Some Basic Concepts of Chemistry

Set – 1

Table 1.1 Base Physical Quantities and their Units

Base Physical Quantity	Symbol for Quantity	Name of SI Unit	Symbol for SI Unit
Length	l	metre	m
Mass	m	kilogram	kg
Time	t	second	s
Electric current	I	ampere	A
Thermodynamic temperature	T	kelvin	K
Amount of substance	n	mole	mol
Luminous intensity	I_v	candela	cd

Q1. Which of the following pairs are the correct symbol and SI units of Luminous Intensity ?

a. T , Kelvin

b. Iv ,Candela

c. n ,Candela

d. n , mole

Ans. (b.)

Q2. Which of the following is the correct symbol for SI units of Temperature?

a. T

b. A

c. S

d. K

Ans. (d)

Q3. Which of the following is the correct symbol for SI units of electric current?

a. I

b. C

c. A

d. E

Ans. (c)

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Table 1.2 Definitions of SI Base Units

Unit of length	**metre**	The *metre*, symbol m is the SI unit of length. It is defined by taking the fixed numerical value of the speed of light in vacuum c to be 299792458 when expressed in the unit ms^{-1}, where the second is defined in terms of the caesium frequency ΔV_{Cs}.
Unit of mass	**kilogram**	The *kilogram*, symbol kg. is the SI unit of mass. It is defined by taking the fixed numerical value of the Planck constant h to be $6.62607015\times 10^{-34}$ when expressed in the unit Js, which is equal to kgm^2s^{-1}, where the metre and the second are defined in terms of c and ΔV_{Cs}.
Unit of time	**second**	The second symbol s, is the SI unit of time. It is defined by taking the fixed numerical value of the caesium frequency ΔV_{Cs}, the unperturbed ground-state hyperfine transition frequency of the caesium-133 atom, to be 9192631770 when expressed in the unit Hz, which is equal to s^{-1}.
Unit of electric current	**ampere**	The *ampere*, symbol A, is the SI unit of electric current. It is defined by taking the fixed numerical value of the elementary charge e to be $1.602176634\times 10^{-19}$ when expressed in the unit C, which is equal to As, where the second is defined in terms of ΔV_{Cs}.
Unit of thermodynamic temperature	**kelvin**	The Kelvin, symbol k, is the SI unit of thermodynamic temperature. It is defined by taking the fixed numerical value of the Boltzmann constant k to be 1.380649×10^{-23} when expressed in the unit JK^{-1}, which is equal to $kgm^2s^{-2}k^{-1}$ where the kilogram, metre and second are defined in terms of h, c and ΔV_{Cs}.
Unit of amount of substance	**mole**	The mole, symbol mol, is the SI unit of amount of substance. One mole contains exactly 6.02214076×10^{23} elementary entities. This number is the fixed numerical value of the Avogadro constant, N_A when expressed in the unit mol^{-1} and is called the Avogadro number. The amount of substance, symbol n, of a system is a measure of the number of specified elementary entities. An elementary entity may be an atom, a molecule, an ion, an electron, any other particle or specified group of particles.
Unit of luminous Intensity	**Candela**	The candela, symbol cd is the SI unit of luminous intensity in a given direction. It is defined by taking the fixed numerical value of the luminous efficacy of monochromatic radiation of frequency 540×10^{12} Hz, K_{cd}, to be 683 when expressed in the unit $lm\cdot W^{-1}$, which is equal to $cd\cdot sr\cdot W^{-1}$, or cd sr kg^{-1} $m^{-2}s^3$, where the kilogram, metre and second are defined in terms of h, c and ΔV_{Cs}.

Q1. Unit of plank constant is

a. J

b. J m

c. J s

d. J Kg

Ans. (c)

Q2. Symbol for SI unit of thermodynamic Temperature is

a. T
b. K
c. both A and B
d. none

Ans. (b)

Q3. SI unit of Avogadro number is

a. mole
b. $mole-1$
c. kg
d. unitless

Ans. (b)

Q4. Unit of amount of substance is

a. Gram
b. $mole-1$
c. mole
d. Kg

Ans. (c)

Q5. Unit of frequency is

a. Hz
b. s^{-1}
c. Both
d. None of the above

Ans. (c)

Set – 3

Multiple	Prefix	Symbol
10^{-24}	yocto	y
10^{-21}	zepto	z
10^{-18}	atto	a
10^{-15}	femto	f
10^{-12}	pico	p
10^{-9}	nano	n
10^{-6}	micro	μ
10^{-3}	milli	m
10^{-2}	centi	c
10^{-1}	deci	d
10	deca	da
10^{2}	hecto	h
10^{3}	kilo	k
10^{6}	mega	M
10^{9}	giga	G
10^{12}	tera	T
10^{15}	peta	P
10^{18}	exa	E
10^{21}	zeta	Z
10^{24}	yotta	Y

Q1. Symbol for deca is

a. d
b. da
c. de
d. None of above

Ans. (a)

Q2. What is the prefix for symbol h ?

a. Hexa
b. Hecto
c. Hex
d. None

Ans. (b)

Q3. What is the prefix for multiple 10

a. deca
b. deci
c. giga
d. tera

Ans. (a)

Q4. What is the prefix for symbol 'Z'

a. Zepto
b. Zeta
c. Zeno
d. None

Ans. (b)

Q5. What is the multiple for prefix Femto ?

a. 10^{-15}
b. 10^{-18}
c. 10^{-12}
d. 10^{-21}

Ans. (a)

Q6. Select the correct pair for multiple and symbol of zeta .

a. 10^{21}, z
b. 10^{-21}, Z
c. 10^{21}, Z
d. 10^{-21}, z

Ans. (c)

Set - 4

Isotope	Relative Abundance (%)	Atomic Mass (amu)
^{12}C	98.892	12
^{13}C	1.108	13.00335
^{14}C	2×10^{-10}	14.00317

Q1. Relative abundance of carbon 12 isotope is

a. 97.892
b. 98.892
c. 98.792
d. 97.792

Ans. (b)

Q2. Relative abundance of carbon 13 isotope is

a. 1.108
b. 1.106
c. 1.107
d. 1.109

Ans. (a)

Q3. Atomic mass is represented in

a. gram
b. mg
c. amu
d. kg

Ans. (c)

Q4. Relative abundance of carbon 14 isotope is

a. 1 X 10 ^(-10)
b. 2 X 10 ^(-10)
c. 3 X 10 ^(-10)
d. 4 X 10 ^(-10)

Ans. (b)

Q5. How many isotope of carbon exist in nature?

a. 1
b. 2
c. 3
d. 4

Ans. (c)

Q6. Which of the following isotopes of carbon has highest relative abundance ?

a. Carbon 12
b. Carbon 13
c. Carbon 14
d. All of the above

Ans. (a)