

SCIENCE QUIZ PART-1

Question: Coal is formed due to the process of...?

- 1. ☐ Evaporation
- 2. ☐ Centrifugation
- 3. ☐ Conjugation
- 4. ☒ Carbonization

Correct Answer

About 300 million years ago, in a period of history called the Carboniferous Era, huge swamp forests were buried deep in the Earth's crust due to earth movements. Extreme pressure and temperature converted their biomass into coal. This process is called Carbonization.

Question: What is the main component of biogas and natural gas?

- 1. ☐ Ethane
- 2. ☐ Methane
- 3. ☐ Propane
- 4. ☐ Butane

Correct Answer

Biogas also contains hydrogen, carbon dioxide and hydrogen sulphide. In fact it contains about 65 percent of CH₄. Natural gas contains small amounts of ethane and propane also. Both the gases are clean fuels since they cause little or no pollution. The importance of these gases is increasing at a fast rate for both rural and urban usage.

Question: Aspirin can be found in many household medicine cabinets. But what is it chemically?

- 1. ☒ Paracetamol
- 2. ☐ Acetylsalicylic acid
- 3. ☐ Acetaminophen
- 4. ☐ Ibuprofen

Correct Answer

A tablet of aspirin contains pure acetylsalicylic acid and a bit of binder to help hold the tablet together. Aspirin is a remarkable substance in that it can act as an analgesic (to relieve pain), an antipyretic (to lower fever) _and_ an anti-inflammatory agent (to reduce inflammation). It was first synthesised in 1853 and was accepted into widespread pharmaceutical use at the end of the 19th century. The parent compound salicylic acid was also known as spiraeic acid, and the name "aspirin" was derived by taking the "a" from "acetyl" and combining it with "spir" taken from the acid's name. Aspirin can cause irritation of the stomach, and due to this, its popularity has declined recently (in favour of other medications such as paracetamol, ibuprofen and acetaminophen) but it is still the most widely used drug for the treatment of illness or injury.

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Question: A primary fuel is that which is used in the same form as it occurs in nature. Which of the following is not a primary fuel?

- 1. ☒ Kerosene
- 2. ☐ Wood
- 3. ☐ Coal
- 4. ☐ Natural Gas

Correct Answer

Kerosene is obtained by the fractional distillation of oil, and hence is a 'secondary fuel'.

Question: Where was the first oil well struck in the world?

- 1. ☐ Kuwait
- 2. ☒ USA
- 3. ☐ Saudi Arabia
- 4. ☐ Australia

Correct Answer

You might have thought that oil was first struck somewhere in the Middle East. Nope!. In 1859, the first oil well was struck in Pennsylvania in the USA! The second oil well was struck in 1867 in Makum, India.

Question: What is the major component of this adhesive: woodworking glue also known as PVA glue?

- 1. ☐ Natural rubber
- 2. ☐ Polyamide
- 3. ☐ Cellulose
- 4. ☒ Poly (vinyl alcohol)

Correct Answer

OK, so the "PVA" in the question probably gave this one away! PVA = poly (vinyl alcohol). PVA glue is a solution of the water-soluble polymer poly (vinyl alcohol). The solution is fairly viscous and when it dries, it gives a nice clear finish. PVA is also used to make the popular children's toy "Slime". All that needs to be done is mix a solution of PVA with a solution of Borax with a little bit of dye and voila - Slime! Well, it's not quite that simple, but that's the general idea. The borax makes cross-links between PVA molecules, making much larger molecules that are even more viscous than the original PVA solution.

Question: What is dry ice?

- 1. ☐ Liquid nitrogen

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- 2. ☐ Water ice
- 3. ☒ Solid carbon dioxide
- 4. ☐ Frozen ethanol

Correct Answer

"Dry ice" is solid carbon dioxide (CO₂). Carbon dioxide freezes at -78.5 degrees Centigrade. When dry ice "melts" it undergoes a process called sublimation. This means that it is converted from a solid directly to a gas, bypassing the intermediate liquid stage. This is where the name "dry ice" comes from - when it melts, you never get any liquid (unlike water ice), hence it's "dry".

Question: Nail polish remover is something that us girls just can't do without. But what exactly is it in nail polish remover that does the polish removing?

- 1. ☐ Methanol
- 2. ☐ Ethanol
- 3. ☒ Acetone
- 4. ☐ Limonene

Correct Answer

Nail polish remover has acetone as a major component. Acetone is an excellent solvent - in my experience as a chemist, I've found it dissolves pretty much all organic (carbon-based) chemicals! Of course, there are exceptions, but when I want to clean my glassware, acetone is the solvent of choice! So when you use nail polish remover containing acetone, all it's doing is dissolving the nail polish so you can wipe it away. You can also buy "acetone-free" nail polish remover; this

Question: Bleach is another useful household chemical. It is often referred to as "chlorine bleach". What is the main component of household bleach?

- 1. ☐ Sodium chloride
- 2. ☒ Sodium hypochlorite
- 3. ☐ Hydrochloric acid
- 4. ☐ Sodium hydroxide

Correct Answer

Household bleach is a 3-6% solution of sodium hypochlorite (NaOCl) in water. There is no actual "chlorine" (Cl₂) in bleach at all, although it does contain a chlorine atom (Cl). Sodium hypochlorite is, however, prepared from chlorine (Cl₂) and sodium hydroxide (NaOH), which is perhaps where the name "chlorine bleach" comes from. It is a very useful chemical in that it not only kills germs, but is also an excellent stain remover. Under normal household use, sodium hypochlorite breaks down into sodium chloride (table salt), oxygen and water, and has been recently found by the Swedish Environmental Research Institute to pose no environmental problems provided it is used in the correct manner. (Thanks to howstuffworks.com - an incredibly interesting website. If you haven't checked it out, make sure you've got a spare hour or three when you do go have a look!)

Question: Which element has close to 10,000,000 known compounds?

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- ☐ Oxygen
- ☒ Carbon
- ☐ Hydrogen
- ☐ Sodium

Correct Answer

Carbon is unique among the elements in the vast number and variety of compounds it can form. With hydrogen, oxygen, nitrogen, and other elements, it forms a very large number of compounds, carbon atom often being linked to carbon atom. There are close to ten million known carbon compounds, many thousands of which are vital to organic and life processes.

Question: What element's three isotopes have different names?

- ☐ Helium
- ☐ Oxygen
- ☐ Carbon
- ☒ Hydrogen

Correct Answer

The ordinary isotope of hydrogen, H, is known as Protium, the other two isotopes are Deuterium (a proton and a neutron) and Tritium (a proton and two neutrons). Deuterium and Tritium are both used as fuel in nuclear fusion reactors. One atom of Deuterium is found in about 6000 ordinary

Question: What is the lightest element with an atomic symbol not related to its English name?

- ☐ Potassium (K)
- ☒ Sodium (Na)
- ☐ Iron (Fe)
- ☐ Tungsten (W)

Correct Answer

Metallic sodium is priced at about 15 to 20 cents per lb in quantity. Reagent grade (ACS) sodium in January 1990 cost about \$35 per lb. On a volume basis, it is the cheapest of all metals.

Question: Which chemical compound occurs naturally in tea and coffee and is a popular additive to soft drinks?

- ☐ Cellulose
- ☐ Nicotine
- ☐ Maltose

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4. ☒ Caffeine

Correct Answer

Caffeine belongs to a class of organic compounds called alkaloids (as does nicotine). Caffeine is a powerful stimulant of the central nervous system. It is usually present in coffee in the amount of 100-150 mg per cup (of course in decaf, there is virtually none!). Like many alkaloids, caffeine acts as a poison in large quantities. The lethal dose of caffeine for adults is estimated at about 10 g, so unless you drink about 70-100 cups of coffee a day, you should be safe!

Question: Which planet orbits the sun at a speed of 110,000 kph?

1. ☒ Earth
2. ☐ Venus
3. ☐ Jupiter
4. ☐ Mars

Correct Answer

Earth is about 150,000,000 km away from the sun.

Question: Which planet is 110 million km from the sun?

1. ☐ Earth
2. ☐ Mercury
3. ☐ Mars
4. ☒ Venus

Correct Answer

That is the same as 70 million miles.

Question: The International Space Station has protection from meteors. What is it made of?

1. ☐ Rubber
2. ☒ Kevlar
3. ☐ Plastic
4. ☐ Steel

Correct Answer

That's right, the same stuff used for bullet-proof vests. It is a foot thick. About 100,000 meteors should strike the ISS in its 20 year lifetime. While iron is a common part of meteors. most meteors

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are composed of chondrite. Chondrite is similar in composition to the mantles and crusts of the terrestrial planets.

Question: At room temperature, which element conducts electricity better than any other element?

- 1. ☐ Pb
- 2. ☐ Au
- 3. ☒ Ag
- 4. ☐ Cu

Correct Answer

Question: Which of the "rare" gases is the most common in the atmosphere?

- 1. ☐ Radon
- 2. ☐ Neon
- 3. ☒ Xenon
- 4. ☐ Argon

Correct Answer

Argon makes up a little less than 1% of the atmosphere. Helium is by far the most common of the rare gases in the universe- only hydrogen is more common. However, it is found in lower concentrations than argon in Earth's atmosphere, because atmospheric helium easily escapes into space.

Question: What scientist discovered the radioactive element radium?

- 1. ☐ Isaac Newton
- 2. ☐ Albert Einstein
- 3. ☐ Benjamin Franklin
- 4. ☒ Marie Curie

Question: Acid rain may have a pH of...?

- 1. ☒ 6
- 2. ☐ 7
- 3. ☐ 8
- 4. ☐ 9

Correct Answer

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Question: Which one of these is a non-metal?

- 1. ☐ Scandium
- 2. ☒ Sulfur
- 3. ☐ Zinc
- 4. ☐ Potassium

Correct Answer

Question: Exhaled air has what % of its oxygen left?

- 1. ☒ 77%
- 2. ☐ 26%
- 3. ☐ 48%
- 4. ☐ None

Question: Which of the two metals are mixed in manufacturing of stainless steel ?

- 1. ☐ Zinc, chromium
- 2. ☐ Chromium, nickel
- 3. ☒ Chromium, iron
- 4. ☐ Nickel, iron

Question: Much of our body heat escapes through the head. What percent is this?

- 1. ☐ Ninety percent
- 2. ☐ Sixty percent
- 3. ☐ Seventy percent
- 4. ☒ Eighty percent

Correct Answer

Hats therefore help you feel warm.

Question: You are making a model of the Earth and Moon to show their relative sizes and massiveness. You've decided that Earth will be a ball of clay 6 inches in diameter, so the Moon should be...?

- 1. ☐ A tennis ball
- 2. ☒ A golf ball
- 3. ☐ A ping pong ball

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4. ☒ A baseball

Correct Answer

A golf ball would be a good match for size and massiveness, and the largest dimples on the ball would match the sizes of the largest lunar craters, too!

Question: What is NOT a greenhouse gas?

1. ☒ Nitrogen
2. ☐ Methane
3. ☐ Carbon dioxide
4. ☐ Ozone

Correct Answer

Nitrogen is NOT a greenhouse gas, however nitrous oxide is. Greenhouse gases contribute to global warming. Deforestation is a big contributor to the greenhouse effect.

Question: How distant is the closest star?

1. ☐ 54 million miles away
2. ☐ 72 million miles away
3. ☒ 93 million miles away
4. ☐ 127 million miles away

Correct Answer

The closest star to Earth is 93 million miles away, this Star is ofcourse the Sun...

Question: What stored energy is commonly called...?

1. ☒ Potential energy
2. ☐ Kinetic energy
3. ☐ Chemical energy
4. ☐ Radiant energy

Correct Answer

Potential energy is stored energy. Kinetic energy is moving energy. Radiant energy is the energy the sun gives off! Chemical energy is the energy created by a chemical reaction.

Question: What the main particles of an atom are?

1. ☐ Photon, electron, and neutron

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- 2. ☐ Neutron, electron, and proton
- 3. ☐ Photon and electron
- 4. ☐ Proton and electron

Correct Answer

The proton has a positive charge, the neutron has no charge, and the electron has a negative charge. The electrons are on the outer orbit of an atom. A covalent bond exists when electrons are shared between atoms. This is the most common form of chemical bonding. All matter is made out of atoms. Chemical elements contain only one type of atom. All the chemicals in a cell are made out of atoms, so atoms must be VERY, VERY tiny indeed!

Question: What gas plants contribute to the earth's atmosphere?

- 1. ☐ Nitrogen
- 2. ☒ Oxygen
- 3. ☐ Carbon dioxide
- 4. ☐ Hydrogen

Correct Answer

Plants keep the oxygen content stable by photosynthesis. They release oxygen gas into the atmosphere as a by-product of photosynthesis. Denitrifying bacteria contribute to the vast amount of atmospheric nitrogen in the atmosphere (78% of the earth's atmosphere is nitrogen). Carbon dioxide is needed for photosynthesis, but isn't released into the atmosphere by photosynthetic processes.

Question: Materials through which light cannot pass are said to be...?

- 1. ☐ Transparent
- 2. ☒ Opaque
- 3. ☐ Translucent
- 4. ☐ Obstructor

Correct Answer

Opaque materials are those which do not allow the rays of light to pass through them at all. Hence, objects cannot be seen through opaque materials such as wood and metal.

Question: The distance between one of the magnetic poles and the centre of the bar magnet is called the...?

- 1. ☐ Magnetic equator
- 2. ☐ Effective length
- 3. ☐ Equator length

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4. ☒ Length of magnet

Correct Answer

The length of magnet is the distance between one of the magnetic poles (north or south) and the centre of the magnet ($ON = OS = L$). On the other hand, the effective length is the distance between the magnetic north pole and the magnetic south pole of a bar magnet ($NS = 2L$). Thus, the effective length is twice the length of magnet.

Question: The distance between the magnetic north pole and magnetic south pole of a bar magnet is called the...?

1. ☐ Pole Length
2. ☒ Effective length
3. ☐ Equatorial axis
4. ☐ Length of magnet

Correct Answer

The distance between the magnetic north pole and the magnetic south pole of a bar magnet is the effective length ($NS = 2L$), whereas the distance between one of the magnetic poles (north or south) and the centre of the magnet is called the length of magnet ($ON = OS = L$). Thus, the effective length is twice the length of magnet.

Question: Most of the magnetic power appears to be concentrated at certain points of a magnet. These points are called...?

1. ☒ Poles
2. ☐ Inductors
3. ☐ Keepers
4. ☐ Pointers

Correct Answer

Magnetic poles are the points (N for north and S for south) slightly within the ends of a magnet where most of the magnetic power appears to be concentrated.

Question: Elements in the modern periodic table are arranged on the basis of their...?

1. ☐ Atomic Mass
2. ☒ Atomic Number
3. ☐ Boiling Point
4. ☐ Chemical Symbols alphabetically

Correct Answer

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Question: Elements in the same group have similar...?

- 1. ☐ Atomic masses
- 2. ☒ Chemical properties
- 3. ☐ Atomic radii
- 4. ☐ Atomic numbers