I. The text below has incomplete sentences. Choose one word or phrase from each number that best completes the sentences!

The idea that red means stop and green means go has impacted our lives in more ways than just traffic signals. We (41) _____ from a young age that the color red means danger and green means it is okay to move forward. But why were those particular colors chosen for traffic lights in the first place? For something we have to look at every day, why couldn't they have been prettier colors like magenta and turquoise?

Well, it is important (42) _____ that before traffic lights for cars even became a thing, there were traffic signals for trains. (43) _____, railroad companies used red to mean stop, white to mean go, and green to mean caution. As you could imagine, train conductors ran into a few problems with white (44) _____ go. For instance, one train conductor mistook a bright star (45) _____ a white light and thought he was all clear. (46) _____ incidences like that, railway companies eventually moved green meaning go and it has been that way ever since.

(47) _____ red goes, it has always been a color (48) _____ danger, long before cars were even around. This most likely started because it is the color (49) _____ so it can be seen from a greater distance than other colors. As far as yellow goes, it (50) _____ drivers because it has a slightly shorter wavelength than red, but not as short as green.

Adapted from *http://www.rd .com/advice/travel/traffic-lights/*

Accessed 2 April 2017

41. _____
(A) are taught
(B) were taught
(C) were being taught
(D) had been taught
(E) have been taught

42. _____
(A) to know
(B) knowing
(C) to be known
(D) having known
(E) to have known

43. _____
(A) First
(B) Firstly
(C) At first
(D) In the first
(E) At the first

44. _____
(A) mean
(B) means
(C) meant
(D) meaning
(E) that is meant

45. _____
(A) for
(B) as
(C) to
(D) with
(E) about

46. _____
(A) Since
(B) When
(C) Although
(D) In spite of
(E) Because of

47. _____
(A) As far
(B) So far
(C) Far as
(D) As far as
(E) So far as

48. _____
(A) indicated that
(B) that indicates
(C) that is indicated
(D) indicates
(E) indicated

49. _____

(A) its wavelength is the longest
(B) with the longest wavelength
(C) having a longer wavelength
(D) has long wavelength
(E) its long wavelength

50. _____

(A) used to caution
(B) using it to caution
(C) was used to caution
(D) was using it to caution
(E) was used to cautioning

II. Study the passage and choose the best answer to the questions that follow!

Using a simple membrane extract from spinach leaves, researchers from the Technion-Israel Institute of Technology have developed bio-photo-electro-chemical (BPEC) cell that produces electricity and hydrogen from water using sunlight. The raw material of the device is water and its products are electric current, hydrogen, and oxygen.

The unique combination of a human-made BPEC cell and plant membranes, which absorb sunlight and **convert** it into a flow of electrons highly efficiently, paves the way for the development of new technologies for the creation of clean fuels from renewable sources: water and solar energy.

The BPEC cell developed by the researchers is based on the naturally occurring process of photosynthesis in plants, in which light drives electrons that produce storable chemical energetic molecules that are the fuels of all cells in the animal and plant worlds.

In order to utilize photosynthesis for producing electric current, the researchers added an iron-based-compound to the solution. **It** mediates the transfer of electrons from the biological membranes to the electrical circuit, enabling the creation of an electric current in the cell.

The electrical current can also be channeled to form hydrogen gas through the addition of electric power from a small photovoltaic cell that absorbs the excess light. This makes possible the conversion of solar energy into chemical energy that is stored as hydrogen gas formed inside the BPEC cell. **This energy** can be converted when necessary into heat and electricity by burning the hydrogen, in the same way hydrocarbon fuels are used.

However, unlike the combustion of hydrocarbon fuels, which emit greenhouse gases (carbon dioxide) into the atmosphere and pollute the environment, the product of hydrogen combustion is clean water. Therefore, this is a closed cycle that begins with water and ends with water, allowing the conversion and Storage of solar energy in hydrogen gas, which could be a clean and sustainable substitute for hydrocarbon fuel.

"The study is unique in that it combines leading experts from three different faculties, namely three disciplines: biology, chemistry and materials engineering," said Prof. Rothschild. "The combination of natural (leaves) and **artificial** (photovoltaic cell and electronic components), and the need to make these components communicate with each other, are complex engineering challenges that required us to join forces".

Taken from *https://www.sciencedaily.com/release/2016/09/160922085743.htm*
Accessed 30 March 2017

51. What is the topic of the text?

(A) a promising step into creating a renewable energy source
(B) making use of photosynthesis to create clean energy
(C) the combination of three disciplines in a research project
(D) clean renewable energy found in nature
(E) utilizing electric current to create renewable energy sources

52. The word "**convert**" in paragraph 2 is closest in meaning to ....

(A) exchange
(B) transform
(C) translate
(D) remove
(E) replace

53. Which of the following is true according to the text?
    (A) the researchers used animal membranes to develop BPEC cell
    (B) the researchers used cells of animal and plants to develop BPEC cell
    (C) the BPEC cell was created through electric current
    (D) the BPEC cell works like the cells of animal and plants
    (E) the BPEC cell uses sunlight to create fuels

54. What does the word "**it**" in paragraph 4 refer to?
    (A) the BPEC cell
    (B) photosynthesis
    (C) the solution
    (D) an iron-based compound
    (E) electric current

55. The text states all of the following, *except* ....
    (A) the electrical current can also be channeled to form hydrogen gas
    (B) a photovoltaic cell is used to absorb light
    (C) a BPEC cell stores chemical energy in the form of gas
    (D) the conversion of hydrogen and hydrocarbon occurs in the same manner
    (E) the burning of hydrogen is more efficient than that of hydrocarbon

56. Why does the author mention the "combustion of hydrocarbon fuels" in paragraph 6?
    (A) to explain the process of hydrogen combustion
    (B) to explain the process of hydrocarbon combustion
    (C) to emphasize the nonpolluting product of hydrogen combustion
    (D) to show similarities between hydrogen and hydrocarbon combustion
    (E) to explain the advantage of hydrocarbon

57. Where in the text does the author mention "the product of hydrogen combustion" ?
    (A) paragraph 3
    (B) paragraph 4
    (C) paragraph 5
    (D) paragraph 6
    (E) paragraph 7

58. What does the phrase "**this energy**" in paragraph 5 refer to?
    (A) hydrogen gas
    (B) solar energy
    (C) chemical energy
    (D) hydrocarbon fuels
    (E) a substitute

59. The word "**artificial**" in paragraph 7 is best replaced by ....
    (A) superficial
    (B) man-made
    (C) strange
    (D) foreign
    (E) ordinary

60. It can be inferred from the text that ....
    (A) hydrogen fuels emit greenhouse gases
    (B) the development of the BPEC cell required a lot of funds
    (C) hydrogen fuels pollute the environment
    (D) the development of the BPEC cell involved a large number of experts from different disciplines
    (E) hydrocarbon fuel could be sustainable energy