CHRT077

NAME:……..

LIVEWORKSHEETS

IELTS GRENOVA LET'S MAKE IT HAPPEN

READING PASSAGE

*You should spend about 20 minutes on **Questions 1-13**, which are based on Reading Passage below.*

ARE PLANTS INTELLIGENT?

In the 1973 book *The Secret Life of Plants*, Peter Tompkins and Christopher Bird reported that plants had feelings, could read human emotions and thoughts, and had a predilection for classical music. Their assertions generated an uproar among members of the scientific community, with many arguing that thinking and feeling require the presence of a brain and that nothing in a plant, internally or externally, even remotely resembles one. However, members of the reading public who believed that their plants thrived when dealt with affectionately were quick to give their support. Although much of the evidence in the Tompkins-Bird book has since been discredited, numerous articles and studies claiming that plants are more than insentient organisms have since been published.

A well-known experiment conducted by Monica Gagliano's team at the University of Western Australia and reported in the journal *Oecologia* is worth mentioning. For the test, the scientists selected the mimosa plant, which reactively folds its leaves as a natural protective adaptation when the plant perceives danger. They came up with an apparatus with a vertical rail, which potted mimosa plants could slide down before landing on a foam base, and then subjected a large number of plants to the shock of being dropped from a height of about 15 centimetres. The plants were not damaged in any way since the pots fell only a short distance onto a soft surface, but the shock was considerable enough to cause the plants' leaves to close. But Gagliano's team was testing for intelligence, so they were seeking more than a knee-jerk reaction from the plants; they wanted to determine if the plants would be able to recall their experience and even learn from it.

To test their hypothesis, they dropped the plants 60 times at intervals of a few seconds, with each series of 60 drops being repeated a total of seven times. The team observed that toward the end of the day, the plants' leaves stopped closing. This indicated that they had 'adjusted' to their experience and no longer perceived falling to be a threat. The plants were then left undisturbed for nearly a week before being again subjected to the test. This time, some of the mimosa plants did not fold their leaves at all in response to the drop, while others stopped closing their leaves after only a couple of drops. Gagliano reasoned that the plants had a recollection of what had happened in the prior experiment, and postulated they had something akin to memory. Gagliano's research, which was heavily publicised, was criticised for conflating 'learning' with 'adapting'. Fred Sack, a botanist at the University of British Columbia, suggested that the distinction was very clear; plants evolve, animals learn.

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Another study putting forward the idea that plants can 'think' focused on the way trees are able to organise themselves. Suzanne Simard, a forest ecologist at the University of British Columbia, discovered how trees in a forest arrange themselves in widely distributed networks in a manner that allows the trees to share resources and protect fellow trees. They injected the trees with a radioactive carbon and followed the flow of nutrients and chemical signals through the community with a Geiger counter. A diagram they made of these movements showed that the oldest trees served as hubs and had as many as 47 connections to other trees. The diagram, they said, looked like an airline route map. Through the networks, the trees may share information about gravity, moisture, light, pressure, volume, gases, salts, microbes and potential danger, and plants receiving the information may change the direction of their growth, restrain their growth, or pass on warnings to other plants.

Still, sceptics of plant intelligence find ammunition in the bizarre pseudoscientific experiments that abound, such as the one done on a carrot tied down to an examining table by the respected botanist and biologist Sir Jagandish Chandra Bose. Bose, after noting that a machine connected to the carrot registered 'twitches, starts and tremors', concluded, 'Thus can science reveal the feelings of even so stolid a vegetable as the carrot.' Even more provocative was the work of Cleve Backster, a former CIA operative turned lie detector instructor, who connected a polygraph machine to a leaf of the houseplant in his office. Backster found out that when he deliberately thought about setting the plant on fire, the machine registered a surge of activity. This led him to the conclusion that not only can plants think, but they can also read minds. In another experiment, he recruited five volunteers and instructed one of them to root up, stomp on, and destroy one of two plants in a room. Later, Backster allowed the volunteers to enter, one by one, and claimed that polygraph metre 'went wild' when the perpetrator entered the room, leading him to declare that the surviving plant had identified the killer.

Regardless of whether plants are insightful or merely responding to environmental stimuli in a more primitive manner, the experimental evidence supports the idea that plants, like animals, are capable of habituation. But does this mean plants have brains? Words such as *feel*, *perceive*, *learn*, and *remember* are typically used for creatures with brains, and supporters must show that a brain, along with its neurons and synapses, is not necessary for knowledge. Stefano Mancuso, a leading figure in the field of 'plant neurobiology', states that 'if you are a plant, having a brain is not an advantage', and therefore we should stop thinking in terms of brain responses when it comes to plant intelligence. Thus, adherents like Mancuso continue to conduct research in hopes of one day conclusively proving that other ways of processing stimuli and information, such as with special cells and cell networks, and electrical or chemical signals, are indeed clear indicators of some form of intelligence among plants.

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Questions 1-6

Look at the following statements (Questions 1-6) and the list of researchers below.

*Match each statement with the correct researcher, **A-E**.*

***NB** You may use any letter more than once.*

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1 Plant adaptation should not be confused with learning.

2 Trees position themselves to promote sharing and protection.

3 Plants can identify someone who had done a violent act.

4 Plants' recall of events in a previous experiment suggests some form of memory.

5 It is misleading to think of plant intelligence in terms of brains.

6 Plants can understand people's thoughts.

List of Researchers

A Suzanne Simard
B Cleve Backster
C Stefano Mancuso
D Monica Gagliano
E Fred Sack

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Questions 7-10

*Complete the summary using the list of words, **A-I**, below.*

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Testing for Intelligence in Plants

Monica Gagliano's team set out to test the intelligence of plants through their responses to danger. They chose the mimosa plant because it has developed an **7** ..... through which it counters threats by folding its leaves. The team tested this by pushing the plants down a **8** ..... The fall was not harmful, but the plants did fold their leaves when they were dropped.

However, Gagliano's team was focused on the question of intelligence, and did not want to simply test the plant's immediate **9** ..... This exercise was therefore repeated to see if the plants would recollect their **10** ..... and understand that it was not harmful. Eventually the plant's leaves stopped closing, allowing Gagliano to conclude that the plants had learned that this was not a danger.

A	stairs	**B**	injury	**C**	memory
D	adaptation	**E**	reaction	**F**	adoption
G	foam	**H**	experience	**I**	rail

Questions 11-13

Do the following statements agree with the information given in Reading Passage?

Write

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

11 The claims of Tompkins and Bird caused controversy among scientists.

12 Some readers who owned plants agreed with the ideas in the Tompkins-Bird book.

13 When connected to a polygraph machine, plants gave no response to a given stimulus.

Đáp án-Dịch nghĩa-Chú giải trang 469

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