Reading Passage 2

You should spend about 20 minutes on ***Questions 14 – 27****, which are based on Reading Passage 2 below.*

The Floating Train

A In this fast-paced world, the fastest means of transportation that people can get access to is the airplane. The airplane lets people travel great distances in just a matter of hours instead of days or weeks. This has also become the most convenient way to traverse from one place to another in the 20th century. However, people do not often ride an airplane to reach a destination, as people travel only short distances most of the time. Passengers or commuters usually take other options when traveling. They drive a car, take a taxi, ride a bus or even take a train.

B Except for the plane, the alternative modes of transport mentioned above are just not speedy enough compared to the fast-changing needs of today's travelers. Because of this, a new method was introduced to reform the snail-paced land transportation system of the 21st century. This revolutionary development in transporting people is called the 'maglev', short for 'magnetic levitation.' The maglev is a kind of train powered by electromagnets. It floats over a guide track using the basic principles of magnets to replace the old steel wheels and train tracks.

C In science, the magnets have a force which can repel and attract each other because of electrons. This is the basic principle behind electromagnetic propulsion, the power that moves things, especially vehicles, in a forward direction. The electromagnet is a kind of magnet wrapped with copper wire. The wire connects the magnet to the electric current. The combination of the magnet and flow of electricity creates a magnetic field. The magnetic field helps to align the train parallel to the tracks. When the current ceases, the magnetic field disappears as well. Using this idea, a maglev monorail can move at a very high speed of 310 mph (500 kph), by which one can travel from France to Italy in just over two hours.

D In order for the maglev to travel at a tremendous rate, the train system employs three important elements. First is the large electrical power source that will supply the flow of electricity to the magnet. Second are the metal coils along the guideway. The metal coils are attached to the magnets and connected to the electric generator. Finally, large magnets are fastened to the underside of the train. These huge magnets make maglev trains stay in position, which is necessary for the magnets to be able to pull the train along the track.

E Since the maglev train is propelled by inconspicuous electrified coils on the undersurface, it does not need an engine – not the kind of engine that motorized conventional trains have.

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Electric locomotives, on the other hand, have noticeable engines since they are powered by electricity from external sources. The sources are comprised of overhead lines, a third rail or an on-board electricity storage device, such as a battery. Because of these very obvious power sources, electric trains are less classy than levitating trains.

F Due to the convenience and sophistication of maglev trains, countries, especially high-technology ones, are developing maglev train technology. Germany and Japan are the forerunners in this field. In Germany, engineers have developed an Electromagnetic Suspension (EMS) system called Transrapid. In this system, the underside of the train covers the track. Because of this design, the electromagnet causes the train to levitate for 1 cm. The train also uses an emergency battery power supply which can be used during urgent circumstances.

G On the other hand, engineers in Japan created the Electrodynamic Suspension (EDS) system, which functions through the repelling force of magnets. This system causes the train to rise 10 cm above the track. Though EDS has rubber wheels, the rubber wheels are only used to 'roll' the train until it reaches the liftoff speed, just like when airplanes are starting to lift off the ground. Nevertheless, these tires do not seem to be appealing for some because they make the train look just like ordinary ones. However, the Japanese engineers said that a maglev monorail will continue to run even if there is a power failure because of these rubber tires.

H High-speed levitating trains in the current fast-paced society offer alternative transportation methods that are capable of meeting modern people's needs. These trains give passengers a variety of options for fast and comfortable travel. However, since the maglev train is a high-technology system, one has to pay an enormous price to acquire it. Building and maintaining railroad systems as the largest form of passenger transportation is not easy; moreover, big investments and innovative engineers should be considered. But no matter what the cost is, more countries are still subscribing to the idea of the maglev. Thus, in the near future, we will see them speeding right before us.

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Questions 14 – 27

Questions 14 – 18

Answer the questions below.

Choose NO MORE THAN THREE WORDS from the passage for each answer.

Write your answers in boxes 14 – 18 on your answer sheet.

14 What is the fastest vehicle created in the 20th century?

15 What makes the maglev trains float?

16 How many hours will it take riding the maglev from France to Italy?

17 Which railway system allows trains to levitate 10 cm above the track?

18 Aside from huge capital, what is needed to run a railroad transport system?

Questions 19 – 23

Choose the correct letter, A, B, C or D.

Write the correct letter in boxes 19 – 23 on your answer sheet.

19 Unlike maglev trains, electric trains

- **A** do not make use of engines.
- **B** rely on external power sources.
- **C** run on electrified coils.
- **D** operate 24 hours a day to accommodate more passengers.

20 The design of the maglev train

- **A** is more elegant than that of electric trains.
- **B** is made by the Chinese.
- **C** is less than stylish.
- **D** features a noticeable power source.

21 EMS emergency batteries

- **A** are used to store electric power.
- **B** are placed underneath the train.
- **C** are designed by German engineers as a contingency plan.
- **D** can be used by high-technology trains and ordinary ones.

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22 The EDS uses rubber wheels because

A rubber wheels are appealing and make the maglev train similar to electric trains.
B the Japanese engineers believe that it would be helpful during a power shortage.
C the Japanese wants EDS to look different from Germany's Transrapid.
D the rubber wheels were excluded in the original design of EDS.

23 What people need in today's fast-paced society is

A an airplane that could cross seas and deserts in a short period of time.
B a railroad company that could produce high-technology trains.
C a highly sophisticated train that could meet the demands of the people.
D a floating train that has rolling tires and an emergency battery.

Questions 24 – 27

Complete the flow chart.

Choose NO MORE THAN TWO WORDS from the passage for each answer

Write your answers in boxes 24 – 27 on your answer sheet.

HOW THE MAGLEV MONORAIL WORKS

Wires ___24___ around the magnet are connected to the electric source.

➡ The power generator supplies the ___25___ that runs through the magnet.

➡ When the magnet is charged, a ___26___ is produced, keeping the train parallel to the tracks.

➡ The large ___27___ beneath the train make it stay on track.

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