APPENDIX NO. 1

International System SI Base Units used for measuring physical magnitudes and phenomena are the following:

Table 1: SI Base Units

Base Quantity		***Base Unit***	
Name	***Symbol***	***Name***	***Symbol***
Length	*l*	meter	M
Mass	*m*	kilogram	Kg
Time	*t*	seconds	S
Electric current	*I*	Ampere	A
Thermodynamic temperature	*T*	Kelvin	K
Amount of substance	*n*	Mole	Mol
Luminous intensity	I_v	Candela	Cd

Table 2: SI derived units, whose names and symbols include SI derived units with specific names and symbols				
Derived quantity	***Derived Unit SI***			
	Name	***Symbol***	***Expressed in other SI Units***	***Expressed by SI Base Units***
Plane angle	radian [a]	rad	-	$m \cdot m^{-1} = 1$ [b]
Solid angle	steradian [a]	sr [c]	-	$m^2 \cdot m^{-2} = 1$ [b]
Frequency	hertz	Hz	-	s^{-1}
Force	newton	N	-	$m \cdot kg \cdot s^{-2}$
Pressure, stress	pascal	Pa	N/m^2	$m^{-1} \cdot kg \cdot s^{-2}$
Energy, work, quantity of Heat	joule	J	$N \cdot m$	$m^2 \cdot kg \cdot s^{-2}$
Power, radiant flux	watt	W	J/s	$m^2 \cdot kg \cdot s^{-3}$
Electric charge, quantity of electricity	coulomb	C	-	$s \cdot A$
Electric potential difference, electromotive force	volt	V	W/A	$m^2 \cdot kg \cdot s^{-3} \cdot A^{-1}$
Capacitance	farad	F	C/V	$m^{-2} \cdot kg^{-1} \cdot s^4 \cdot A^2$
Electric resistance	ohm	Ω	V/A	$m^2 \cdot kg \cdot s^{-3} \cdot A^{-2}$
Electric conductance	siemens	S	A/V	$m^{-2} \cdot kg^{-1} \cdot s^3 \cdot A^2$
Magnetic flux	weber	Wb	$V \cdot s$	$m^2 \cdot kg \cdot s^{-2} \cdot A^{-1}$
Magnetic flux density	tesla	T	Wb/m^2	$kg \cdot s^{-2} \cdot A^{-1}$
Inductance	henry	H	Wb/A	$m^2 \cdot kg \cdot s^{-2} \cdot A^{-2}$
Celsius temperature	degree Celsius	°C	-	K
Luminous flux	lumen	lm	$Cd \cdot sr$ [c]	$m^2 \cdot m^{-2} \cdot cd = cd$
Luminance	lux	lx	Lm/m^2	$m^2 \cdot m^{-4} \cdot cd = m^{-2} \cdot cd$
Activity (of a radionuclide)	becquerel	Bq	-	s^{-1}
Absorbed dose, specific energy (imparted), kerma	gray	Gy	J/kg	$m^2 \cdot s^{-2}$
Dose equivalent [d]	sievert	Sv	J/kg	$m^2 \cdot s^{-2}$
Catalytic activity	katal	kat		$s^{-1} \cdot mol$

Table 3: SI derived units, whose names and symbols include SI derived units with specific names and symbols		
Derived Quantities	***Derived Unit SI***	
	Name	***Symbol***
Dynamic viscosity	pascal second	Pa·s
Moment of force	newton meter	N·m
Surface tension	newton per meter	N/m
Angular velocity	radian per second	rad/s
Angular acceleration	radian per second squared	rad/s^2
Heat flux density, irradiance	watt per square meter	W/m^2
Heat capacity, entropy	joule per Kelvin	J/K
Specific heat capacity, specific entropy	joule per kilogram Kelvin	J/(kg·K)
Specific energy	joule per kilogram	J/kg
Thermal conductivity	watt per meter Kelvin	W/(m·K)
Energy density	joule per cubic meter	J/m^3
Electric field strength	volt per meter	V/m
Electric charge density	coulomb per cubic meter	C/m^3
Electric flux density	coulomb per square meter	C/m^2
Permittivity	farad per meter	F/m
Permeability	henry per meter	H/m
Molar energy	joule per mole	J/mol
Molar entropy, molar heat capacity	joule per mole Kelvin	J/(mol·K)
Exposure (x and γ rays)	coulomb per kilogram	C/kg
Absorbed dose rate	gray per second	Gy/s
Radiant intensity	watt per steradian	W/sr
Radiance	watt per square meter steradian	$W/(m^2 \cdot sr)$
Catalytic (activity) concentration	katal per cubic meter	kat/m^3

Table 4: Units out of SI generally accepted and used

Quantity		***Unit***		
Name	***Symbol***	***Name***	***Symbol***	***Value in SI Units***
Time	*t*	Minute hour Day	min h d	1 min = 60 s 1 h = 60 min 1 d = 24 h
Plane Angle		Degree Minutes Seconds	° ’ ”	/180)1 ° = (rad 1’ = (1/60)’ 1” = (1/60)”
Volume	*V*	Liter	L	1 L = 1 dm^3
Mass	*m*	Metric tone	t	1 t = 10^3 kg
log		Neper	Np	1 Np = 1
ln		Bel	B	1 B = (1/2)ln 10 Np

Clarification:

It is allowed the use of some units that entered deeper use such as:

- Traditional math units for measuring the angles: arch scale, arch minute and arch.
- Traditional units for measuring of civil time (minute, hour, day and year).
- Two measuring unties that are often used in the daily life: liter for volume and ton for large mass.

Two logarithmic units: neper and bel.

Table 5: Units out of SI permitted for use values of which are determined experimentally				
Quantity		**Unit**		
Name	***Symbol***	***Name***	***Symbol***	***Value in SI Units***
Energy	E	Electron volt	eV	1 eV = 1,602 18*10^{-19} J (approximately)
Mass	m	Unified atomic mass unit	u	1 u = 1,660 54*10^{-27} kg (approximately)
Length	*l*	astronomic unit	ua	1 ua = 1,495 98*10^{11} m (approximately)

Clarification:

It is allowed the use of some scientific units out of SI which present important constants in science such as: astronomic unit for length, atomic unit for mass or Dalton for quantity and electron and Volt for energy which are given in table 5.

Table 6: Units out of SI accepted for use in specific areas

Quantity	*Unit*	*Symbol*	*Value in SI Units*
Length	Nautical mile		1 Nautical mile = 1852 m
speed	knot		1 Nautical mile per hour = (1852/3600) m/s
Linear densitety	texs		1 texs=10^{-6}kg/m=1mg/m
Pressure of liquids of human body	millimeter Colon with mercury	mmHg	1 mmHg=133322Pa
surface	are	a	1 a = 1 dam^2 = 10^2 m^2
	hectare	ha	1 ha = 1 hm^2 = 10^4 m^2
Pressure	bar	bar	1 bar = 0.1 MPa = 100 kPa = 1000 hPa = 10^5 Pa
Length	Ångström	Å	1 Å = 0.1 nm = 10^{-10} m
Section	barn	b	1 b = 100 fm^2 = 10^{-28} m^2

Clarification:

It is allowed the use of some metric and non-metric units which are in traditional use in different scientific fields. The use of these units should be understood in the way that in the case of any use the correlation of them with respective international units- SI should be given. These are:

- Nautical mile as a unit of speed and **knot** as unit of speed which is traditionally used in marine and meteorology.
- Acre and hectare units often used for surface (in Albania it s also used a lot the very old unit with Turkish origin – dulum that is 10 acres).
- Bar as a unit of pressure with all its manifolds and submultiples build according to the respective prefixes such as milibar in meteorology and kilobar in technique.
- angstrom (**ångström**) as a unit of length in physics and barn as a unit of efficient section in nuclear physics.

Table 7: Derived units of the CGS system with special names

Quantity	Name	Symbol	*Value in SI Units*
Work energy	erg	erg	1 erg = 10^{-7} J
force	din (dyn)	dyn	1 dyn = 10^{-5} N
Viscose	puaz (poise)	P	1 P = 1 dyn s/cm^2 = 0.1 Pa s
	stoks (stokes)	St	1 St = 1 cm^2/s = 10^{-4} m^2/s
Magnetic induction	gaus	G	1 G ≙ 10^{-4} T
The intensity of the magnetic filed	oersted	Oe	1 Oe ≙ (1000/4π) A/m
Magnetic flux	maksuell	Mx	1 Mx ≙ 10^{-8} Wb
Brightness	stilb	sb	1 sb = 1 cd/cm^2 = 10^4 cd/m^2
Illumination	fot (phot)	ph	1 ph = 10^4 lx
acceleration	gal	Gal	1 Gal = 1 cm/s^2 = 10^{-2} m/s^2

Clarification:

In table 7 are given units that can be found in literature and it is preferable that readers avoid them. With the help of this table they are transformed into the SI units and after the values are allowed for use.

Table 8: Units out of SI forbidden for use

Quantity	*Name*	*Symbol*	*Value in SI Units*
The activity of radionuclide	Curie	Ci	1 Ci = $3.7*10^{10}$ Bq
Exposure of X or gama rays	Roentgen	R	1 R = $2.58*10^{-4}$ C/kg
Absorption dosage of ionization	Rad	rad	1 rad = 1 cGy = 10^{-2} Gy
Equivalent dosage	Rem	rem	1 rem = 1 cSv = 10^{-2} Sv
length	unit X		1 unit X =1,002*10^{-4} nm
Submultiples of unit Tesla	gama	γ	1 γ= 1 nT = 10^{-9} T
	jansky	Jy	1 Jy = 10^{-26} W · m^{-2} · Hz^{-1}
length	fermi		1 fermi = 1 fm = 10^{-15} m
mass	Metric carat		1 karat metrik = 200 mg = $2*10^{-4}$ kg
pressure	torr	Torr	1 Torr = (101 325/760) Pa
	Normal atmosphere	atm	1 atm = 101 325 Pa
heat	calorie	cal	1 cal = 4,1868 J
Length	mikron	μ	1 μ = 1 μm = 10^{-6} m

Clarification:

In table 8 are given the units out of SI and it is preferable that readers avoid them. If they are found in literature, they should first of all be transformed in SI units according to this table and after the achieved values are usable in SI.

Table 9 : Prefixes SI

Factor	Name	Symbol
10^{24}	Jota	Y
10^{21}	Zeta	Z
10^{18}	Ekza	E
10^{15}	Peta	P
10^{12}	Tera	T
10^{9}	Giga	G
10^{6}	mega	M
10^{3}	kilo	K
10^{2}	hekto	H
10^{1}	deka	da

Factor	Name	Symbol
10^{-1}	deci	d
10^{-2}	centi	c
10^{-3}	mili	m
10^{-6}	mikro	μ
10^{-9}	nano	n
10^{-12}	piko	p
10^{-15}	femto	f
10^{-18}	ato	a
10^{-21}	zepto	z
10^{-24}	jokto	y

Clarification:

SI prefixes are used to create decimal units. Decimal units are created from:

- all basic units of SI, except the unit of kilogram-kg (tab.2).
- all derived units SI especially named, except unit of degree celzius-^{0}C (tab. 3).
- These units out of SI allowed to be used in special occasions and named especially: liter (L), tex (tex), bar (bar), elektronvolt (eV), and varn (var).

Table 10 : Prefixes for multiple binary

Name	Symbol	Factor
kibi	Ki	$2^{10} = 1024$
mebi	Mi	$2^{20} = 1\ 048\ 576$
gibi	Gi	$2^{30} = 1\ 073\ 741\ 824$
tebi	Ti	$2^{40} = 1\ 099\ 511\ 627\ 776$
pebi	Pi	$2^{50} = 1\ 125\ 899\ 906\ 842\ 624$
eksbi	Ei	$2^{60} = 1\ 152\ 921\ 504\ 606\ 846\ 975$
zebi	Zi	$2^{70} = 1\ 180\ 591\ 620\ 717\ 411\ 303\ 424$
jobi	Yi	$2^{80} = 1\ 208\ 925\ 819\ 614\ 629\ 174\ 706\ 176$

Clarification:

In December 1998 **IEC** (**International Electrotechnical Commission**), has approved standard names and symbols of prefixes for multiple binary. These prefixes are given in table 7. The names are formed from two first letters of the international prefix for multiples (***ki, me, gi, ti, pi, ex, ze, yo***), from letters bi that means ***binary*** and that can be applied in unit bit or byte. The symbols of binary multiples are formed from the symbol of international multiples– SI (K, M, G, T, P, E, Z, Y) and the letter ***i*** (Ki, Mi, Gi, Ti, Pi, Ei, Zi, Yi). In this case the multiple kilo got the symbol K and it can also be k.

Table 11: Comparisons with prefixes SI

a kibibit	1 Kibit = 2^{10} bit = **1 024 bit**
a kilobit	1 kbit = 10^3 bit = **1 000 bit**
a mebibajt	1 MiB = 2^{20} B = **1 048 576 B**
a megabajt	1 MB = 10^6 B = **1 000 000 B**
a gibibajt	1 GiB = 2^{30} B = **1 073 741 824 B**
a gigabajt	1 GB = 10^9 B = **1 000 000 000 B**

Clarification:

In table 11 are some examples of comparisons of binary units with international units.