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# PASSAGE 3

Questions 21-30

15 minutes

**GHI CHÚ**

Các câu hỏi dễ hơn cần ưu tiên trả lời đúng

★ Câu hỏi thông tin chi tiết: **22, 24, 26, 27, 29**

★ Câu hỏi tham chiếu: **23**

★ Câu hỏi từ vựng: **30**

At the end of the 1800's, Thomas Edison introduced the incandescent light bulb and changed the world. Remarkably, the incandescent bulb used today has changed little in over a hundred years. An incandescent light consists of a glass bulb filled with an inert gas such as argon. Inside the bulb, electricity passes through a metal filament. Because of resistance, the filament becomes so hot that it glows. But 95% of the energy goes to produce heat and is basically wasted. Given that 20% of the world's electricity is used to power lights, this represents an enormous amount of wasted energy.

In the 1940's a new, more efficient form of lighting, the fluorescent bulb, was introduced. Fluorescents work by passing electrical current through gas in a tube, producing invisible ultraviolet light. A phosphor coating on the inside of the tube then converts the ultraviolet to visible light. Little heat is wasted. Fluorescents have proved popular in offices, factories, and stores, but they never took over the residential lighting market. The harsh color isn't as pleasing as the warmer glow of incandescent lamps. Besides, they have a tendency to flicker on and off and to produce an annoying buzz.

Now, lighting engineers are developing a new form of lighting that is both pleasing to the eyes and energy efficient. This is the light-emitting diode, or LED. LEDs are made up of layers of electron-charged substances. When an electrical current passes through the layers, electrons jump from one layer to another and give off light without producing heat. Different types of materials result in light of different colors. Red, green, and orange LEDs



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have been used for decades in devices such as digital clocks, calculators, and electronic toys. In the future, however, white-light-emitting diodes (WLEDs) may be used to light homes. Engineers say that they are significantly more efficient than either incandescent or fluorescent lights.

The next challenge for researchers is to develop an efficient, bright, inexpensive WLED. A few years ago, a Japanese scientist named Shuji Nakamura discovered that, by using layers of gallium nitride, he could create a powerful blue LED. Later, engineers devised two ways to use this blue LED to create a WLED. Red, green, and blue LEDs can be combined, creating a pleasant white light. Another way is to use a chemical coating similar to that inside a fluorescent bulb that converts the blue light to white. Nevertheless, it will still be some time before WLEDs are commonly used in homes. WLEDs are currently only twice as energy efficient as incandescent. They are also very expensive. But researchers believe that they can create WLEDs that are ten times as efficient and one thousand times as long-lasting as incandescent lights, making them cost effective.

LEDs may someday have an even greater impact on developing countries than in the developed world. Worldwide, an estimated 2 billion people lack access to electricity. Lighting is usually provided by kerosene lamps. Kerosene is expensive, creates indoor pollution, does not provide very bright light, and worst of all, causes many fires. A low-energy (1-watt) WLED can provide enough light for a person to read by – more light, in fact, than most kerosene lamps. An entire rural village could be lighted with less energy than that used by a single **conventional** 100-watt light bulb. Energy to light these efficient LEDs can be provided by batteries that are charged by pedal-driven generators, by hydroelectricity from rivers or streams, by wind-powered generators, or by solar energy.

**21** In paragraph 2, which of the following is NOT mentioned as one of the problems with fluorescent lights?

**A.** The need to replace them often

**B.** An annoying sound

**C.** The harsh quality of the light they produce

**D.** Their tendency to flicker

**22** According to the passage, a red LED is different from a green LED because it

**A.** is made from different materials

**B.** uses a different amount of energy

**C.** uses a red plastic filter, not a green one

**D.** produces less heat



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**23** The word **'they'** in paragraph 3 refers to

A. white-light-emitting diodes

B. digital clocks, calculators, toys, and similar devices

C. engineers

D. red, orange, and green LEDs

**24** In paragraph 5, what achievement of Shuji Nakamura does the author mention?

A. He discovered the chemical compound gallium nitride.

B. He invented the first WLED.

C. He found a way to combine blue, green, and yellow LED light.

D. He developed a bright blue LED.

**25** It can be inferred from the passage that the most recently developed type of LED is a powerful

A. red LED

B. white LED

C. blue LED

D. green LED

**26** In paragraph 5, the author compares one type of WLED with fluorescent light because they both

A. use ultraviolet light

B. are filled with gas

C. employ a chemical coating

D. are energy efficient

**27** From the information in paragraph 5, it is clear that WLEDs could be used in homes today if they were

A. not so expensive

B. easier to install

C. twice as efficient as incandescent lights

D. available in various colors

**28** The author gives details about the use of kerosene lights in paragraph 6 in order to

A. explain why people in developing countries prefer kerosene to electrical light

B. show the problems and dangers associated with this form of lighting

C. give an example of a type of lighting that is not as important as it once was

D. demonstrate that kerosene is brighter and easier to use than WLEDs



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29 The electricity to power WLEDs in rural villages would come directly from

A. the energy of the sun
B. batteries
C. water power
D. a human-powered generator

30 The word '**conventional**' in paragraph 6 is closest in meaning to

A. inexpensive
B. powerful
C. standard
D. experimental

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# PASSAGE 4

Questions 31-40

15 minutes

**GHI CHÚ**

Các câu hỏi dễ hơn cần ưu tiên trả lời đúng

★ Câu hỏi thông tin chi tiết: **35**

★ Câu hỏi tham chiếu: **32**

★ Câu hỏi từ vựng: **31, 34, 39**

An important part of marketing is determining what price to charge consumers for goods and services. Companies **aspire** to set prices that are high enough to allow them to make a profit but low enough to encourage people to purchase their products. To determine these prices, marketing specialists must consider a variety of factors and use a number of different pricing approaches.

Cost-based approaches determine the price of a product based on how much it costs to make. This is the simplest method because manufacturers can easily determine how much it will cost them to produce their goods. After they calculate the price of materials and labor, they add a set percentage to that cost, called a standard markup, which covers advertising, marketing, and other administrative costs, as well as profit. The main



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