

1 (k)  $120 \text{ g of MgSO}_4 \equiv 100 \text{ g of CaCO}_3$

$$0.204 \text{ g/L of MgSO}_4 = \frac{100 \times 0.204}{120} = 0.17 \text{ g/L of CaCO}_3$$

$$\text{Hardness in mg/L} = \frac{0.17 \times 10^6}{1000} = 170 \text{ mg/L}$$

l. Mercury vapours.

m) Reduction may be defined as the process in which an atom or an ion gains one or more electrons.

n) Solutions of inorganic acids, bases, salts.

o) The substances which do not allow electricity to pass through them.

p) Atoms of C = 6, Electronic Configuration =  $1s^2 2s^2 2p_x^2 2p_y^1 2p_z^1$  (ground state)

E.C. (excited state)  $1s^2 2s^1 2p_x^1 2p_y^1 2p_z^1$

Carbon atom in the excited state has four half filled orbitals, hence ~~its valency~~ carbon shows a valency of four.

(OR)

Carbon atom shows a covalency of four i.e. it forms four covalent bonds with other atoms.

q) Hydrocarbons which contain at least one carbon-carbon double bond ( $>C=C<$ ) in their molecules.

r)  $-COOH$ . (R-COOH)

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(2)

n) The self linking property of an element as a result of which it forms bonds with other atoms of the same element is called catenation.

o) -OH (R-OH)

p) Aromatic compound - Benzene 

Aliphatic Compound - Ethane  $\text{CH}_3-\text{CH}_3$

q) Glass is an amorphous, hard, transparent (or translucent) supercooled, complex mixture of various silicates.

r) The number of repeating units (monomers) in the chain of polymer is called degree of polymerisation.

## Applied Chemistry

①

1 (a) The elements which are soft, less dense, brittle, poor conductors of heat and electricity, electronegative in character and possess low m.p.tn and b. pts are called non-metals.

(b) Haematite ( $\text{Fe}_2\text{O}_3$ )

c) A fusible mass formed by combination of matrix and flux is called slag.

(c) Methane

d) Softening of steel

f) It is the amount of heat required to raise the temperature of one gram of water through  $1^\circ\text{C}$  (more precisely from  $15^\circ\text{C}$  to  $16^\circ\text{C}$ )

g) The residue left after burning of coal (fuel)

h) Compressed Natural Gas.

i) Wet corrosion or Electrochemical Corrosion.

j) The process of coating base metal like iron or copper with tin.

k) Quicker

l) Poise

m) When a lubricating oil is cooled slowly, the temperature at which the oil ceases to flow or pour is called its pour point.



## Applied Physics - II

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### Section A

- Ans 1(a) Harmonic Motion - A motion is said to be simple harmonic if the acceleration is directly proportional to displacement. The harmonic motion is expressed in terms of harmonic functions like  $\sin\theta$ ,  $\cos\theta$  etc. Ex - pendulum, spring etc.
- b) Acoustics of building - The branch of acoustics (sound) which deals with construction of public halls, theatres, auditoriums etc. to have best sound effects.
- c) Reverberation time - The time for which sound persists in a hall, after the source has stopped emitting sound is called reverberation time.
- d) Reflection of light - It is the process of reflecting back of light from a polished surface. The angle of incidence is equal to angle of reflection. The incident ray, reflected ray and normal, all lie in the same plane.
- e) Power of a lens - It is defined as reciprocal of focal length in metres. It is measured in dioptres.
- $$P = \frac{1}{f(m)} = \text{dioptres.}$$
- f) Capacitance - It is the ability of a body to store charge. It is measured as ratio of charge stored and the potential difference between the plates of capacitor.
- $$C = \frac{q}{V} \quad (\text{measured in Farad.})$$

Section-A

1(a) Gases

- (b) Valency may be defined as combined capacity of an element with another element.
- (c) Atoms of different elements having same atomic mass and different atomic number.
- (d) Positive,  $1.6 \times 10^{-19}$  C
- (e) Mass no is equal to the sum of no. of protons and no. of neutrons.
- (f) James Chadwick
- (g) A solution which resist any change in its pH value even when small amounts of the acid or base are added to it.
- h. A homogenous mixture of two or more components or substances.
- i) The water which does not form lather with soap solution.
- j) Permanent hardness of water is due to the presence of chlorides and sulphates of calcium and magnesium.

