INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad - 500 043

ELECTRICAL AND ELECTRONICS ENGINEERING

DEFINITIONS AND TERMINOLOGY QUESTION BANK

Course Name	:	**ENGINEERING CHEMISTRY**
Course Code	:	**AHSB03**
Program	:	**B.Tech**
Semester	:	**I**
Branch	:	**Electrical and Electronics Engineering**
Section	:	**A & B**
Course Faculty	:	**Dr. V Anitha Rani**

COURSE OBJECTIVES:

The course should enable the students to:	
I	To help students to consider in depth the terminology and nomenclature used in the syllabus.
II	To focus on the meaning of new words / terminology/nomenclature

DEFINITIONS AND TERMINOLOGY QUESTION BANK

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
MODULE-I						
1	Define voltaic cell?	A Voltaic Cell is an electrochemical cell that uses spontaneous redox reactions to generate electricity.	Remember	CO 1	CLO 1	AHSB03.01
2	What is electrolytic cell ?	Electrolytic cells convert electrical energy into chemical potential energy. The process is known as electrolysis. The purpose of this is usually to convert reactants into more useful products.	Remember	CO 1	CLO 1	AHSB03.01
3	What is electrode potential?	The tendency of an electrode to lose or gain electrons, when it is in contact with its own ions.	Remember	CO 1	CLO 1	AHSB03.01
4	What is electrochemical series?	When the elements are arranged in increasing order of their electrode potential, a series is called electrochemical series.	Understand	CO 1	CLO 1	AHSB03.01
5	Why is salt bridge used in the construction of a cell?	They allow the movement of ions from one solution to another without mixing of the two solutions and complete the electrical circuit. To maintain the electrical neutrality of the solutions in the two half cell.	Understand	CO 1	CLO 1	AHSB03.01
6	Define reference electrode?	An electrode whose electrode potential is accurately known or	Remember	CO 1	CLO 1	AHSB03.01

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		whose electrode potential has been arbitrarily fixed. or Reference electrode is an electrode of standard potential with which we can compare the potential of another electrode.				
7	Define Battery?	The term battery is a group of two or more electric cells connected together electrically in series.	Remember	CO 1	CLO 2	AHSB03.02
8	What is an irreversible cell?	The cell in which the cell reaction is not reversible.				
9	what is a reversible cell?	The cells in which the cell reaction is reversed by passing direct current in opposite direction.	Remember	CO 1	CLO 2	AHSB03.02
10	Wire mesh corrodes faster at the joints. Why?	The joints of wire mesh under stressed so these becomes anodic .At these anodic parts, oxidation takes place and the metal is corroded fast, while the cathodic parts remain unaffected.	Understand	CO 1	CLO 3	AHSB03.03
11	Define corrosion?	Any process of deterioration and consequent loss of solid metallic materials through an unwanted chemical or electrochemical attack by its environment, starting at its surface is called corrosion.	Remember	CO 1	CLO 3	AHSB03.03
12	What is galvanic corrosion?	When two dissimilar metals are electrically connected and exposed to an electrolyte, the metal higher in electrochemical series undergoes corrosion.	Remember	CO 1	CLO 3	AHSB03.03
13	Define electro less plating?	Electro less plating is a process of depositing a noble metal on a catalytically active surface of a less noble metal by employing a suitable reducing agent without using electrical energy.	Remember	CO 1	CLO 3	AHSB03.03
14	which types of metal oxide film cause rapid and continues corrosion?	The metal oxide film with Fine grained tightly adhering , impervious oxide film, and highly unstable oxide film.	Understand	CO 1	CLO 3	AHSB03.03
15	which types of metal oxide film prevents corrosion?	The metal oxide film with Fine grained tightly adhering , impervious oxide film, and highly unstable oxide film.	Understand	CO 1	CLO 3	AHSB03.03
MODULE-II						
1	Define hardness of water ?	Hardness of water is that characteristic, which prevents the lathering of soap. This is due to the presence of salts of calcium, magnesium and other heavy metals dissolved in it.	Remember	CO 2	CLO 4	AHSB03.04

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
2	Define the temporary hardness of water	It is due to presence of dissolved carbonates and bicarbonates of calcium and magnesium.	Remember	CO 2	CLO 4	AHSB03.04
3	What are various units of hardness of water	Parts per Million [ppm], milligram per litre [mg/L], Clarke's Degree[^{0}Cl], Degree French[^{0}Fr].	Remember	CO 2	CLO 4	AHSB03.04
4	what is potable water ?	Drinking water also known as "Potable Water". Water which is used for human consumption is called potable water.	Remember	CO 2	CLO 5	AHSB03.05
5	What is softening of water?	The process whereby we remove or reduce the hardness of water ,irrespective of whether it is temporary or permanent is termed as softening of water.	Understand	CO 2	CLO 4	AHSB03.04
6	what is sedimentation?	Water is allowed to stand undisturbed for 2 to 5 hours in big setting tanks.	Understand	CO 2	CLO 5	AHSB12.05
7	Define chlorination?	The process of applying calculated amount of chlorine to water in order to kills the pathogenic bacteria is called "Chlorination".	Remember	CO 2	CLO 5	AHSB03.05
8	What is break point chlorination ?	The amount of chlorine required to kill bacteria and to remove organic matter is called "break point chlorination".	Understand	CO 2	CLO 5	AHSB03.05
9	what is reverse osmosis ?	When a pressure in excess to osmotic pressure is applied on a concentrated site then the movement of solvent molecules from concentrated site to dilute site takes place. This is "Reverse Osmosis".	Remember	CO 2	CLO 5	AHSB03.05
10	Define brackish water?	The water with peculiar (or) salty taste is known as "Brackish Water".	Remember	CO 2	CLO 5	AHSB03.05
11	What is phosphate conditioning ?	In high pressure boilers, scale formation can be avoided by adding sodium phosphate, which reacts with hardness of water forming non-adherent and easily removable soft sludge of calcium and magnesium phosphates which can be removed by blow-down operation.	Remember	CO 2	CLO 5	AHSB03.05
12	Define deionized water?	Water coming out from the exchanges is free from cations as well as anions. Ion free water is known as "deionized" or "Dimineralized water".	Remember	CO 2	CLO 5	AHSB03.05
13	What is internal treatment of hard water	The softening of water carried out inside the boiler is called internal treatment of water. In this process the hardness causing dissolved salts was	Remember	CO 2	CLO 5	AHSB03.05

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
		prohibited.				
14	What is hard water?	Water which does not produce lather with soap solution readily,but forms white curd,is called hard water.	Remember	CO 2	CLO 4	AHSB03.04
15	What is soft water?	Water which lathers easily on shaking with soap solution, is called soft water.	Understand	CO 2	CLO 4	AHSB03.04
MODULE-III						
1	What are atomic orbitals?	Atomic orbital is the region having the highest probability of finding an electron in an atom. The energy levels about the nucleus contain group of these atomic orbitals.	Understand	CO 3	CLO 7	AHSB03.07
2	Write any two salient features for CFT?	i. Ligands are treated as point charges. ii.There is no interaction between metal orbital's and ligand orbital's.	Remember	CO 3	CLO 7	AHSB03.07
3	Define doping?	Doping is the process of adding impurities to increase conductivity nature of semiconductors. Two of the most important materials silicon can be doped with, are boron and phosphorus.	Remember	CO 3	CLO 7	AHSB03.07
4	What are eg, t2g orbital's in crystal field theory?	The dxy, dxz, and dyz orbitals are collectively called the t2g orbitals, whereas the dz2 and dx2-y2 orbitals are called the eg orbitals in crystal field theory.	Remember	CO 3	CLO 7	AHSB03.07
5	Define the term bond order ?	Bond order is a measurement of the number of electrons involved in bonds between two atoms in a molecule. It is used as an indicator of the stability of a chemical bond.	Remember	CO 3	CLO 6	AHSB03.06
6	What are semiconductors?	The gap between valence band and conduction band is small; some electrons jump from valence band to conduction band and thus show some conductivity. Such solids show less conductivity or no conductivity is called semiconductors.	Understand	CO 3	CLO 7	AHSB03.07
7	What are intrinsic semiconductors?	Intrinsic semiconductors are the one with number of holes and electrons are equal, they do not conduct current, all semiconductors used are intrinsic in nature.	Remember	CO 3	CLO 7	AHSB03.07
8	Define the term Bonding moleculer orbital?	The lower energy molecular orbital is called bonding orbital. Since electrons placed in such an orbital increase the stability of the bond.	Understand	CO 3	CLO 6	AHSB03.06

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
9	Define the term anti - bonding molecule orbital?	The antibonding orbital is a type of molecular orbital (MO) that weakens the bond between two atoms and helps to raise the energy of the molecule relative to the separated atoms. Such an orbital has one or more nodes in the bonding region between the nuclei.	Remember	CO 3	CLO 6	AHSB03.06
10	Define the band structure of solids?	The energy band structure of a solid determines whether it is a conductor, an insulator or a semiconductor.	Remember	CO 3	CLO 7	AHSB03.07
11	what is diamagnetic property?	The transition metals which contain paired electrons depict diamagnetic behavior. The magnetic properties decreases with the decrease in the number of unpaired electrons.	Remember	CO 3	CLO 6	AHSB03.06
12	Define about n-type semiconductor?	The n-type semiconductor is an excess negatively charged electrons containing semiconductor and obtained by adding extremely small quantity of a pentavalent element impurity.	Remember	CO 3	CLO 7	AHSB03.07
13	How crystal field splitting takes place in tetrahedral complexes?	Tetrahedral complexes are high spin complexes as the energy gap between two sets of orbitals is roughly half of octahedral complexes.	Remember	CO 3	CLO 7	AHSB03.07
14	Define crystal filled stabilization energy?	The crystal field stabilization energy (CFSE) is the stability that results from placing a transition metal ion in the crystal field generated by a set of ligands.	Remember	CO 3	CLO 7	AHSB03.07
15	How crystal field splitting takes place in octahedral complexes?	In the octahedral complexes, ligand approach along the axes. As a result, the d-orbitals where electron density is oriented along the axes, dx^2-y^2 and dz^2 are repelled much more by the ligands while the orbitals dxy, dyz, dxz having electron density oriented in between the axes are repelled lesser by the ligands.	Remember	CO 3	CLO 7	AHSB03.07
MODULE-IV						
1	What is an electrophile?	The positive or partially positive atom is referred to as an electrophile.	Understand	CO 4	CLO 9	AHSB03.09
2	Define the term isomer?	Molecule has the same number of atoms of each element, but has a different arrangement of the atoms. Isomers have the	Remember	CO 4	CLO 9	AHSB03.09

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
		same molecular formula, but different chemical structures.				
3	Define nucleophilic substitution reactions?	The reaction in which the electron rich nucleophile selectively bonds with or attacks the positive or partially positive charge of an atom or a group of atoms to replace a leaving group are known as nucleophilic substitution reactions.	Remember	CO 4	CLO 10	AHSB03.10
4	State Markovnikov's rule.	An enantiomer is a type of stereoisomers that have the same molecular formula and constitutions around the atom but differ in their spatial arrangement of groups around the atom.	Remember	CO 4	CLO 10	AHSB03.10
5	What are enantiomers?	An enantiomer is a type of stereoisomers that have the same molecular formula and constitutions around the atom but differ in their spatial arrangement of groups around the atom.	Understand	CO 4	CLO 9	AHSB03.09
6	What are diastereomers?	Diastereomers are stereoisomers that are not mirror images of one another and are non-superimposable on one another.	Understand	CO 4	CLO 9	AHSB03.09
7	Define the term addition reactions?	An addition reaction is a reaction where two smaller molecules react to form a bigger molecule with no other products.	Remember	CO 4	CLO 10	AHSB03.10
8	What are substitution reactions?	A substitution reaction occurs when an exchange of elements in the reactants takes place. The initial reactants are transformed or swopped around to give a final product.	Understand	CO 4	CLO 10	AHSB03.10
9	What are nucleophiles?	A nucleophile is a species (an ion or a molecule) which is strongly attracted to a region of positive charge in something else.	Understand	CO 4	CLO 10	AHSB03.10
10	State saytzeff's rule.	Dehydro halogenation reactions, the preferred product is that alkene which has the greater number of alkyl groups attached to the doubly bonded carbon atoms.	Remember	CO 4	CLO 10	AHSB03.10
11	What are elimination reactions?	An elimination reaction occurs when a reactant is broken up into two products. Elimination reactions occur with saturated compounds.	Remember	CO 4	CLO 10	AHSB03.10

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
12	Define the term Stereomers?	Stereo isomers refer to isomers which share an identical bond structure but differ with regards to the geometric position of the functional groups and atoms.	Remember	CO 4	CLO 9	AHSB03.09
13	Define the term optical isomerism?	The type of isomerism in which isomeric compound differ only in the direction in which they rotate the plane polarized light is known as optical isomerism.	Remember	CO 4	CLO 9	AHSB03.09
14	State Anti Markovnikov's rule.	In an addition reaction of a generic electrophile HX to an alkene or alkyne, the hydrogen atom of HX becomes bonded to the carbon atom that had the least number of hydrogen atoms in the starting alkene or alkyne.	Remember	CO 4	CLO 9	AHSB03.09
15	Define the term structural isomerism?	isomers having identical molecular formulas but differing in the order in which the individual atoms are connected.	Remember	CO 4	CLO 9	AHSB03.09
MODULE-V						
1	How many types of fuels are there and what are they?	There are three types of fuels. They are solid fuels, liquid fuels and gaseous fuels.	Understand	CO 5	CLO 12	AHSB03.12
2	What the calorific value of bituminous coal?	The calorific value of bituminous coal is 7500-8000 kcal/kg.The carbon content ranges from 75-80%.	Understand	CO 5	CLO 12	AHSB03.12
3	What are different varieties of coal formed inside the earth?	Peat, lignite, bituminous coal and anthracite coal.	Understand	CO 5	CLO 12	AHSB03.12
4	What is fractional distillation process?	Separation of a liquid mixture into fractions differing in boiling point (and hence chemical composition) by means of distillation, typically using a fractionating column.	Understand	CO 5	CLO13	AHSB03.13
5	What is meant by the term cracking?	The decomposition of higher chain hydrocarbon molecules into simple, low boiling hydrocarbons of lower molecular masses is called as cracking.	Understand	CO 5	CLO 13	AHSB03.13
6	What is meant by the catalytic cracking?	Catalytic cracking is used for cracking heavy oil fractions of petroleum in presence of suitable catalyst. This method	Understand	CO 5	CLO 13	AHSB03.13

S.No	QUESTION	ANSWER	Blooms Level	CO	CLO	CLO Code
		produces gasoline of high quality and in high yield.				
7	What is knocking?	Premature instantaneous ignition of fuel air mixture in an I.C. engine, leading to production of explosive violence is known as knocking.	Remember	CO 5	CLO 13	AHSB03.13
8	What is meant by octane number?	The percentage of isooctane in a mixture of isooctane and n-heptane which matches the gasoline under test.	Remember	CO 5	CLO 13	AHSB03.13
9	What is cetane value of a diesel?	The percentage of hexadecane in a mixture of hexadecane and 2-methyl naphthalene which possess the same ignition characteristics as the diesel fuel.	Remember	CO 5	CLO 13	AHSB03.13
10	What is meant by calorific value?	It is the total quantity of heat liberated when a unit mass or volume of the fuel is burnt completely in presence of sufficient quantity of air or oxygen.	Remember	CO 5	CLO 15	AHSB03.15
11	What are the units of calorific value?	Calorie, kilo calorie, British thermal unit, Centigrade heat unit.	Remember	CO 5	CLO 15	AHSB03.15
12	What is meant by gross calorific value (GCV)?	It is the total quantity of heat liberated when one unit of the fuel has been burnt completely and the products of combustion have been cooled to room temperature is called gross calorific value.	Remember	CO 5	CLO 15	AHSB03.15
13	What is meant by net calorific value(NCV)?	It is net heat evolved when one unit of the fuel has been burnt completely and the products are allowed to escape is called net calorific value.	Remember	CO 5	CLO 15	AHSB03.15
14	Define a chemical fuel?	A combustible substance containing carbon as the main constituent which on proper burning liberates large amount of heat which can be used economically for domestic as well industrial purposes.	Remember	CO 5	CLO12	AHSB03.12
15	what is meant by ignition temperature?	The lowest temperature at which the fuel must be preheated so that it starts burning smoothly.	Understand	CO 5	CLO 12	AHSB03.12

Signature of the Faculty **HOD, EEE**