1. British chemist born in Penzance in Cornwall in England on 17 December, 1778. He is best known for his contributions to the discoveries of chlorine and iodine and his invention of a miner's safety lamp.
   a. Humphry Davy
   b. Jones Davy
   c. De Broglie
   d. John Dalton

2. A synthetic element with atomic number 99. It is the seventh transuranic element, and an actinide. It was discovered as a component of the debris of the first hydrogen bomb explosion in 1952, and named in honour of physicist Albert Einstein.
   a. Samarium
   b. Gadolinium
   c. Einsteinium
   d. Fermium

3. An acronym referring to a family of iron alloys which in addition to iron are composed primarily of aluminium (Al), nickel (Ni) and cobalt (Co). Its alloys are ferromagnetic, with a high coercivity and is used to make permanent magnets. Before the development of rare-earth magnets in the 1970s, they were the strongest type of permanent magnets.
   a. Duralumin
   b. Alnico
   c. Magnalium
   d. Stainless steel

4. The fundamental physical constant that relates the molar mass of a compound to the mass of a sample. It was initially defined by Jean Baptiste Perrin as the number of atoms in one gram-molecule of atomic hydrogen, meaning one gram of hydrogen. This number is also known as Loschmidt constant in German literature.
   a. Planck Constant
   b. Faraday Constant
   c. Molar Gas Constant
   d. Avagadro Constant

5. An Austrian physicist whose greatest achievement was in the development of statistical mechanics, which explains and predicts how the properties of atoms determine the visible properties of matter. The famous formula for entropy $S = k_b \ln W$ was given by him.
   a. John Dalton
   b. James Maxwell
   c. Ludwig Boltzmann
   d. Joseph Stefan

6. After the Big Bang, the universe was extremely hot and dense. As the universe cooled, quarks and electrons were produced. A few millionths of a second later, quarks aggregated to produce protons and neutrons. Within minutes, these protons and neutrons combined into nuclei. It took 380,000 years for electrons to be trapped in orbits around nuclei, forming the first atoms. These were mainly .........., which are still by far the most abundant elements in the universe.
   a. Hydrogen and Helium
   b. Carbon and Silicon
   c. Oxygen and Nitrogen
   d. Uranium and Plutonium

7. A borosilicate glass first produced by the Corning Glass Works company. First formulated during the early twentieth century, it has become an important material for a variety of applications that require heat and chemical resistance.
   a. Bottle glass
   b. Flint glass
   c. Pyrex glass
   d. Hard glass

8. A fullerene is a molecule of carbon in the form of a hollow sphere, ellipsoid and many other shapes. Spherical fullerenes also referred to as Buckminsterfullerenes. $C_{60}$ is the smallest fullerene molecule containing pentagonal and hexagonal rings, resemble the balls used in football (soccer). How many pentagons and hexagons does $C_{60}$ contain respectively?
   a. 14 and 20
   b. 12 and 20
   c. 12 and 24
   d. 14 and 24
9. A polymer with chemical name Poly-paraphenylene terephthalamide was invented by Polish-American chemist Stephanie Kwolek while working for DuPont, in anticipation of a gasoline shortage. It is the registered trademark for a para-aramid synthetic fiber with high tensile strength-to-weight ratio; 5 times stronger than steel. Name this polymer, which is also used to make bulletproof vests.
   a. Nylon
   b. Teflon
   c. PVC
   d. Kevlar

10. Malachite mineral was one of the first ores used to produce copper metal. The mineral malachite is an excellent material for producing a powdered pigment because it can easily be ground into a fine powder, it mixes easily with vehicles, and it retains its colour well when exposed to light over time. What colour does malachite (copper carbonate hydroxide) produce?
   a. Blue
   b. Red
   c. Green
   d. White

11. An organic chemical of the catecholamine and phenethylamine families that plays several important roles in the brain and body. It functions as a neurotransmitter and several important diseases (Parkinson’s disease) of the nervous system are associated with dysfunctions of this chemical synthesized in plants and multicellular animals.
   a. Dopamine
   b. Glutamate
   c. Hydrogen sulphide
   d. Epinephrine

12. A coordination complex of rhodium with the formula RhCl(PPh₃)₃ used as a catalyst for hydrogenation of alkenes. The catalytic and organometallic studies on this complex also played a significant role on the subsequent development of asymmetric hydrogenation transfer catalysts which set the foundations for modern asymmetric catalysis.
   a. Nickel Catalyst
   b. Wilkinson’s Catalyst
   c. Wacker’s catalyst
   d. BINAP

13. A principle that can be used to predict the effect of a change in conditions on a chemical equilibrium. Also known as “The Equilibrium law” states; a change in one of the variables that describe a system at equilibrium produces a shift in the position of the equilibrium that counteracts the effect of this change.
   a. Le Chatelier’s Principle
   b. Avogadro’s law
   c. Doppler effect
   d. Fermat’s principle

14. A German physicist and physical chemist developed with Debye a theory of strong electrolytes which became known as the Debye-Huckel theory. He introduced a theory of the C=C bond based on quantum mechanics which was to become the famous Huckel method of approximate molecular orbital (HMO) calculations on pi-electron systems.
   a. Peter Debye
   b. Henri Moissan
   c. Erich Hückel
   d. Otto Hahn

15. The Royal Swedish Academy of Sciences awarded the 1999 Nobel Prize in Chemistry to Professor Ahmed H. Zewail, California Institute of Technology, for showing that it is possible with rapid laser technique to see how atoms in a molecule move during a chemical reaction. The Academy’s citation: For his studies of the transition states of chemical reactions using _______spectroscopy.
   a. Nanosecond
   b. Picosecond
   c. Millisecond
   d. Femtosecond

Answer:

1) a 2) c 3) b 4) d
5) c 6) a 7) c 8) b
9) d 10) c 11) a 12) b
13) a 14) c 15) d

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