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請按照題目順序在答案卷填寫答案

I. Please choose the best answer to each question based on the following passages (20%) 閱讀測驗每題 2 分，共 10 題。

Atmospheric pressure can support a column of water up to 10 meters high. But plants can move water much higher: the sequoia tree can pump water to its very top, more than 100 meters above the ground. Until the end of the nineteenth century, the movement of water in trees and other tall plants was a mystery. Some botanists hypothesized that the living cells of plants acted as pumps. But many experiments demonstrated that the stems of plants in which all the cells are killed can still move water to appreciable heights. Other explanations for the movement of water in plants have been based on root pressure, a push on the water from the roots at the bottom of the plant. But root pressure is not nearly great enough to push water to the tops of tall trees. Furthermore, the conifers, which are among the tallest trees, have unusually low root pressures. If water is not pumped to the top of a tall tree, and if it is not pushed to the top of a tall tree, then we may ask: How does it get there? According to the currently accepted cohesion-tension theory, water is pulled there. The pull on a rising column of water in a plant results from the evaporation of water at the top of the plant. As water is lost from the surface of the leaves, a negative pressure, or tension, is created. The vaporated water is replaced by water moving from inside the plant in unbroken columns that extend from the top of a plant to its roots. The same forces that create surface tension in any sample of water are responsible for the maintenance of these unbroken columns of water. When water is confined in tubes of very small bore, the forces of cohesion (the attraction between water molecules) are so great that the strength of a column of water compares with the strength of a steel wire of the same diameter. This cohesive strength permits columns of water to be pulled to great heights without being broken. (From TOEFL readings and Chrispeels, M. & Maurel, C. (1994). Aquaporins: the molecular basis of facilitated water movement through living plant cells? *Plant Physiology* 105, 9-13)

1. How many theories does the author mention?
(A) One
(B) Two
(C) Three
(D) Four

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2. The passage answers which of the following questions?

(A) What is the effect of atmospheric pressure on foliage?

(B) When do dead cells harm plant growth?

(C) How does water get to the tops of trees?

(D) Why is root pressure weak?

3. How do botanists know that root pressure is not the only force that moves water in plants?

(A) Some very tall trees have weak root pressure.

(B) Root pressures decrease in winter.

(C) Plants can live after their roots die.

(D) Water in a plant's roots is not connected to water in its stem.

4. Which of the following statements does the passage support?

(A) Water is pushed to the tops of trees.

(B) Botanists have proven that living cells act as pumps.

(C) Atmospheric pressure draws water to the tops of tall trees.

(D) Botanists have changed their theories of how water moves in plants.

5. According to the passage, why does water travel through plants in unbroken columns?

(A) Root pressure moves the water very rapidly.

(B) The attraction between water molecules is strong.

(C) The living cells of plants push the water molecules together.

(D) Atmospheric pressure supports the columns.

Because the low latitudes of the Earth, the areas near the equator, receive more heat than the latitudes near the poles, and because the nature of the heat is to expand and move, heat is transported from the tropics to the middle and high latitudes. Some of this heat is moved by winds and some by ocean currents, and some gets stored in the atmosphere in the form of latent heat. The term "latent heat" refers to the energy that has to be used to convert liquid water to water vapor. We know that if we warm a pan of water on a stove, it will evaporate, or turn into vapor, faster than if it is allowed to sit at room temperature. We also know that if we hang wet clothes outside in the summertime they will dry faster than in winter, when temperatures are colder. The energy used in both cases to change liquid water to water vapor is supplied by

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heat-supplied by the stove in the first case and by the sun in the latter case. This energy is not lost. It is stored in water vapor in the atmosphere as latent heat. Eventually, the water stored as vapor in the atmosphere will condense to liquid again, and the energy will be released to the atmosphere.

In the atmosphere, a large portion of the sun's incoming energy is used to evaporate water, primarily in the tropical oceans. Scientists have tried to quantify this proportion of the sun's energy. By analyzing temperature, water vapor, and wind data around the globe, they have estimated the quantity to be about 90 watts per square meter, or nearly 30 percent of the sun's energy. Once this latent heat is stored within the atmosphere, it can be transported, primarily to higher latitudes, by prevailing, large-scale winds. Or it can be transported vertically to higher levels in the atmosphere, where it forms clouds and subsequent storms, which then release the energy back to the atmosphere. (From TOEFL readings and U.S. Geological survey: the water cycle, http://ga.water.usgs.gov/edu/watercyclesummary.html)

6. The passage mainly discusses how heat
(A) is transformed and transported in the Earth's atmosphere
(B) is transported by ocean currents
(C) can be measured and analyzed by scientists
(D) moves about the Earth's equator

7. The passage mentions that the tropics differ from the Earth's polar regions in which of the following ways?
(A) The height of cloud formation in the atmosphere
(B) The amount of heat they receive from the sun
(C) The strength of their large-scale winds
(D) The strength of their oceanic currents

8. According to the passage, most ocean water evaporation occurs especially
(A) around the higher latitudes
(B) in the tropics
(C) because of large-scale winds
(D) because of strong ocean currents

9. According to the passage, 30 percent of the sun's incoming energy
(A) is stored in clouds in the lower latitudes
(B) is transported by ocean currents
(C) never leaves the upper atmosphere
(D) gets stored as latent heat

(背面仍有題目,請繼續作答)

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10. All of the following words are defined in the passage EXCEPT
(A) low latitude
(B) latent heat
(C) evaporate
(D) atmosphere

II. Please reassemble the sentences into unified and coherent passages. The answer could be for example, ACEBDGIFH. (20%) 組裝短文，順序全對才計分，每題5分，共4題。

1. (From Spiro, J. (2005). Introduction: Sleep. *Nature* 437, 1253)
(A) the high level of brain activity during REM sleep created a serious challenge to the prevailing dogma — that we sleep simply to provide rest —
(B) things are more complex than they seem at first glance
(C) this is a sleep state marked by intense brain activity, rapid bursts of eye movement and vivid dreaming
(D) with the discovery of rapid eye movement (REM) sleep
(E) although it is often true in biology that
(F) it is especially accurate for sleep
(G) this became apparent about 50 years ago
(H) and raised a host of largely unanswered questions about the function of sleep

2. (From Whitehouse, A. & Bishop, D. (2008). Cerebral dominance for language function in adults with specific language impairment or autism. *Brain* 131(12), 3193-3200)
(A) play a role in the etiology of SLI (Bishop, 2002)
(B) in the development of language
(C) although the disorder is identified on the basis of difficulties in early language development, as children grow older
(D) there is little understanding of the neurobiological phenotype
(E) literacy problems usually become apparent (Bishop and Snowling, 2004). While it is clear that genetic factors
(F) specific language impairment (SLI) is recognized when there is significant delay
(G) that cannot be attributed to low intelligence, hearing impairment or limited educational opportunities

3. (From Mermillod, M., Vermeulen, N., Lundqvist, D., & Niedenthal, P. (2009). Neural computation as a tool to differentiate perceptual from emotional processes:

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The case of anger superiority effect. *Cognition*, article in press)

(A) by the network
(B) but used also in the major extant papers on this topic, our first simulation showed that
(C) employing the stimuli used by Juth et al. (2005)
(D) angry as opposed to happy, in a crowd of neutral faces
(E) happy faces were more easily categorized
(F) in this work, we examined the perceptual factors at play in the efficiency of detecting a face
(G) than were angry and neutral faces

4. (From Bowler, P. (2009). Darwin's originality. *Science*, 323(5911): 223-226)

(A) when first proposed in 1859, however,
(B) Charles Darwin's theory of natural selection
(C) including his studies of biogeography and animal breeding
(D) has been hailed as one of the most innovative contributions to modern science
(E) this article identifies those aspects of Darwin's work that led him to develop this revolutionary theory
(F) and his recognition of the role played by the struggle for existence
(G) it was widely rejected by his contemporaries, even by those who accepted the general idea of evolution

III. Please translate the following Chinese sentences into English (20%) 中翻英 每題 5 分，共 4 題。

1. 語言是接觸各種文化與風俗的溝通橋樑，能擴展我們的視野，充實我們的生活。
2. 隨著環保意識抬頭，資源回收利用在台灣變得愈來愈普及，也可以說是全球運動。
3. 世界上六十億的人口中，每一張「臉」都是獨一無二，並且可以展現數以千種的表情。
4. 常吃蔬菜、全穀類食物和水果的人，比起肉食性的同輩 ，擁有較健康的血壓。

IV. Please write an essay for <u>at least 300 words</u> in responding to the following questions. (40%) 英文短文寫作

Some students want to pursuit graduate studies in their home country, while others desire to study abroad. In your opinion, which is a better choice for getting adequate training and for career planning? Please give specific reasons.