

## Chapter - 2

## Chemistry

Answer Key with Solutions  
Includes: All MCQs + Extra PYQs with Detailed Explanations

## Solutions

1. (c); The most important form of elemental phosphorus from the perspective of applications and chemical literature is white phosphorus. It consists of tetrahedral P<sub>4</sub> molecules, in which each atom is bound to the other three atoms by a single bond.
2. (d); Alkali metals have one electron in their outer shell so alkali metal can easily lose electrons.
3. (d); Catalysis is the increase in the rate of a chemical reaction due to the participation of an additional substance called a catalyst, which is not consumed in the catalyzed reaction and can continue to act repeatedly. Thus, changes activation energy
4. (c); Chromium oxide is used to create green glass
5. (a); There are two types of particle in the nucleus of an atom the proton and the neutron
6. (c); Baking soda is also known as Sodium bicarbonate. It is a chemical compound with the formula NaHCO<sub>3</sub>. It is a salt composed of sodium ions and bicarbonate ions. Sodium bicarbonate is a white solid that is crystalline but often appears as a fine powder
7. (b); There are two elements that are liquid in room temperature which are Bromine (Br) and Mercury (Hg).
8. (c); Endothermic process describes a process or reaction in which the system absorbs energy from its surroundings. Sweating is a endothermic reaction
9. (c); Milk is converted into curd or yogurt by the process of fermentation. Milk consists of globular proteins called casein. The curd forms because of the chemical reaction between the lactic acid bacteria and casein. Thus, lactase is the catalyst used in conversion of milk into curd
10. (b); Nylon 66 is a type of polyamide or Nylon. It is used in plastic Industries in making bristles for brushes
11. (c); Acid turns blue litmus paper red
12. (c); Carbon Monoxide is a colorless, odorless, tasteless gas that's produced during incomplete combustion of any fuel. It is a pollutant released by automobiles
13. (d); Full form of PVC is Polyvinyl chloride
14. (d); Aromatic hydrocarbons contain at least one benzene like ring in their molecules
15. (c); Chromite is the only ore of chromium, a metal essential for making stainless steel, nichrome, chromeplating, pigments, refractories, chemicals and pharmaceuticals
16. (a); Water has maximum density
17. (b); Oxidation is the loss of electrons or an increase in oxidation state by a molecule, atom, or ion



- 18 (b); A redox reaction is a type of chemical reaction that involves both oxidation and reduction simultaneously.
- 19 (d); Nitrogen is a chemical element with symbol N and atomic number 7. It was first discovered and isolated by Scottish physician Daniel Rutherford in 1772
- 20 (a); A Geiger counter (Geiger-Muller tube) is a device used for the detection and measurement of all types of radiation alpha, beta and gamma radiation.
- 21 (b); Haematite is an ore of Iron
- 22 (b); Alpha particles made of 2 protons and 2 neutrons and they have low penetrating power
- 23 (a); Oxidation is loss of electrons and addition of oxygen. It also involves addition of electronegative element
- 24 (b); Soda water was invented by Joseph Priestley
- 25 (a); Protons and neutrons have nearly the same mass while electrons are much less massive
- 26 (b); Evaporation can separate a solute from its solution
- 27 (a); Transition metals don't have tendency to gain electrons
- 28 (d); Ethylene is a hydrocarbon which has the formula  $C_2H_4$  since the double bond is between two carbon atoms so there is no difference in electronegativity. That's why the shared pair of electrons come lie in between those two carbon atoms, so ethylene is non polar
- 29 (a); Phosgene can form from chloroform, in presence of oxygen and UV light
- 30 (b); Benzene was first discovered by the English scientist Michael Faraday in 1825
- 31 (d); Acids are not bad conductor of electricity in aqueous solution
- 32 (c); Ethyl alcohol is used in making liquors, medicines and as a fuel in aircrafts
- 33 (b); Glycol is an organic compound with the formula  $(CH_2OH)_2$ . It is used to prevent freezing of fuel in space crafts
- 34 (b); Methane is a chemical compound with the chemical formula  $CH_4$  and it is a major component of natural gas
- 35 (b); Global warming, also referred to as climate change, is the observed century-scale rise in the average temperature of the Earth's climate system and its related effects. Carbon dioxide is one of the Green House gas which cause global warming. Carbon dioxide is not produced by Global warming
- 36 (c); Carnotite an important uranium ore
- 37 (c); The Montreal Protocol is an international environmental agreement with universal ratification to protect the earth's ozone layer by eliminating use of ozone depleting substances (ODS) like CFC, which would otherwise allow increased UV radiation to reach the earth
- 38 (d); Malachite is an ore/mineral of copper
- 39 (a); Negative ion which is created by an electron gain and it has more electrons than protons
- 40 (c); Metals conduct electricity because of free electrons
- 41 (c); The ozone layer or ozone shield is a region of Earth's stratosphere that absorbs most of the Sun's ultraviolet (UV) radiation. Stratosphere contains high concentrations of ozone ( $O_3$ ) in relation to other parts of the atmosphere
- 42 (c); Modern bulletproof vests are predominantly made out of dozens of layers of tightly woven material, predominantly Kevlar. The layers are sealed together into a vest-shaped sheet to protect the wearer's org
- 43 (c); Manganite is an ore of Manganese
- 44 (c); Pentane ( $C_5H_{12}$ ) has three structural isomers
- 45 (d); Sphalerite is the chief ore of Zinc
- 46 (d); Hydralazine is used to cure high blood pressure (hypertension)
- 47 (d); Acetic acid is known as vinegar
- 48 (a); Polar covalent bonding is a type of chemical bond where a pair of electrons is unequally shared between two atoms. Bond between P-Cl is a polar covalent bond
- 49 (c); The chemical widely used for artificially ripening fruits is Calcium Carbide ( $CaC_2$ )
- 50 (a); The pH of water is 7
- 51 (d); Solid carbon dioxide is known as Dry Ice
- 52 (b); Beryl is an ore/mineral of Beryllium
- 53 (d); Deoxyribo nucleic acid (DNA) is a molecule that carries the genetic instructions used in the growth, development, functioning and reproduction of all known living organisms and many viruses
- 54 (b); Natural Rubber is not a monomer of cisoprene
- 55 (b); Carbon Tetrachloride have no dipole moment because of regular tetrahedral structure
- 56 (d); Bupropion is used to treat major depressive disorder and to help people stop smoking.



- 57 (b); The orange colour of carrot is because of Carotene
- 58 (c); Snake venom is highly modified saliva containing zootoxins which facilitates the immobilization and digestion of prey, and defends against threats. It is injected by unique fangs after a bite, and some species are also able to spit
- 59 (c); Heavy water (D<sub>2</sub>O), also called deuterium oxide, water composed of deuterium, the hydrogen isotope with a mass double that of ordinary hydrogen, and oxygen
- 60 (c); Arsenic has highest electronegativity in the given elements
- 61 (b); Tramadol is used to treat moderate to moderately severe pain
- 62 (c); Neoprene is a family of synthetic rubbers that are produced by polymerization of chloroprene. Neoprene exhibits good chemical stability and maintains flexibility over a wide temperature range
- 63 (d); When sodium (Na) and chlorine (Cl) are combined, the sodium atoms each lose an electron, forming cations (Na<sup>+</sup>), and the chlorine atoms each gain an electron to form anions (Cl<sup>-</sup>). These ions are then attracted to each other in a 1:1 ratio to form sodium chloride (NaCl) and form ionic bond
- 64 (c); Hemoglobin in humans has a very high affinity for carbon monoxide, forming carboxyhemoglobin which is a very bright red in color
- 65 (c); Vitamin A is also known as retinol because it produces the pigments in the retina of the eye. Vitamin A promotes good vision, especially in low light
- 66 (a); Bromine has lowest melting point in the following. It has melting point of -7.2°C
- 67 (a); Ethane gas has a slightly sweet in taste
- 68 (d); Trypsin is one of the three principal digestive proteinases. Trypsin acts with the other proteinases to break down dietary protein molecules to their component peptides and amino acids
- 69 (a); The ancient Egyptians used Willow bark to produce aspirin as a remedy for aches and pains
- 70 (c); The acid present in lemon is citric acid
- 71 (c); Clark's method is a process for the large-scale removal of temporary hardness from water. Clark's process involves the addition of a controlled quantity of slaked lime
- 72 (a); Water vapor is unique in that its concentration varies from 0-4% of the atmosphere depending on time of day
- 73 (d); New Zealand is first country to impose carbon tax
- 74 (d); Prednisone drug is used as an Anti-Inflammatory drug. It is used to treat a number of different conditions, such as inflammation (swelling), severe allergies, adrenal problems, arthritis, asthma, blood or bone marrow problems, endocrine problems, eye or vision problems, stomach or bowel problems, lupus, skin conditions, kidney problems, ulcerative colitis, and flare-ups of multiple sclerosis
- 75 (b); Cobalt oxide is added to glass to gave it blue colour
- 76 (a); The (O-H) bond in CH<sub>3</sub>OH is Polar Covalent
- 77 (c); Quinine drug is yielded from Cinchona tree and is used to cure malaria
- 78 (d); Among the following elements Krypton has the lowest melting point
- 79 (c); HF compounds has the strongest hydrogen bond
- 80 (c); The chief ozone-depleting substances include chlorofluorocarbons (CFCs), carbon tetrachloride, hydrochlorofluorocarbons (HCFCs) and methyl chloroform
- 81 (c); Bhopal gas tragedy occurred on the night of 2-3 December 1984 at the Union Carbide India Limited (UCIL) pesticide plant in Bhopal, Madhya Pradesh. Over 500,000 people were exposed to methyl isocyanate (MIC) gas and other chemicals leaked from UCIL
- 82 (c); The Chlorofluoro carbon formed by chlorine, fluorine and carbon. They are often used as refrigerants, solvents, and for the manufacture of spongy plastics. It is the primary reason for depletion of the ozone layer.
- 83 (b); Oxygen atom is joined by double covalent bond
- 84 (d); Mercury has the lowest melting point. Mercury has a melting point of -37.89F
- 85 (a); Sodium bicarbonate is commonly known as baking soda. It is a chemical compound with the formula NaHCO<sub>3</sub>
- 86 (a); Metformin is an oral antidiabetic drug for the treatment of diabetes
- 87 (b); LPG is a mixture of two flammable but nontoxic gases called propane and butane



- 88 (b); When one S and one P orbital is hybridized, we get two orbitals at 180 degrees
- 89 (b); Acetic acid, also known as ethanoic acid or methane carboxylic acid, is a colorless liquid with a strong and distinct pungent and sour smell. Its chemical formula is  $C_2H_4O_2$  or can be written as  $CH_3COOH$  or  $CH_3CO_2H$
- 90 (c); The common name of Sodium Tetraborate Decahydrate is Borax
- 91 (d); Antibiotics also called antibacterials, are a type of antimicrobial drug used in the treatment and prevention of bacterial infections. Alexander Fleming invented Antibiotic
- 92 (c); Methanol is the simplest alcohol, being only a methyl group linked to a hydroxyl group. It is a light, volatile, colorless, flammable liquid with a distinctive odour very similar to that of ethanol (drinking alcohol). However, unlike ethanol, methanol is highly toxic and unfit for consumption. Chemical formula of Methanol is  $CH_3OH$
- 93 (a); Atoms bond with each other to reduce potential energy and gain stability
- 94 (b); Acetone is a colorless, flammable liquid that evaporates easily. In cosmetics, the most common use of acetone is in nail polish remover
- 95 (a);  $K^+$  is the formula of potassium ion whose configuration is same as the noble gas state. This means that potassium must have an electron configuration of  $1s^2, 2s^2, 2p^6, 3s^2, 3p^6$
- 96 (c); Graphene is an allotrope of Carbon in the form of a two dimensional atomic-scale hexagonal lattice in which one atom from each vertex
97. (a); Except  $Ca(CN)_2$  all are nitrogenous fertilizers
- 98 (c); Radon has lowest melting point among the following elements.
- 99 (a); Atomic Number of Beryllium is 4, Boron is 5, Nitrogen is 7, Fluorine is 9 and Sodium is 11. Hence, the atomic number of Sodium is higher than that of Fluorine
- 100 (d); Milk contains a sugar called lactose. It also contains harmless bacteria called lactobacillus, which uses lactose for energy and creates lactic acid as a by-product. It is the lactic acid which makes milk taste sour
- 101 (a); The Chemical formula of Cadmium Nitrate is  $Cd(NO_3)_2$
- 102 (b); The common name of hydrogen peroxide is Bleach(liquid)
- 103 (a); Crook Glass is a type of glass that contains cerium and other rare earths and has a high absorption of ultraviolet radiation; used in sunglasses
- 104 (b); Barium has atomic number 4. Barium loses 2 electrons to achieve noble gas electron configuration
- 105 (a); Ammonium dichromate is the inorganic compound with the formula  $(NH_4)_2Cr_2O_7$
- 106 (d); The residual attractive or repulsive forces between molecules or atomic groups that do not arise from a covalent bond, or ionic bonds is called Van der Waals bond
- 107 (a); Ozone is a gas composed of three atoms of oxygen ( $O_3$ ). Ozone occurs both in the Earth's upper atmosphere and at ground level. Its presence as a layer in stratosphere serves as a screen (called ozone shield) to block harmful ultraviolet radiation from reaching the earth's surface
- 108 (c); Georges Claude invented Neon Lamp
- 109 (c); End products of digestion of carbohydrates are Glucose, fructose and galactose
- 110 (c); Among the following elements, the lowest melting point is of Argon i.e.  $-189.4^\circ C$ .
- 111 (d); Brimstone is an alternative name for sulfur
- 112 (d); Atomic number of Hydrogen is 1
- 113 (b); The net charge of the ionic compound is zero. It is composed of one ion of calcium with a positive two charge and two ions of fluorine with a negative one charge on each. The charges cancel out, leaving the compound with no net charge
- 114 (c); Trichlorofluoromethane,  $CCl_3F$  consists of a centrally placed carbon atom with three chlorine atoms and one fluorine atom arranged approximately (the bond lengths are different) at the points of a tetrahedron around it. Trichlorofluoromethane is a greenhouse gas and ozone depleter
- 115 (d); The Mohs scale of mineral hardness is a qualitative ordinal scale characterizing scratch resistance of various minerals through the ability of harder material to scratch softer material. Created in 1812 by German geologist and mineralogist Friedrich Mohs
- 116 (d); Urea is an organic compound having chemical formula  $(NH_2)_2CO$ . Also called as Carbonic diamide. It is a colourless, odorless solid and highly soluble in water



117. (d); Atomic number of Magnesium is 12. While Atomic number of Fluorine is 9, Neon is 10, Sodium is 11 and Aluminium is 13
118. (a); Magnesium oxide is mild base therefore it turn red litmus blue while oxides of Sulphur, Phosphorus and Carbon are acidic in nature so they did not effect red litmus but turn blue litmus into red
119. (c); In a gas, the particles are very far away from each other, so there is a lot of space for the particles to be compressed down in to. Thus Gases are highly compressable. This is very helpful when transporting gases in containers
120. (c); A greenhouse gases are combination of gases in an atmosphere that absorbs and emits radiation within the thermal infrared range. This process is the fundamental cause of the greenhouse effect. The main Greenhouse Gases are Carbon di oxide, Methane, Ozone, Water vapour etc
121. (d); Sodium hydroxide reacts with metal to release hydrogen gas. The metal takes the oxygen atom from sodium hydroxide, which in turn takes the oxygen atom from the water, and releases the two hydrogen atoms. The reaction thus produces hydrogen gas
122. (c); Calcium hydroxide base is present in lime water
123. (c); Redox reaction is the reaction in which oxidation and reduction occurs simultaneously. Rust of iron is nothing but hydrate of iron oxide and iron (III) oxide - hydroxide
124. (c); A cation is a positively-charged ion, while an anion is negatively charged. Sulphate is an anion
125. (c); Smog is a type of air pollutant. It is composed of nitrogen oxides, sulphur oxides, ozone, smoke or particulates among others (less visible pollutants include carbon monoxide, CFCs and radioactive sources)
126. (d); The balance equation for the combustion of magnesium (combination / synthesis reaction) is:  

$$2\text{Mg} + \text{O}_2 = 2\text{MgO}$$
127. (c); When an acid and a base are placed together, they react to neutralize the acid and base properties, producing a salt. This reaction is called Neutralisation
128. (a); Galvanisation is the process of applying a protective zinc coating to iron or steel, to prevent rusting. The most common method is hot dip galvanizing, in which steel sections are submerged in a bath of molten zinc
129. (a); Dry ice, sometimes referred to as "cardice", is the solid form of carbon dioxide. It is used primarily as a cooling agent. Its advantages include lower temperature than that of water ice and not leaving any residue. It is useful for preserving frozen foods where mechanical cooling is unavailable
130. (d); In an acid base reaction water is produced along with salt
131. (a); Melting or fusion is a physical process that results in the phase transition of a substance from a solid to a liquid
132. (d); Aluminum is the most abundant metal in the earth's crust, it is never found free in nature. All of the earth's aluminum has combined with other elements to form compounds
133. (b); Pedalfer is composed of high amount of aluminum and iron oxides. It is a subdivision of the zonal soil order comprising a large group of soils in which sesquioxides increase relative to silica during soil formation. Pedalfers usually occur in humid areas
134. (d); Noble Gases are all odorless, colorless, monatomic gases with very low chemical reactivity. The six noble gases that occur naturally are helium (He), neon (Ne), argon (Ar), krypton (Kr), xenon (Xe), and the radioactive radon (Rn)
135. (a); Ozone(O<sub>3</sub>) is a very reactive allotrope of oxygen that is destructive to materials like rubber and fabrics and is also damaging to lung tissue if present in lower atmosphere. But in upper atmosphere Ozone absorbs ultraviolet and functions as a shield for the biosphere against damaging effects of solar UV radiation
136. (d); Hydrogen Bond is weakest bond between atoms. Occur in molecules that have covalent bonds. Sometimes the electrons are not equally shared; one atom tends to have an electron more often than the other atom. In this situation one atom of the molecule becomes partly negative and the other then



- becomes partly positive. This is especially common between water molecules
137. (d); When an acid and a base are placed together, they react to neutralize the acid and base properties, producing a salt. The H (+) cation of the acid combines with the OH (-) anion of the base to form water
138. (a); An exothermic reaction is a chemical reaction that releases energy by light or heat
139. (b); Chemical formula for Sodium Chloride (common salt) is NaCl
140. (d); Carbon di oxide contributes the maximum to the phenomena of global warming. The increase in atmospheric Carbon di oxide and other greenhouse gases has increased the amount of infrared radiation absorbed and re-emitted by these molecules in the atmosphere and thus increases temperature
141. (c); Potassium nitrate is one of the most used chemicals in fireworks. It is the oxidizing (oxygen-supplying) component of black powder which is the base for many pyrotechnic formulations
142. (d); Diamond and Graphite are allotrope of Carbon while ozone is an allotrope of oxygen. Steel is an alloy of iron and carbon with trace amounts of other elements
143. (c); The majority of the world's PET (Polyethylene terephthalate) production is for synthetic fibres and bottle production. In the context of textile applications, PET is referred to by its common name, polyester, whereas the acronym PET is generally used in relation to packaging
144. (a); For oxygen, a molecule consists of two oxygen atoms, and has a weight of  $2 \times 16 = 32$ . For carbon dioxide, there is one carbon atom (weight 12) and two oxygen atoms (mass  $16 \times 2$ ) for a total of 44. This means that carbon dioxide should be about  $44/32 = 1.375$  times (ideally) as heavy as an equivalent volume of oxygen. In reality, carbon dioxide is 1.383 times as heavy as oxygen. Even after solidification carbon di oxide is slightly heavier than similar volume of solid oxygen
145. (b); The acid produced by ants is called formic acid. The name comes from the Latin word for ant, which is "formica." Chemically, it is a simple carboxylic acid
146. (c); A type of colloid, of the form of one solid dispersed in another continuous solid is called Solid sol. Coloured Gems is an example of solid sol
147. (a); The process of loosing electrons is known as Oxidation
148. (b); Anions are atoms or radicals (groups of atoms), that have gained electrons. Since they now have more electrons than protons, anions have a negative charge. For example, Chloride ions Cl-, Bromide Br-, Iodide I-
149. (c); Acid rain results when sulfur dioxide (SO<sub>2</sub>) and nitrogen oxides (NOX) are emitted into the atmosphere and transported by wind and air currents. The SO<sub>2</sub> and NOX react with water, oxygen and other chemicals to form sulfuric and nitric acids. These then mix with water and other materials before falling to the ground
150. (b); Isobars are atoms (nuclides) of different chemical elements that have the same number of nucleons. In other words, isobars differ in atomic number (or number of protons) but have the same mass number. An example of a series of isobars would be <sup>40</sup>S, <sup>40</sup>Cl, <sup>40</sup>Ar, <sup>40</sup>K, and <sup>40</sup>Ca
151. (b); Pitchblende is a radioactive, uranium-rich mineral and ore. It has a chemical composition that is largely UO<sub>2</sub>, but also contains UO<sub>3</sub> and oxides of lead, thorium, and rare earth elements. It is known as pitch blende due to its black color and high density
152. (b); The term endothermic process describes a process or reaction in which the system absorbs energy in the form of heat
153. (b); Cryollite is an ore of aluminium, Galena is an ore of lead, Cinnabar is an ore of mercury and Epsom Salt is an ore of magnesium
154. (b); Reduction is the loss of oxygen from a molecule or the gaining of one or more electrons
155. (d); Most incandescent bulbs use tungsten (W) as a filament element. Tungsten is an inexpensive metal that has a long lifespan as a filament. It is a suitable option for incandescent bulbs because it has an extremely high melting point and is flexible. Pliable tungsten filaments are easily formed and hold up well against temperatures as high as 4,500 degrees Fahrenheit
156. (b); Dynamite is an explosive made of nitroglycerin, sorbents (such as powdered shells or clay) and stabilizers. It was invented by the Swedish chemist and engineer Alfred Nobel in Geesthacht, and patented in 1867. It rapidly gained wide-



- scale use as a safer alternative to black powder
157. (c); Half life of any radioactive substance is the amount of time required for the quantity / weight of the substance to fall to half its initial value. So after one half life, we will have  $\frac{1}{2}$  or 50% of the substance remaining. And after 2 half lives, we will have  $\frac{1}{4}$  of the substance remaining. In other words,  $\frac{3}{4}$  of the substance will take two half lives to decay. As one half life is given as 6 months, so the substance will take 12 months to decay by  $\frac{3}{4}$  th quantity by weight
158. (c); Human Blood pH is regulated to stay within the narrow range of 7.35 to 7.45, making it slightly basic
159. (a); Milk has a pH of around 6.5 to 6.7, which makes it slightly acidic
160. (d); An emulsion is a mixture of two or more liquids that are normally immiscible (unmixable or unblendable). Except Curd all other are example of emulsion
161. (c); Calcium hypochlorite is an inorganic compound with formula  $\text{CaOCl}_2$ . As a mixture with lime and calcium chloride, it is marketed as chlorine powder or bleach powder for water treatment and as a bleaching agent. Common name of  $\text{CaOCl}_2$  is Bleaching Powder
162. (a); The elements in each group have the same number of electrons in the outer orbital. Those outer electrons are also called valence electrons. They are the electrons involved in chemical bonds with other elements
163. (b); Nickel allergy is a common cause of allergic contact dermatitis – an itchy rash that appears where your skin touches a usually harmless substance
164. (c); Most liquids that conduct electricity are solutions of acids, bases and salts
165. (a); Milk of magnesia is the suspension of base Magnesium hydroxide  $\text{Mg}(\text{OH})_2$  in water
166. (a); An antacid is a substance which neutralizes stomach acidity, used to relieve heartburn, indigestion or an upset stomach
167. (c); Potassium is highly reactive and rapidly oxidizes in air, so inspite of its property of malleability it cannot be beaten into sheets
168. (b); Minamata disease is a poisoning disease that affects mainly the central nervous system and is caused by the consumption of large quantities of fish and shellfish contaminated with mercury
169. (a); Phenol, also known as carboic acid, is an aromatic organic compound with the molecular formula  $\text{C}_6\text{H}_5\text{OH}$
170. (b); Electron was discovered by J. J. Thomson in 1897 when he was studying the properties of cathode ray
171. (a); An aerosol is a colloid of fine solid particles or liquid droplets, in air or another gas. Examples of natural aerosols are fog, dust, forest exudates, clouds, mist and geyser steam
172. (d);  $\text{CaO}$  is a chemical formula of quicklime
173. (d); The principal organic acid found in grapes is Tartaric Acids
174. (b); Artificial silk is any synthetic fiber which resembles silk, but typically costs less to produce. Rayon fibre is also called as artificial silk
175. (a); An exothermic reaction is a chemical reaction that releases energy by light or heat. It is the opposite of an endothermic reaction. Expressed by chemical equation: reactants  $\rightarrow$  products + energy
176. (a); Brass is a metallic alloy that is made of copper and zinc. Brass is commonly used for decorative purposes primarily because of its resemblance to gold. It is also a commonly used to make musical instruments due to its high workability and durability.
177. (b); Bronze Alloy is an alloy composed of copper and tin
178. (b); Fly ash is a byproduct from burning pulverized coal in electric power generating plants. During combustion, mineral impurities in the coal (clay, feldspar, quartz, and shale) fuse in suspension and float out of the combustion chamber with the exhaust gases. As the fused material rises, it cools and solidifies into spherical glassy particles called fly ash
179. (a); The common name of Sodium Bicarbonate is Baking Soda. Sodium bicarbonate is a chemical compound with the formula  $\text{NaHCO}_3$
180. (a); Dolomite is an ore of Magnesium; Epsom salt is an ore of Magnesium and sulphur; Galena is an ore of lead and Siderite is an ore of iron
181. (a); Rusting is the process of rust forming on iron. In rusting, the red or orange coating that forms on the surface of iron when exposed to air and moisture, consisting



- chiefly of ferric hydroxide and ferric oxide formed by oxidation
182. (b); The stratosphere is the second major layer of Earth's atmosphere, just above the troposphere, and below the mesosphere. Ozone in the stratosphere absorb ultraviolet light from the Sun, providing a shield that prevents this radiation from passing to the Earth's surface
183. (b); Stainless Steel is made by mixing iron with carbon and metals like chromium, nickel and manganese
184. (c); The melting point of a solid is the temperature at which it changes state from solid to liquid at atmospheric pressure. The melting point of ice is 273.16 K
185. (c); A fire extinguisher is an active fire protection device used to extinguish or control small fires, often in emergency situations. They contain pure carbon dioxide which is a clean extinguishant, leaving no residue. Suitable for flammable liquid fires (petrol, oil, solvents), and recommended for use on live electrical equipment
186. (c); When the magnesium metal burns it reacts with oxygen found in the air to form Magnesium Oxide. Oxygen and magnesium combine in a chemical reaction to form this compound. After it burns, it forms a white ash of the magnesium oxide
187. (a); The salt concentration (measured as salinity in parts per thousand), is less than 5 % in inland waters
188. (c); Salt is obtained from seawater by process of evaporation
189. (d); The passage of an electric current through a conducting liquid causes Chemical Reaction
- 190 (b); Sulphurous acid is the chemical compound with the formula  $H_2SO_3$
- 191 (d); When iron is exposed to water or air over a period of time, the iron reacts with oxygen in the presence of moisture to form a reddish-brown chemical compound, iron oxide. This is referred to as rust
192. (d); The substances which have very low ignition temperature and can easily catch fire with a flame are called inflammable substances. Examples of inflammable substances are petrol, alcohol, Liquefied Petroleum Gas (LPG), etc
193. (a); Blue Vitriol is another name for Copper Sulphate
194. (d); The rubbing surface of a matchbox has powdered glass and a little red Phosphorus
195. (a); Crystallisation is an example of physical change
196. (b); The reaction between baking soda (sodium bicarbonate) and vinegar (dilute acetic acid) generates carbon dioxide gas
197. (b); Seawater in the world's oceans has a salinity of approximately 3.5% or 35 parts per thousand
198. (d); Fabric made from Polyester does not get wrinkled easily
199. (b); Calcium Carbonate is formed when  $CO_2$  is passed through lime water
200. (b); By volume, Nitrogen is the largest component of the lower atmosphere
201. (a); Acetic acid is also known as vinegar
202. (d); The reaction of Copper Sulphate and Iron produces Iron Sulphate and Copper. It is a single displacement reaction
203. (d); Nylon is an artificial fibre. It has high tensile strength, stiffness, excellent heat deflection temperature, and superior abrasion and wear resistance. Nylon thread is actually stronger than a steel wire
204. (a); Electroplating is the process of plating(depositing) one metal onto another by means of electricity, most commonly for decorative purposes or to prevent corrosion of a metal
- 205 (a); Anthracite is a hard, compact variety of coal that has a submetallic luster. It has the highest carbon content (>90%), the fewest impurities, and the highest energy density of all types of coal except for graphite
- 206 (a); Bee stings contains an acidic solution. Bee venom contains formic acid (also known as methanoic acid)
- 207 (d); In semiconductor physics, a donor is a dopant atom that, when added to a semiconductor, can form a n-type region. All except aluminium are donor atom
- 208 (b); 0 K is equivalent to  $- 273^\circ C$
- 209 (c); Carbon gives hardness to Stainless Steel
- 210 (a); Lead Sulphate is not soluble in water
- 211 (c); Activated Charcoal is used to remove colouring matter from pure substances by adsorption
- 212 (d); Chernobyl disaster is the result of pollution by radioactive wastes. Which occurred on 26 April 1986 in Ukrainian Soviet Socialist Republic which was part of Soviet Union
- 213 (b); Heat is transmitted from higher temperature to lower temperature through



- the actual motion of the molecules in both conduction and convection
- 214 (b); Silver react with Hydrogen Sulphide in air to form Silver Sulphide. This is corrosion of silver
- 215 (b); Uranium is a radioactive element. Uranium is a chemical element with symbol U and atomic number 92
- 216 (c); Silica gel is a granular, vitreous, porous form of silicon dioxide made synthetically from sodium silicate. It is mainly used as a drying agent
- 217 (b); Ultraviolet radiation in the stratosphere is absorbed by Ozone
- 218 (c); All isotopes of the same element have the same atomic number but different atomic masses
- 219 (a); Some precious metals such as pure gold and platinum do not react with nitric acid. Pure gold does react with aqua regia a mixture of concentrated nitric acid and hydrochloric acid
- 220 (a); Nitrous oxide, commonly known as laughing gas or nitrous, is a chemical compound, an oxide of nitrogen with the formula  $N_2O$ . At room temperature, it is a colorless non-flammable gas, with a slight metallic scent and taste.
- 221 (c); Sewage sludge refers to the residual, semi-solid material that is produced as a by-product during sewage treatment of industrial or municipal wastewater
- 222 (a); Every type of particle has a corresponding antiparticle, for example; the positron is the antiparticle of the electron. the antiproton is the antiparticle of the proton. the antineutron is the antiparticle of the neutron. the antineutrino is the antiparticle of the neutrino
- 223 (d); Non-stick cookware is a common application, where the non-stick coating allows food to brown without sticking to the pan. Non-stick is often used to refer to surfaces coated with "Teflon."
- 224 (c); Aerosol is a system of solid or liquid particles suspended by a mixture of gases. The term aerosol covers a wide spectrum of small particles, like sea salt particles, mineral dust, pollen, drops of sulphuric acid and many others
- 225 (d); Briquetting technology is used to densify the loose combustible materials into solid composites of different shapes and sizes
- with the presence of pressure and binding agents
- 226 (c); Nuclear fusion is a nuclear reaction in which two or more atomic nuclei (e.g. D+T) collide at a very high energy and fuse together
- 227 (c); Most abundant element is Oxygen followed by Silicon. Both of these are non-metal. Silicon is followed by Aluminium which is most abundant metal
- 228 (d); The chlorine gas is used to react with the caustic soda in preparation of bleaching powder
- 229 (c); The ozone layer is a region of Earth's stratosphere that absorbs most of the Sun's ultraviolet (UV) radiation. The depletion in Ozone layer is caused by Chlorofluorocarbons
- 230 (c); When water itself combines chemically with some element or mineral called hydration.
- 231 (a); Ozone ( $O_3$ ), or trioxygen, is a triatomic molecule, consisting of three oxygen atoms.
- 232 (a); A transistor is a semiconductor device used to amplify and switch electronic signals and electrical power. Silicon and germanium are semiconductors which are widely used in transistors.
- 233 (d); Lignite, often referred to as brown coal, is a soft brown fuel with characteristics that put it somewhere between coal and peat. It is considered the lowest rank of coal due to its relatively low heat content. It has a carbon content around 60–70 percent
- 234 (b); The main constituent of biogas is methane. Biogas comprises primarily methane ( $CH_4$ ) and carbon dioxide ( $CO_2$ ) and may have small amounts of  $H_2S$ ,  $H_2O$  (moisture)
- 235 (b); The pH of human blood is between 7.35 to 7.45.
- 236 (b); Sour taste of 'Coca Cola' is due to the presence of additive E338. Additive E338 contains phosphoric acid. It is used to acidify foods and beverages.
- 237 (d); Calcium carbide ( $CaC_2$ ) reacts with water gas to produce acetylene gas ( $C_2H_2$ )  
 $CaC_2(s) + 2H_2O \rightarrow C_2H_2(g) + Ca(OH)_2(g)$
- 238 (b); Greenhouse effect is caused by Carbon dioxide
- 239 (b); Citric Acid is mainly present in Lemon
- 240 (b); Tear gas used by the police to disperse the mob contains Chlorine
241. (c); A continent sized hole (thinning) has been formed over Antarctica as a result of damage to ozone.



242. (c); The tip of the match-stick contains Red Phosphorus
243. (c); Zinc Phosphides is commonly used as Rodenticides. They are a category of pest control chemicals intended to kill rodents
244. (d); Aspirin, also known as Acetyl Salicylic acid (ASA), is a medication used to treat pain, fever, or inflammation
245. (d); At absolute zero the gas molecules stop their movement or we can say that molecular kinetic energy will become zero
246. (d); Silver(I) nitrate reacts with acetylene to produce silver(I) acetylide and hydrogen chloride.  

$$2\text{AgNO}_3 + \text{C}_2\text{H}_2 \rightarrow \text{Ag}_2\text{C}_2 + 2\text{HNO}_3$$
Hence,  $\text{C}_2\text{H}_2$  shows acidic property
247. (d); Hydrogen bomb is based on the principle of fusion reaction. It is an uncontrolled reaction.
248. (a); The technique of calculating the age of fossil organisms is radiocarbon dating developed by Willard Libby and his colleagues in 1949.
249. (d); Einstein's greatest role in the invention of the atomic bomb was signing a letter to President Franklin Roosevelt urging that the bomb be built. The physicist Albert Einstein did not directly participate in the invention of the atomic bomb, he was instrumental in facilitating its development
250. (d); Major gaseous pollutant of the thermal power station is  $\text{SO}_2$
251. (d); The meaning of the word hydrophilic is water loving. Thus, a substance which readily forms colloidal solution in contact with water is called hydrophilic colloid.
252. (d); Radioactive disintegration of uranium ultimately results in the formation of lead.
253. (c); Melting point of different metals are- Copper  $1083^\circ\text{C}$ , Gold  $1063^\circ\text{C}$ , Silver  $951^\circ\text{C}$  and Mercury  $-38.83^\circ\text{C}$
254. (b); Nuclear forces are short range attractive forces that bound the nucleus against the repulsive electrostatic force between Proton.
255. (d); Wrought iron contains 0.12 to 0.25% carbon and it is the purest form of iron
256. (a); Now-a-days yellow lamps are frequently used as street lights. Sodium gas is used as street lamp
257. (b); The mineral pyrite, or iron pyrite, is an iron sulphide with the molecular formula  $\text{FeS}_2$ . Pyrite is used in commercial production of sulphur dioxide, for use in the paper industry and in the manufacture of sulphuric acid.
258. (c); Air contains 78% of nitrogen which is heavier than helium. Therefore, a balloon filled with helium rises in air because helium is less dense than air.
259. (d); German silver is an alloy of having 60% copper, 20% nickel and 20% zinc. It is also known as Nickel Silver. Nickel silver is named for its silvery appearance, but it contains no silver
260. (a); The following metals impart different colour to glasses- Cobalt oxide: deep blue colour; copper oxide: turquoise; chromium: dark green to black; cadmium sulphide: deep yellow etc.
261. (c); A continent sized hole (thinning) has been formed over Antarctica as a result of damage to ozone.
262. (b); When sulphur pollutants fall on to buildings made from limestone and sandstone they react with minerals in the stone to form a powdery substance that can be washed away by rain. This is known as acid rain. The Taj Mahal in India has been damaged by this.
263. (d); Nitrogen is not a greenhouse gas but it is a main component of air. 78% of air is  $\text{N}_2$  gas.
264. (c); Chromium is the toxic heavy metal and is mainly found in waste from the chrome tanning process; it occurs as part of the retaining system and is displaced from leathers during retaining and dyeing processes.
265. (c); The main source of carbon monoxide is burning of fossil fuel. The combustion of petroleum in automobiles is incomplete due to which smoke is produced. This smoke contains carbon monoxide.
266. (c); A special characteristic of charcoal is power to remove substances from solution. A brown solution of raw sugar is decolourised when boiled with charcoal.
267. (c); Iodised salt is beneficial for thyroid function because iodine is required for the synthesis of a hormone called thyroxine.
268. (b); Most submarines except nuclear ones have diesel-electric engines
269. (b); Bagasse is the fibrous matter that remains after sugarcane or sugarbeet stalks are crushed to extract their juice.
270. (b); Hydro electricity is often known as White coal.
271. (d); The resources which can be used continuously, year-after are called Renewable resources



- 272 (c); The tip of the match stick contains Red Phosphorus
- 273 (b); The anode in a dry cell consists of Zinc
- 274 (c); A fluorescent lamp or fluorescent tube is a gas discharge lamp that uses electricity to excite mercury vapour. It contains Mercury Vapour and Argon
- 275 (a); The most abundant element on earth's surface after Oxygen is Silicon. It was discovered by J.J. Berzelius in 1824. The word 'Silicon' was taken from the Latin word *silex*. Silicon chips are used as a semiconductor in computers.
- 276 (a); A group of gypsum cement, essentially hemihydrated Calcium Sulphate ( $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$ ), a white powder that forms a paste when it is mixed with water and then hardens into a solid used in making a cast, mould and sculpture.
- 277 (a); Bronze is an alloy made up of Copper and another metal Tin. Compositions may vary but most modern bronze is 88% Copper and 12% Tin
- 278 (b); Brass consists 68–71% Copper and rest is Zinc. Bronze consists 88% Copper and 12% Tin. German silver has almost 50% Copper. Delta consists 60% Copper, 38% Zinc, 2% Fe
- 279 (b); Brass consists 68–71% Copper and rest is Zinc. Bronze consists 88% Copper and 12% Tin. German silver has almost 50% Copper. Gunmetal consists 85% Copper, 5% Tin, 5% Lead, 5% Zinc.
- 280 (c); Stainless steel alloy with a minimum of 10.5% Chromium content by mass. The presence of Chromium protects steel from corrosion, rust and make it high-temperature resistance.
- 281 (c); During hydrogenation, the vegetable oils are reacted with hydrogen gas. A nickel catalyst is used to speed up the reaction. The double bond is converted to single bond in the reaction. In this way, the unsaturated fats can be made into saturated fats.
- 282 (b); Sulphur hexafluoride ( $\text{SF}_6$ ) is an inorganic, colourless, odourless and non-flammable compound.  $\text{SF}_6$  has an octahedral shape. It has 12 electrons around the central Sulphur atom. This means there are six electron pairs arranged in an octahedral shape.
- 283 (c); The Lewis acids are lone pair acceptors. The Lewis bases are lone pair donors. Nitrogen in  $\text{NH}_3$  has 5 electrons in which 3 of them are involved in bonding. That leaves one lone pair. This lone pair is available for bonding. Therefore,  $\text{NH}_3$  is a Lewis base.
- 284 (b); Sodium bicarbonate is also known as Baking Soda. The chemical formula of Sodium Bicarbonate is  $\text{NaHCO}_3$
- 285 (d); Dry Ice – We can simply say that Dry ice is solid Carbon dioxide  $\text{CO}_2$ . It is used as a cooling agent.
- Mustard gas – It is used as a strong chemical weapon. This mortally chemical affects skin, leering eye, lungs and D.N.A. which affects the cells most.
- Teflon – Its commercial name is Polytetra Fluoroethylene. Teflon is a Fluorine containing the polymer.
- Fullerene – Fullerene is an allotrope of the carbon family in which fully carbon atoms are integrated. It is denoted by  $\text{C}_{60}$ .
- 286 (d); Lemons are acidic. Any chemical with a pH less than 7 is considered acidic. Lemon juice has a pH around 2.0
- 287 (a); Vinegar consists of acetic acid and water. A small amount of sugar and fruit juice may be added to vinegar as a flavouring agent.
- 288 (b); Gasohol, a gasoline extender made from a mixture of gasoline (90%) and ethanol (10% often obtained by fermenting agricultural crops) or gasoline (97%) and methanol or wood alcohol (3%). Gasohol has higher octane or antiknock properties by which it burns more slowly, coolly and completely.
- 289 (b); Ammonium ( $\text{NH}_4^+$ ) and nitrate ( $\text{NO}_3^-$ ) are the predominant inorganic forms of nitrogen in the soil. Plants normally use nitrogen in the form of nitrate.
- 290 (a); The Actinide series contains elements with atomic numbers 89 to 103 and is the sixth group in the periodic table
- 291 (a); The Isotones are a set of nuclides/atoms having the same number of neutrons, but a different number of protons.
- 292 (d); Chromatography is a separation technique used to separate the different components in a liquid mixture. The purpose of preparative chromatography is to separate the components of a mixture for more advanced use and thus a form of purification.
- 293 (a); Nitrogen gas is usually filled in electric bulb in a small amount with Argon Gas
- 294 (b); Among the metals, gold is the least reactive, so it can be accessed in the native (free) state.
- 295 (a); Coal minerals are divided mainly into four types on the basis of the percentage of Carbon amount-



- Peat - 50-60%, Lignite - 25-35%, Bituminous - 45-85% and Anthracite - more than 85%.
- 296 (a); Polytetrafluoroethylene (PTFE) is usually known as Teflon. PTFE is a solid fluorocarbon. Its density is  $2.2 \text{ g/cm}^3$  and its melting point is  $327^\circ\text{C}$ . This is especially used for making a non-stick surface coating for utensils.
- 297 (a); Nitrous Oxide is commonly known as laughing gas
- 298 (d); RDX, the abbreviation of this word is Research Department Explosive, is also called cyclonite. It is powerful explosive discovered by Georg Friedrich Henning of Germany and patent in 1898 but not used until World War II when most of the warring powers introduced it.
- 299 (b); Silicon and germanium are frequently used for making transistors
- 300 (b); Brass gets discolored because of the presence of Hydrogen Sulphide in air
- 301 (c); Potassium Cyanide (KCN) or Zinc Phosphide is a highly toxic chemical used as a rodenticide - a poison to kill the mouse.
- 302 (b); Bromine is the only non metal and Mercury only metal, liquid at room temperature
- 303 (c); This theory was given by Willard Frank Libby in 1949. To determine the age of wood and bones (the time which elapsed after the death of plant) is called Ratio Carbon Dating. The Half-life of Carbon 14 is  $5,730 \pm 40$  years.
- 304 (c); Pairs is correctly matched as such-  
Silver Iodide - Artificial rain, Silver Chloride - Horn Silver, Zinc Phosphide - Rat poison, Zinc Oxide - Philosopher's wool
- 305 (b); Neutron is a neutral particle which has no electrical charge. It was discovered by Chadwick in 1932.
- 306 (b); Change of water into the vapour is called a physical change
- 307 (c); Among non-metals, diamond is the hardest whereas, among the metals, platinum is the hardest
- 308 (a); There are 2 types of street light bulbs are used by municipalities. They are sodium vapor and mercury vapor bulbs. The mercury vapor bulbs are usually a white ambient light and sodium on orange/yellow light.
- 309 (d); Mica is good conductor of heat and bad conductor of electricity so mica use in electrical industry
- 310 (c); Bauxite is an ore of Aluminum, which is found in the form of Hydrated Aluminium Oxides.
- 311 (b); The common composition of solder is 32% Tin, 68% Lead. This combination has a low melting point and is useful for soldering components that are sensitive to heat
- 312 (d); Diamond is an additional form of Carbon. Its relative density is 3.5 Graphite is a slaty-black coloured smooth and brightly organic matter of relative density 2.25, while coal is a solid organic matter used as fuel. All the three are consist of carbon.
- 313 (b); Hydrogen is the purest combustion fuel. Water is generated from burning of Hydrogen. While coal, kerosene oil and diesel are known as fossil fuel which generates, Carbon dioxide and many other harmful gases when it burns
- 314 (b); Chlorine is presently an important chemical for water purification (such as in water treatment plants), disinfectants and in bleach.
- 315 (a); Nitrous Oxide ( $\text{N}_2\text{O}$ ) is also known as laughing gas. It is a colourless gas with a sweet odour and taste. It is also used as the anesthetic gas.
316. (a); Nila thotha is a compound of Copper and sulphate. Its chemical formula is  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$
317. (c); The organic compounds are a large class of chemical compounds in which one or more atoms of carbon are covalently linked atoms of other elements, most commonly Hydrogen, Oxygen or Nitrogen
- 318 (d); Acetic acid is the chief component of vinegar. Vinegar is liquid consisting mainly of acetic acid ( $\text{CH}_3\text{COOH}$ ) and water.
- 319 (c); Tetraethyl Lead ( $(\text{CH}_3\text{CH}_2)_4\text{Pb}$ ) is the chief antiknock agent for automotive gasoline or petrol.
- 320 (b); Electrolyte substance used in a car battery is Sulphuric acid ( $\text{H}_2\text{SO}_4$ ). It is a strong acid.
- 321 (c); The best example of changing into electric energy from chemical energy is primary cells or batteries, the dry cell is also made up in this phenomenon.
- 322 (c); Urine odour is caused by the presence of Ammonia. Urine is an aqueous solution of greater than 95% water.
- 323 (c); Potassium Cyanide (KCN) or Zinc Phosphide is a highly toxic chemical used as a rodenticide a poison to kill the mouse.



- 324 (a); Carbon dioxide gas is used in a fire extinguisher to control small fires, often in emergency situations.
- 325 (a); Soap is a combination of animal fat or plant oil and caustic soda. Many vegetable fats including olive oil, palm kernel oil and coconut oil are also used in soap making.
- 326 (b); Milk contains a sugar called lactose. It also contains harmless bacteria called lactobacillus, which uses glucose for energy and creates lactic acid as a by-product. It is the lactic acid which makes the milk sour. The presence of lactic acid or lactate in milk is due to the fermentation of lactose caused mainly by lactic bacteria.
- 327 (c); The chemical formula of Sodium Benzoate is  $\text{NaC}_7\text{H}_5\text{O}_2$ . It is widely used as food preservative
- 328 (c); Methane is the principal gas in biogas. It is also the main component of natural gas, a fossil fuel, can be used to replace natural gas in many applications including cooking, heating, steam production, etc.
- 329 (d); Fossil fuels, including coal, oil and natural gas are currently the world's primary energy sources.
- 330 (c); Lactic acid is found in curd not Acetic acid. Formic acid occurs in the body of red ants and in the stings of bees.
- 331 (a); Bullet-resistant glass is made or manufactured by using polycarbonate, thermoplastic and layers of laminated glass.
- 332 (b); Nitrogen gas is used in the tyres of an aeroplane. This is because the nitrogen gas does not support combustion and can assist in preventing wheel fire when the aircraft lands
- 333 (a); Coal minerals are divided mainly into four types on the basis of the percentage of Carbon amount- Peat, Lignite, Bituminous and Anthracite.
- 334 (b); It is an extension of the older carat (Karat in North American spelling) system of denoting the purity of gold by fractions of 24, such as '18 carat' for an alloy with 75% (18 parts per 24) pure gold by mass.
335. (d); Proton, electron and neutron are part of an atom. These particles are also known as three fundamental particles, but the photon is associated with light energy and also known as energy packet of light.
- 336 (b); The mass number of an element is the sum of a total number of protons and neutrons inside in its nucleus and represents by A. Therefore, mass number  $A = \text{number of proton} + \text{number of neutron}$ . Therefore, mass number  $= 2 + 2 = 4$
- 337 (c); In order to pasteurize milk, first, the milk is heated up to a longer time and then cooled suddenly within specified time. Pasteurization is a process invented the by French Scientist Louis Pasteur during the nineteenth century.
- 338 (c); Rainwater is purest form of water. Its pH value is 7
- 339 (c); The noble gases make a group of chemical elements with similar properties under standard conditions, they are all odourless, colourless, monatomic gases with very low chemical reactivity. The six noble gases that occur naturally are Helium (He), Neon (Ne), Argon (Ar), Krypton (Kr), Xenon (Xe) and the radioactive Radon (Rn).
- 340 (b); High resolution photographic plates having a coating of exceedingly fine-grained photosensitive emulsions with sub microscopic crystals of silver bromide in gelatin.
- S341 (b); Paddy fields are a major source of atmospheric methane
- 342 (b); Polytetrafluoroethylene (PTFE) is usually known as Teflon. This is especially used for making a non-stick surface coating for utensils.
- 343 (a); Tri Nitro Glycerin (TNG) also known as Nobel Oil, is an explosive fluid.
- 344 (c); The use of natural gas in power generation provides a cleaner alternative to coal and other fossil fuels
- 345 (c); Aspirin is a salicylate. It works by reducing substances in the body that cause pain, fever and inflammation. It is obtained from tree.
- 346 (d); Cloud seeding is the process of spreading either dry ice or more commonly silver Iodide into the upper part of clouds to try to stimulate the precipitation process and form rain.
- 347 (b); The safety matchbox ignites due to the extreme reactivity of phosphorus with the potassium chlorate on the match head. Phosphorus is a highly reactive, non-toxic-chemical used for making the head of a matchstick.
- 348 (c); Humus usually refers to the natural decay of material such as leaves in the soil's top layer. It is a dark organic material that forms



- in the soil when plant and animal matter decays.
- 349 (a); Aluminium sulphate is used in 'foam' fire extinguishers, which contains radium bicarbonate and aluminium sulphate in separate receptacles on being mixed they form the foam of bubbles of CO<sub>2</sub>
- 350 (a); The Bhopal Gas tragedy happened on 2-3 December 1984 at night.
- 351 (a); The correctly matched are as follows:  
Technology Day -11 May (Pokharan test 1998)  
Photography Day - 19 August  
National Sports Day -29 August (Major Dhyanchand)  
Nagasaki day -9 August (Nagasaki Japan atom bomb)
- 352 (d); Eosin is a Tetrabromofluorescein. Most red inks are dilute solution of the red dye eosin.
- 353 (d); Uranium-lead dating is one of the oldest and most refined methods to determine the age of the earth, decaying rocks and bones.
- 354 (c); The idea for carbon credits came from the Kyoto Protocol of 1997. This is placing a monetary value on the cost of polluting the air. A single carbon credit generally emits one metric ton(1,000 kg or 2,204 pounds) of carbon dioxide or the equivalent mass of another greenhouse gas.
- 355 (c); Detergent easily removes oil and dirt from dirty garment as the surface tension of water is dramatically reduced by the addition of soap or detergent.
- 356 (c); An emulsion is a colloid of two or more immiscible liquids where one liquid contains a dispersion of the other liquids. Milk is an example of an emulsion
- 357 (a); CNG is made by compressed natural gas which is mainly composed of Methane (CH<sub>4</sub>).
- 358 (a); The cow dung or gobar gas has a lot of energy which can be stored for a biogas plant by the process of fermentation.
- 359 (d); Nitrochloroform is used as anaesthetics before the operation of the patient to make them unconscious. Other options are explosive.
- 360 (b); The Octane number of a fuel is the measure of its antiknock quality when it is used in a spark ignition, internal combustion engine as compared to the antiknock quality of ISO-octane. The higher octane number of a fuel means the better antiknocking capacity for that fuel.
- 361 (b); The compounds formed after reaction between the strong base and strong acid are known as neutral salt. Sodium chloride (NaCl) is an example of neutral which is salt also known as Table Salt.
- 362 (a); Heliox is a breathing gas composed of a mixture of Helium (He) and Oxygen (O<sub>2</sub>). This is frequently used for respiration by divers in the deep sea.
- 363 (b); Heavy water (D<sub>2</sub>O) Deuterium Oxide is used as a moderator and coolant in nuclear reactors because it slows down neutrons effectively and also has a low probability of absorption of neutrons.
- 364 (a); The nucleus is a very dense region consisting of protons and neutrons at the centre of an atom. It was discovered in 1911 as a result of Ernest Rutherford's interpretation of the 1909 Geiger-Marsden gold foil experiment.
- 365 (d); The Isotopes are a set of nuclides/atoms having the same number of protons, but a different number of neutrons. In other words, the same atomic number having different atomic mass.
- 366 (b); Radioactivity was discovered in 1896 by the French Scientist Henri Becquerel when he was working with phosphorescent materials.
- 367 (a); The element found the maximum in the soil layer is Oxygen 46.8% followed by Silicon 27.2%, Calcium 3.65% and Carbon 0.6%.
- 368 (d); Potassium is the most reactive metal.  
Reactivity series (or Electrochemical Series) of metals Most reactive  
Potassium (K)  
Sodium (Na)  
Barium (Ba)  
Calcium (Ca)  
From the above reactivity series, we can see that Potassium is the most reactive metal.
- 369 (c); Fluorescent lamp tube is filled with a gas containing low pressure mercury vapour and Argon. Sometimes gases like Xenon, Neon or Krypton can also be used. The pressure inside the lamp is around 0.3% of atmospheric pressure.
- 370 (a); Limestone is a sedimentary rock composed largely of the minerals Calcite and Aragonite which are different crystals form



- of Calcium Carbonate ( $\text{CaCO}_3$ ). Limestone binds with silica and other impurities to remove them from the iron.
- 371 (b); Monazite is an important ore for Thorium, Lanthanum and Cerium. India, Madagascar and South Africa have large deposits of monazite sands.
- 372 (d); Galvanization is the process of applying protective zinc coating to steel or iron to prevent rusting
- 373 (a); Bronze is an alloy made up of Copper and another metal Tin. Compositions may vary but most modern bronze is 88% Copper and 12% Tin.
- 374 (c); Dry ice sometimes referred to as solid  $\text{CO}_2$  or dry snow is the solid form of Carbon dioxide.
- 375 (b); A mixture of methanol (a liquid) and water (a liquid) is homogeneous
- 376 (b); Polymerization is the process of joining together a large number of small molecules to make a number of the very large molecule. Natural rubber is the natural polymer of Isoprene.
- 377 (d); Tartaric acid is the predominant organic acid in grapes.
- 378 (a); The heating value of a fuel is the amount of heat that is obtained after one gram (1gm) of fuel is burnt completely in air or oxygen. Hydrogen has the highest heating value among all fuels. Hydrogen is used as a rocket fuel and in burner producing high temperature.
- 379 (c); LPG is the abbreviation or short form Liquefied Petroleum Gas. Like all fossil fuels, it is a non-renewable source of energy. It is extracted from crude oil and natural gas. The normal components of LPG thus are propane ( $\text{C}_3\text{H}_8$ ) and butane ( $\text{C}_4\text{H}_{10}$ ).
- 380 (c); Helium- ( $^4\text{He}$ ) is a non-radioactive isotope of the element Helium. Its nucleus is identical to an alpha particle and consists of two protons and two neutrons.
- 381 (b); The Geiger-Muller Counter also called a Geiger Counter, is an instrument used for detection and measurement ionizing radiation.
- 382 (d); Solid camphor directly changes into camphor vapour and this process is called sublimation. The sublimation is the process in which some substances upon heating directly changes into vapour from and when cooled again directly turns into solid form.
- 383 (c); Mercury is the only metal which is liquid at ordinary temperature.
- 384 (c); German Silver or Nickel silver is an alloy consisting 50% Copper, 35% Zinc and 15% Nickel. It doesn't have silver.
- 385 (a); Due to rust, the weight of Iron increases as Iron is converted into-oxide after chemical reaction with Oxygen, in presence of humidity.
- 386 (b); Anodizing is an electrical-chemical process by which the surface of a metal is made durable and rust resistant. In this process, a layer of Aluminium Oxide is deposited on Aluminium.
- 387 (b); The pH value of pure water is 7. Pure water is neutral by nature. The solution with a pH less than 7 are said to be acidic and solutions with a pH greater than 7 are basic or alkaline.
- 388 (a); Hydrogen gas is used in the manufacturing of Vanaspati ghee. To prepare the Vanaspati ghee, hydrogen gas is passed through vegetable oils under 8-10 atmospheric pressure in the presence of nickel powder at a temperature of  $200^\circ\text{C}$ , oil changes into vegetable ghee or solid fat known as Vanaspati ghee.
- 389 (c); Xenon is a chemical gas with symbol Xe and atomic number 54. It is a rare, odourless, colourless, tasteless, chemically unreactive gas. Xenon gas is also known as stranger gas as its volume is low in the atmosphere
- 390 (b); Sodium bicarbonate is also known as Baking Soda. The chemical formula of Sodium Bicarbonate is  $\text{NaHCO}_3$
- 391 (c); Mustard gas or Sulphur mustard is a chemical compound which has been used as a chemical weapon in First World War.
- 392 (a); The Chemical Ethephon is often used on wheat, coffee, tobacco, cotton and rice in order to help the plant's fruit to ripen more quickly.
- 393 (d); Wool, silk, leather are the natural polymers but nylon is not a natural polymer.
- 394 (a); C.N.G. is the short form of compressed Natural Gas.
- 395 (d); Two nuclides are isoneutronic (isotones) if they have the very same neutron number  
As per the question  
 ${}^6\text{C}^{14} = 14 - 6 = 8$  neutron



$7\text{N}_{15} = 15 - 7 = 8$  neutron

$8\text{O}_{16} = 16 - 8 = 8$ neutron

Since the number of neutrons in all is 8 they are all Isotones

- 396 (d); Physical changes affect the form of a chemical substance, but not its chemical composition. In general, a physical change is using physical me. For example, sugar dissolved in water can be recovered by allowing the water to evaporate
- 397 (a); The boiling point of a liquid is the temperature at which its vapour pressure is equal to the pressure of the gas above it. Generally impurities increases the boiling point of liquid

398 (a); Insulin is an antidiabetic drug

399 (a); Mercury is a chemical element with the symbol (Hg). Mercury is used in thermometers due to its special properties. Mercury is good conductor of heat

400 (d); Diamond is Allotrope of Carbon. Marble is a metamorphic rock composed mainly of crystalline calcium Carbonate or Calcium Magnesium Carbonate. The most common component of sand is Silicon dioxide in the form of quartz. Ruby is considered as one of the four precious stones together with Sapphire, Emerald and Diamond. In Chemistry, the ruby gemstone is a mixture of Aluminium, Oxygen and Chromium.

