

### Question 1.

Not many inventions last for more than 100 years without major modifications. One of these is the incandescent light bulb, which still produces almost half of the artificial light used in homes around the world. The bulb works by passing an electric current through a thin metal filament that heats up and then emits light. The filament is enclosed in a glass bulb filled with an inert gas, such as nitrogen, to prevent the oxygen in the air from reaching the hot filament, which would otherwise rapidly burn away. Incandescent bulbs are very inefficient, converting only about 5 % of the energy they receive into light.

Which of the following statements is correct?

- a) Since it was developed, the incandescent light bulb has not been modified in any way
- b) For the last 100 years, the incandescent light bulb has produced about half of the light used in homes around the world
- @ Incandescent light bulbs would not last very long if the filament was exposed to the air
- d) Incandescent light bulbs are the least efficient light source, in terms of the percentage of energy they actually convert

### Question 2.

Leprosy is a chronic infectious disease that affects humans by attacking the nervous system, particularly the nerves of the hands, feet and face. The disease is characterised by skin lesions that form on the body, coupled with a loss of sensation in the hands and arms, or legs and feet. It is difficult to diagnose leprosy accurately, as in the early stages of the disease people often have only minor symptoms. However, once it is diagnosed, it is curable with drugs. There are two forms of the disease: 'tuberculoid' and 'lepromatous'. Both produce skin lesions, but the 'lepromatous' form is more severe, producing disfiguring lumps and bumps all over the body.

Which of the following statements is correct?

- a) The 'tuberculoid' form of leprosy is the less severe form
- b) Although leprosy is curable with drugs, the damage it has already done is irreversible
- c) The effects of leprosy are worse for the hands and arms than they are for the legs and feet
- d) The 'lepromatous' form of leprosy is the easier to diagnose

### Question 3.

An oratorio is a large musical composition for orchestra, vocal soloists and a chorus of singers. Whilst it tells a story using music, it differs from an opera because it does not have scenery, costumes or any acting. The peak period for the composition of oratorios was the 17th and 18th centuries and, although oratorios are rarely composed nowadays, performances of famous old oratorios are regular and popular events. Most oratorios have biblical themes -however a number of composers, notably Handel, wrote oratorios based on famous Greek and Roman mythology to maximise their popular appeal. Whatever an oratorio was based on, it usually followed a formula - a classic hero and a moral or message for the audience to learn.

Which of the following statements is correct?

- a) Oratorios have biblical themes whereas operas tend not to
- b) Handel wrote oratorios in the 17th and 18th centuries
- c) Nowadays, the majority of oratorio performances are of old rather than modern compositions
- d) The most popular oratorios were based on Greek and Roman mythology, rather than biblical stories

### Question 4.

Western Poison Oak is actually no more related to oak trees than Poison Ivy is to ivy. In fact, both Poison Ivy and the Western Poison Oak actually belong to the Sumac family of shrubs and trees (of which the cashew tree is another member). Western Poison Oak and Poison Ivy both contain a resinous sap that causes an irritating itchy rash, often accompanied with blistering of the skin, when humans come into contact with it. Whilst the shrubs do not naturally secrete the resin – it is only found on bark and leaves if the plant has been damaged in some way – some people are so sensitive that only a molecule or two of the toxin is necessary to cause a reaction.

Which of the following statements is correct?

- a) Merely touching the cashew tree causes irritation to humans
- b) The cashew tree is more closely related to the Western Poison Oak than an oak tree
- c) Western Poison Oak is more irritating to humans than Poison Ivy
- d) Most members of the Sumac family have a toxic sap

### Question 5

Research suggests that eating walnuts at the end of a meal may help cut the damage that fatty food can do to the arteries. A team of scientists compared the effect of walnuts and of olive oil on people with normal and with moderately high levels of cholesterol. Tests showed that both the olive oil and the walnuts helped to reduce the sudden onset of harmful inflammation and oxidation in arteries that follows a meal high in saturated fat, regardless of people's levels of cholesterol. However, unlike olive oil, the walnuts also helped preserve the elasticity and flexibility of the arteries, which can decrease the risk of heart disease and stroke.

Which of the following statements is correct?

- a) Olive oil has no effect on the risk of heart disease or stroke
- b) The study showed walnuts lead to additional health benefits compared to olive oil
- c) The most serious problems that affect the arteries are caused by saturated fat
- d) The scientists expected to find that walnuts had different effects depending on people's cholesterol levels

### Question 6

The colour of a cow's skin influences its ability to cope with heat and solar radiation. Cows with black skin absorb more heat and radiation from the sun than do cows with white skin, and excessive heat and solar radiation results in a decrease in milk production and milk quality. One large study found, amongst cows farmed in a tropical climate, a 2 litre increase in annual milk production for each 1% increase in the area of white skin.

Which of the following statements is correct?

- a) In cold climates, black cows would produce more milk than white ones
- b) Heat and solar radiation are the major determinants of milk volume
- c) Skin colour in cows has been shown to affect their capacity to produce milk
- d) The study suggests that white-skinned cows will generally produce more milk than dark-skinned ones

### Question 7.

The Farm Advisory Board is considering proposals to reduce the impact of the regulations detailed in the new EU nitrates Directive. This Directive, aimed at improving the quality of drinking water, introduced restrictions on how much nitrate fertiliser can be used on farmland. The Board is studying a report from its scientific staff which supports an increase in the nitrogen limits in the Directive. However, speaking for the union, the Farmers' Union President said these new limits were still insufficient to allow even reasonably intensive commercial farming to continue. Despite these criticisms, the Board's chairman said the proposals could potentially resolve many of the difficulties that farmers had with the recently introduced limits.

Which of the following statements is correct?

- a) The nitrates Directive stopped the use of nitrates on farmland
- b) The Farm Advisory Board is in favour of increasing the nitrogen limits in the nitrates Directive
- c) The Farmers' Union opposes any directive that restricts nitrates use
- d) The Farmers Union believes that the new proposals do not go far enough to solve the problems that farmers face from the nitrates Directive

### Question 8

The Lenape people were loosely organised groups of Native Americans who once lived in the US. Their language was also known as Lenape and had two main dialects, Munsee and Unarni. Sometimes the two were considered to be separate languages, despite being very similar. Munsee, also known as Minnisink, was spoken in New York, Long Island and the area surrounding the upper Delaware River. It is now only spoken by a few people in parts of Canada, where the last remaining fluent native speaker also lives. Unarni was spoken in the area surrounding the lower Delaware River and some parts of Oklahoma, but is now extinct. However, attempts are being made to resurrect the Unarni dialect, which would create a situation where more people speak Unarni than Munsee.

Which of the following statements is correct?

- a) The last remaining speakers of Munsee were forced to leave the US and now live in Canada
- b) The Lenape language had only two dialects -Munsee and Unarni.
- c) In the future, more people may speak Unarni than Minnisink:
- d) The dialect of the Lenape language that was spoken in the area surrounding the upper Delaware River is now extinct

### Question 9

Many visitors from abroad are surprised to learn that the US economy is not dominated by giant corporations. 99 % of all companies in the country employ fewer than 500 people. These small businesses employ almost half of all US workers. Small businesses produced three quarters of all new jobs in the 1990s; this is an even larger contribution to employment growth than they made in the 1980s. They also represent an entry point into the economy for under-represented groups such as women and part-time workers. For example, the number of female-run small businesses climbed by 89 % to an estimated 8.1 million between 1987 and 1997.

Which of the following statements is correct?

- a) 89% of small business set up between 1987 and 1997 were run by women
- b) Businesses with fewer than 500 people generated more new jobs in the 1990s than giant corporations
- c) The majority of new jobs created in the 1980s were in small businesses
- d) Small businesses make a greater financial contribution to the US economy than giant corporations

### Question 10

Although there are many more small and medium-sized firms than large companies, big businesses play a dominant role in the economy. Big businesses are important to the overall economy because they tend to have more financial resources to conduct research and develop new goods than do small firms. Large companies can supply goods and services to more people, and they frequently operate more efficiently than small ones. In addition, because large volumes tend to lead to lower costs per unit, they can often sell their products at lower prices because of the large volume of sales they achieve. Large businesses also have an advantage in the marketplace because many consumers are attracted to well-known brand names, which they believe offer a certain level of quality.

Which of the following statements is correct?

- a) Developing new products is easier for large businesses than for small ones because large companies have lower research costs
- b) The total number of products sold by large businesses is greater than the total number sold by small ones
- c) Large businesses can offer goods at lower prices because they sell more of them than small businesses do
- d) Large businesses can produce goods of a higher quality than small businesses can