.
- C) In recent years, nanocomposites containing different types of nanoparticles have been investigated in detail since they are multifunctional.
- D) The biomedical applications of nanomaterials include reducing drug resistance, targeted drug delivery, and controlled drug release.
- E) The great challenge of nanohybrid materials is that the functions of each nanoparticle may be reduced after being united.

56

Fungi are a hidden earthly dimension scientists only now learning how to see. --- For example, where plants have cell walls made of cellulose, fungi have chitin, a type of fibre also found in the exoskeletons of insects. And fungi are heterotrophs, that is, capable of eating other organisms, often breaking down wood and dead plant matter by releasing and reabsorbing enzymes. Without fungi, dead plants and animals would pile up on forest floors, and most trees would struggle to find the nutrients they need to survive.

- A) They thrive in soil and grow edible stalks like plants, but many of their characteristics are distinctly unplantlike.
- B) Our world has become more connected than ever, and fungi have embarked on countless global journeys.
- C) Climate change is allowing these organisms to thrive in ecosystems that were once too cold and dry.
- D) Fungi have evolved to live in specific environments, sometimes in partnership with just one other species.
- E) Their reproductive traits make fungi uniquely adaptable, with climates and landscapes changing at a record pace.

57

Most historians consider Galileo Galilei as the first scientist of the Scientific Revolution. --- The observation that all bodies fall at the same speed in a vacuum is just one of Galileo's ideas that led to the laws of motion and eventually to relativity theory. Galileo also contributed to the study of mathematical infinity. His influence comes not only through his popular books about the solar system, kinematics, and materials, but also as a result of his inventions.

- A) His greatest fame is for discoveries in astronomy, but his influence on physics is pervasive.
- B) He was judged for his astronomical discoveries and asked to deny them.
- C) He built his first telescope in 1609 and eventually obtained a magnification of about 30 power.
- D) He was known to repeat experiments and analyses after they were initially conducted by earlier scientists.
- E) His observations on the swinging time of lamps in the Cathedral of Pisa led to the creation of the pendulum-driven clock.

58

Our planet spins like a toy that turns round and round when its handle is moved up and down, during its long journey around the Sun. Rather than revolving about a vertical axis, however, the Earth has always been spinning about an axis that is tilted at 23.44°. The amount of tilt is never constant, and displays natural short-term and long-term cycles.

— And this is happening right now, on an extraordinary scale, due to us. As global heating drives the melting of the polar ice sheets, it causes enormous volumes of water to flow into the oceans. In a recent paper, scientists have revealed that this redistribution of mass is very slightly modifying the world's tilt.

- A) In addition to modifying tilt, this movement of mass water has also slowed the planet's rotation.
- B) The Earth's tilt can also be changed by shifting huge amounts of mass around the planet.
- C) Scientists have found that using underground water impacts the Earth's tilt more than melting polar caps.
- D) In itself, polar melting is not sufficient to account for all of the tilt change.
- E) A tiny change in the Earth's rotation is not going to have an impact on the climate change.

59

Although traditional clockwork clocks dominated for several centuries, it is quite likely that people do not have a single one in their home today. This is due to a discovery that was made early in the 20th century concerning a common mineral called 'quartz'. This discovery made it possible to construct timepieces that were at least ten times more accurate than the best traditional clocks. — This was because the electronic devices of those days were bulky and unreliable, and it was several decades before a later generation of miniaturised electronics made quartz clocks and watches a viable proposition.

- A) The first mechanical clocks, with bells but no hands or dials, appeared in northern Italy and Germany.
- B) Timepieces were gradually refined and improved with greater precision and greater practicality.
- C) A major leap forward in accuracy came in the latter part of the 17th century, with the introduction of pendulum clocks.
- D) The first such quartz clock was built in 1927, but it did not create an immediate revolution as expected.
- E) They were the first devices to actually bear the name 'clock' deriving from the Latin word *clocca*, which means 'bell'.

60

(I) Defining the problem is the first and most critical step of problem analysis. (II) To best approach a solution, the problem must be well-understood and the guidelines or design considerations for a project must be clear. (III) In the creation of a new automobile, for example, the engineers must know if they should design for fuel economy or for brute power. (IV) Once a general design or technology is selected, the work is sub-divided and various team members assume specific responsibilities. (V) Many questions like this arise in every engineering project, and they must all be answered at the very beginning if the engineers are to work efficiently towards a solution.

A) I B) II C) III D) IV E) V

61

(I) Designed to drive across alien terrain, robotic rovers are mobile science labs that hunt out interesting sites and conduct on-the-spot investigations. (II) With their own power supply, they are armed with scientific instruments, including cameras and rock analysis tools. (III) Mars is the only planet that robotic rovers have explored, with four rovers having successfully visited it. (IV) Ground controllers back on Earth decide where the rovers should go and what they should do. (V) Because of the extended distance between the two, the directions take a few minutes to get through, and the collected data is relayed directly to Earth.

A) I B) II C) III D) IV E) V

62

(I) The first scientific society founded in the capital of Prussia was the Royal Society of Sciences in 1700 by Gottfried Wilhelm Leibniz under the patronage of the elector of Brandenburg, Frederick III. (II) The society was hampered by what was to become a permanent problem in 18th-century Berlin science: conflict between its French and German members. (III) Frederick hoped to make Prussia a centre of learning, an impulse that also led to the founding of the University of Halle and Prussia's shift to the Gregorian calendar. (IV) The society received a monopoly on the production, importation, and sale of almanacs and calendars in Prussia. (V) It was the first scientific society to be funded this way, setting an influential precedent.

A) I B) II C) III D) IV E) V

63

(I) For most of us, time is experienced as a linear sequence of events that flow from the present into the past, while possible futures are laid out before us. (II) However, some cultures in different parts of the world find a cyclical view of time more useful. (III) For instance, nature watchers tend to be more attuned to circular time, where life and its rhythms are shaped by the flow of cycles and seasons. (IV) This apparent circular flow is what gives organisms a chance to return, reappraise and build on experience in order to pass adaptive traits along a spiral of life. (V) While some of the greatest minds have contemplated the concept of time for over a century, their theories do not always match up to our everyday experience of time.

A) I B) II C) III D) IV E) V

64

(I) The genome of an organism consists of thousands of genes, and this entire genome must be replicated as new cells are produced. (II) However, this process is not perfect, and a few errors, known as mutations, are likely to occur each time the genome is replicated. (III) How cells control gene expression in ways that enable a complex organism to develop and function is a major focus of current biological research. (IV) They occur spontaneously; they can also be induced by outside factors, including chemicals and radiation. (V) Most of them are either harmful or have no effect, but occasionally a mutation improves the functioning of the organism under the environmental conditions it encounters.

A) I B) II C) III D) IV E) V

65

(I) The ways in which certain animals and plants interact have evolved in some cases to make them interdependent for nutrition, respiration, reproduction, or other aspects of survival. (II) However, ecology represents the organised body of knowledge that deals with the interactions between living organisms and their non-living environments. (III) A major example of animal-plant interactions involves the continual processes of photosynthesis and cellular respiration. (IV) In these processes, green plants are classified as 'ecological producers', having the unique ability, by photosynthesis, to take carbon dioxide and incorporate it into organic molecules. (V) Animals, on the other hand, are classified as 'consumers', taking the products of photosynthesis and chemically breaking them down at the cellular level to produce energy for life activities.

A) I B) II C) III D) IV E) V

Over the past three decades, David Tilman has set up thousands of field experiments 70 km outside of Minneapolis, US, probing some of the most fundamental questions about prairie ecosystems, which are plain areas covered in grass. The ecologist never imagined he would undertake the considerably more practical task of developing new climate-friendly crops for biofuels – that is, until 2005, when he realised he had done it by pure chance, as part of a long-term ecological study. On one 11 m square plot was a healthy stand of switchgrass, an abundantly growing perennial (a plant that persists for several years) that the US government is promoting as an alternative to corn. Nearby was a plot of switchgrass mixed with 15 native perennial grasses, and they were analysed by Tilman and his colleagues because different species occupy different ecosystem niches to perform different functions which can boost biodiversity and replenish depleted soils. Neither plot received irrigation or fertiliser. Yet, when the researchers analysed 12 years' worth of data, they surprisingly found out that the mixed plots delivered more than twice the yearly biomass per hectare, suggesting a potentially much more efficient biofuel source with a much smaller carbon footprint.

66

Which of the following can be said about Tilman?

- A)** He has worked on thousands of experiments about energy sources.
- B)** He collaborated with the US government to promote switchgrass as an alternative to corn.
- C)** He found out an alternative biofuel crop just by coincidence.
- D)** He is an ecologist aiming to raise awareness about climate-friendly agriculture.
- E)** He failed in developing an ecologically-sound grass species despite 12 years' worth of data.

67

What can be understood from the data collected by Tilman and his colleagues?

- A)** Mixing different native grasses in with switchgrass provides more biomass.
- B)** Switchgrass on its own is able to replenish depleted soils.
- C)** Plots which were given fertiliser grew far more than those which were not given any.
- D)** Mixed grasses were beneficial only when they were ecologically and functionally similar.
- E)** Plots including mixed native grasses may have higher levels of carbon footprint.

68

Which could be understood from the passage?

- A)** For an ecological study to be seen as successful, it needs to deliver unpredictable outcomes.
- B)** Ecologists need to irrigate and fertilise the plot they are going to study on as the first step.
- C)** Researchers should study with vegetation which are mixed as it will be more financially feasible.
- D)** The study conducted by Tilman and his colleagues yielded unexpected and promising results.
- E)** Switchgrass is the most commonly used source of biofuel in the US.

The idea of satellite-aided search and rescue can be traced back to a tragic accident that took place in 1970, when a plane carrying two US congressmen crashed in a remote region of Alaska. Despite a massive search and rescue work, no trace of the missing aircraft or its passengers has ever been found. In reaction to this tragedy, the US Congress mandated that all aircraft operated in the United States carry an Emergency Locator Transmitter (ELT). This device was designed to automatically activate after a crash and transmit a homing signal. Since space technology was still in its infancy, the frequency chosen for ELT transmissions was 121.5 MHz, the frequency used by international aircraft for distress signals. This system worked, but it had many technical limitations. After several years, these limitations began to outweigh the benefits. In addition, space technology had improved to the point that a satellite-aided search and rescue system had become practical. The space-based system would operate on a frequency (406 MHz) reserved exclusively for emergency radio beacons, it would have a digital signal that uniquely identified each registered beacon, and it would provide global search and rescue coverage.

69

Which of the following is true of the aircraft tragedy mentioned in the passage?

- A) It was an unfortunate event for the passengers as the US government failed to put enough effort to find the wreckage.
- B) It happened because the plane had not been fitted with the basic version of ELT.
- C) It marked a turning point in technology-enhanced search and rescue in aircraft history.
- D) It caused the US Congress to pass a law to overcome the limitations of ELT.
- E) It involved some US statesmen who were working on safety equipment in aircraft.

70

According to the passage, the device called 'ELT'

- .
- A) was missing in the aircraft that got lost in a tragic accident although it was required by law
 - B) sometimes failed to work effectively as manual start up was essential to send signals
 - C) was intended to send signals from time to time to spot the location of aircraft while in flight
 - D) was invented in a period when space technology development became advanced
 - E) proved less useful over time as it had more limitations than benefits

71

What is the primary purpose of the author?

- A) To give detailed information about a serious aircraft accident that occurred in 1970
- B) To highlight the contributions of the US congress to the enhancement of aircraft safety
- C) To exemplify the benefits and drawbacks of the Emergency Locator Transmitter
- D) To explain how the satellite-aided search and rescue system came into being
- E) To draw particular attention to the frequency on which the space-based system operates

Science is a tool we use to understand the world and is subject to all the shortcomings of the human mind. Looking at the past, it appears that science has progressed in a rational and linear manner. However, if science was rational, it would progress from one stage to another in a single series of steps, in a linear fashion. Discovery A leads to B, to C, and so on, and we therefore end up with an understanding of atoms, or DNA, or the sequence of human genome. And certainly, there is plenty of apparent evidence for this phenomenon of linear advancement. However, this perspective is misleading; science is not linear and is not rational. If we could take a kind of general view of the history of scientific thought, we would be at once struck by its discontinuity, its abrupt changes of tempo and rhythm. For example, Archimedes discovered buoyancy with instinctive feelings, rather than rational thought, when he took a bath and noticed something, then he ran through the streets exclaiming "Eureka!" The American philosopher of science Thomas Kuhn reviewed scientific discoveries and concluded that knowledge does not progress in a rational and linear process, with small discoveries gathering evidence for new theories. Rather, he proposed that they move suddenly, with rapid developments of new concepts. We can say there is only one principle that can be defended under all circumstances and in all stages of human development. It is the principle: 'anything goes'. Therefore, our imagination in science should not be limited by preconceived ideas. What is important in science is problem-solving, not conforming to established modes of thought.

72

According to the passage, Archimedes' discovery exemplifies ----.

- A) the progress of science at a constant rate over time
- B) the necessity of disciplined hard work to achieve success
- C) the importance of intuition, which is a non-rational process
- D) the critical role of human imagination in science
- E) the major shortcomings of the human mind

73

Which of the following is implied in the passage?

- A) It is completely misleading to say that science does not develop by precise rational steps.
- B) The principle 'anything goes' fails to fit in all the branches of science.
- C) All scientific work must connect with the previous advances and proceed by adding a novel perspective.
- D) Great discoveries may not always result from just logical thought and gradual progression.
- E) Scientists should share their discoveries with others so that science can advance in a holistic way.

74

It can be understood from the passage that the principle of 'anything goes' can be associated with ----.

- A) the liberation of imagination in science from conventional norms
- B) the inevitability of fixed rules for scientific developments
- C) the exciting side of scientific discoveries
- D) the acceptance of linear advancement
- E) the requirement of concrete evidence for new theories

Anders Celsius was a Swedish astronomer, physicist, and mathematician who introduced the Celsius temperature scale that is used today by scientists in most countries. He was born in Uppsala, Sweden, a city that has produced six Nobel Prize winners. His most famous contribution falls in the area of temperature, and the one he is remembered the most for is the creation of the Celsius temperature scale. In 1742, he presented a paper to the Swedish Academy of Sciences to demonstrate his observations that all thermometers should be made on a fixed scale of 100 divisions (centigrade), based on two points: 0 degrees for boiling water and 100 degrees for freezing water. He presented his arguments on the inaccuracies of existing scales and calibration methods and correctly presented the influence of air pressure on the boiling point of water. After his death, the scale that he designed was reversed, giving rise to the existing 0° for freezing and 100° for boiling water. For years, Celsius thermometers were referred to as 'Centigrade' thermometers. However, in 1948, the Ninth General Conference of Weights and Measures ruled that 'degrees centigrade' would be referred to as 'degrees Celsius' in his honour.

75

According to the passage, Anders Celsius ----.

- A) suggested changing the measurements he originally offered for boiling and freezing water later in his life
- B) was largely inspired by scientists who received prizes for their major contributions to scholarly discussions
- C) put forward strong arguments to challenge the idea that air pressure can change the boiling point of water
- D) combined his expertise in astronomy, physics, and mathematics to come up with the Centigrade scale
- E) offered some key arguments in a study that has deeply impacted how thermometers operate today

76

Which of the following can be understood about the original scale offered by Celsius?

- A) It suggested using different methods for boiling water under pressure and measuring its temperature.
- B) It was based on the idea of identifying multiple points for both boiling and freezing water.
- C) It was called 'degrees centigrade' by the Swedish Academy of Sciences because it used a fixed scale of 100 divisions.
- D) It was built upon the knowledge that Celsius derived from the shortcomings of earlier scales and calibration methods.
- E) It was subjected to a reverse in the way it measures temperature in 1948.

77

What is the main idea of this passage?

- A) With the Ninth General Conference of Weights and Measures, Celsius' substantial contributions to measuring temperature have been publicised.
- B) Celsius devoted his whole life to pinpointing serious mistakes and problems in measurements used across the world.
- C) Celsius made it possible to measure the temperature of boiling and freezing water, yet the value of his work had hardly been recognised before his death.
- D) The Swedish scientist Celsius successfully identified problems in measuring temperature and shaped today's understanding of it.
- E) Despite studying mainly on physics, Celsius made outstanding contributions to various scholarly areas during his lifetime.

For most of human history, technology has resulted from a combination of trial and error. People discovered procedures by chance that led to new products or made old processes work better by trying variations and refinements. The modern age, with its competitive globalised economy, has a number of mechanisms available through which new techniques can spread rapidly, but none of these existed in classical antiquity. There is no question that all societies contain innovative individuals who are eager to challenge tradition and looking for a better way to make things and thus improve their life. Yet, the rate at which this type of advancement took place before 1750 was extremely slow by our standards. One reason for this was that even when improved techniques were tried and found to be feasible, they often disappeared because their owners kept them secret or the new technique simply was too localised and disappeared when its inventors died, before it could become widespread. In addition, most societies of the past were far more conservative and tradition-bound than those of today. Respect for the knowledge of past generations was prevalent in most societies, and an act of invention was always and everywhere an act of rebellion. This technological conservatism, however rational it may have seemed at the time, ensured that many new ideas remained just ideas.

78

It is stated in the passage that technological improvements ---.

- A) have faced continuous interventions in globalised countries due to competitions in the field
- B) enjoyed a peak in 1750 due to the efforts carried out by innovative people around the world
- C) have taken place in a cycle of experiment and failure throughout history
- D) have changed the cultural dynamics of societies besides contributing to their economic growth
- E) were historically based on the improvements of old processes due to the small number of innovative people

79

Which of the following is not mentioned about the reasons for the delay in scientific advances in the past?

- A) Ancient societies were more conventional and old-fashioned than modern societies.
- B) Although new techniques were available, they could not gain recognition as their owners did not publicise them.
- C) New techniques were developed in a limited area where the rest of the world was unaware of such discoveries.
- D) Cultural norms hindered the abandonment of old methods and the introduction of new ones.
- E) There was a lot of competition among innovative individuals, which postponed the agreements on scientific truths.

80

What could be the best title for this passage?

- A) Why Technology Developed So Slowly in the Past
- B) How Previous Technological Advances Contributed to Modern Science
- C) From Trial and Error to Mastery: Modern Technology
- D) The Scientific Breakthroughs That Took Place in Antiquity
- E) The Significance of Innovative Spirits in the Advancement of Science

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ANSWER KEY

1 B	21 E	41 A	61 C
2 B	22 D	42 E	62 B
3 C	23 C	43 B	63 E
4 B	24 B	44 A	64 C
5 A	25 A	45 A	65 B
6 C	26 B	46 C	66 C
7 C	27 A	47 A	67 A
8 E	28 A	48 C	68 D
9 C	29 D	49 B	69 C
10 D	30 B	50 B	70 E
11 A	31 B	51 D	71 D
12 A	32 A	52 E	72 C
13 C	33 D	53 A	73 D
14 C	34 B	54 A	74 A
15 D	35 A	55 B	75 E
16 A	36 E	56 A	76 D
17 A	37 C	57 A	77 D
18 B	38 A	58 B	78 C
19 C	39 A	59 D	79 E
20 A	40 D	60 D	80 A