DOON ACADEMY OF DEFENCE (D.A.D.)

MNS-2020 (Chemistry Questions)

(Note : These questions are memory based. The actual question in exam may vary)

1. **Why does carbon form many compounds?** **[Shift 1]**

   Catenation

   Catenation is the ability of carbon to form long chains. In fact, carbon atoms are unique because of catenation—they are unique among all of the other atoms found in nature. They form tetravalent bonds, which means that 1 carbon atom forms bonds with 4 other carbon atoms. This structure can be repeated endlessly without disturbing the stability of the bonds or the compounds formed, so they have a repeatable structure.

2. **Least paramagnetic material is** **[Shift 1]**

   (a)Fe **(b)Ni**
   (c)Cu **(d)Mn**

   Cu

   No. of unpaired electrons in Mn = 5
   No. of unpaired electrons in Fe = 4
   No. of unpaired electrons in Ni = 2
   No. of unpaired electrons in Cu = 1
   More is the no. of unpaired electrons, higher is paramagnetism.

3. **How can we convert liquid hydrocarbon to gaseous hydrocarbon.** **[Shift 2]**

   Crackling or Pyrolysis

   Lower hydrocarbons exist in gaseous state while higher ones are in liquid state or solid state. On cracking or pyrolysis, the hydrocarbon with higher molecular mass gives a mixture of hydrocarbons having lower molecular mass. Hence, we can say that by cracking a liquid hydrocarbon can be converted into a mixture of gaseous hydrocarbons.

4. **Which have same mass no. but different atomic no.** **[Shift 2]**

   Isobar

   Isobars are atoms of different elements with the same mass number but different atomic numbers. For example, two elements calcium and argon . The number of electrons in these atoms is different, but the mass number of both these elements is 40.

5. **Number of neutrons in heavy water** **[Shift 2]**

   10

   Heavy water has formula D_2O. Each Deutron has atom has 1 neutron , while Oxygen atom has 8 neutrons. So total neutrons are 10.

6. **Separation method for aluminium from alumina ?** **[Shift 2]**

   Electrolysis

   Electrolysis is the process by which ionic substances are decomposed (broken down) into simpler substances when an electric current is passed through them. Electricity is the flow of electrons or ions. For electrolysis to work, the compound must contain ions.
   Electrolysis is used in industry for the production of many metals and non-metals (e.g., aluminium, magnesium, chlorine, and fluorine).

7. **Transition metals are catalyst because** **[Shift 2]**

Transition metals show catalytic behaviour mainly due to the presence of vacant d orbitals, they have the ability to exhibit variable valencies and they have a tendency to form complex compounds.

8. When we add catalysts to the reaction we increases its [Shift 3]

Rate of reaction

Catalysts are substances that increase reaction rate by lowering the activation energy needed for the reaction to occur. A catalyst is not destroyed or changed during a reaction, so it can be used again.

9. Which of the following acid is used in car battery? [Shift 3]

Sulphuric Acid

As the battery discharges, the sulphuric acid reacts with the lead to form lead sulphate and water. The reaction is reversed when the battery is recharged.

10. Wooden doors are swell up during rain this phenomenon is known as [Shift 3]

Imbibition

The adsorption of water by the solid particles of a substance without forming a solution is called imbibition.It caused jamming of wooden frames during rains.

11. Which of the following are called representatives block? [Shift 3]

s-block & p-block

The s-block elements and p-block elements are also known as representative elements. The noble gases placed in the 18th group of the periodic table are not part of representative elements. The representative elements have completely filled inner orbitals and incomplete outer orbitals or valence shells. This why they tend to get the nearest noble gas configuration either by transfer or sharing of an electron with other atoms.

12. Nuclei having same no. of neutrons called

Isotones

Two nuclei are isotones if they have the same neutron number N, but different proton number Z. For example, boron-12 and carbon-13 nuclei both contain 7 neutrons, and so are isotones

13. Method used to separate methanol and acetone?

(a)Crystallization **(b)Fractional Distillation**

(c)Steam Distillation **(d)Sublimation**

Fractional Distillation

Fractional distillation is a method for separating liquids with different boiling points. For example, liquid ethanol can be separated from a mixture of ethanol and water by fractional distillation. This method works because the liquids in the mixture have different boiling points. When the mixture is heated, one liquid evaporates before the other.

14. Method used to separate very minute solid particle from a liquid

Centrifugation

Sometimes the solid particles in a liquid are very small and can pass through a filter paper. For such particles, the filtration technique cannot be used for separation. Such mixtures are separated by centrifugation. Centrifugation is a mechanical process which involves the use of the centrifugal force to separate particles from a solution according to their size, shape, density, medium viscosity and rotor speed.

15. Down's process is used to extract

(a)Sodium **(b)Lithium**

(c)Potassium **(d)Barium**

Sodium

The Downs cell is used in industry to produce sodium metal. The cell consists of a central carbon anode surrounded by a cylindrical iron cathode. An iron mesh screen is used to prevent chlorine gas, formed at the anode, from coming into contact with sodium metal formed at the cathode.

At anode $2\,Cl^- \rightarrow\ Cl_2(g) + \ 2e^-$

At cathode $2\,Na^+ + \ 2e^+ \rightarrow\ 2\,Na(l)$

Overall reaction $2\,Na^+ + 2\,Cl^- \rightarrow\ 2\,Na(l) + \ Cl_2(g)$

16. Paper chromatography is based on which principle?

Partition

The principle of paper chromatography is partition. In paper chromatography there are two phases one is the stationary phase and the other is the mobile phase. Here, water trapped in the paper acts as the stationary phase and solvent acts as the mobile phase.

17. Ortho and Para hydrogen differ in

(a)Spin of their e- **(b)atomic mass**

(c)Spin of their nucleus **(d)atomic number**

Spin of their nucleus or nuclear spin of two atoms

Molecular dihydrogen are generally of two types : ortho hydrogen and para hydrogen , and this categorization is created is based on important property of their nuclei.