

QUESTIONS

power	prefix	abbreviation	power	prefix	abbreviation
10^{-2}	centi	c	10^3	Kilo	k
10^{-3}	mili	m	10^6	Mega	M
10^{-6}	mikro	μ	10^9	Giga	G
10^{-9}	nano	n	10^{12}	Tera	T

Quantity	SI unit	cgs Unit	Dimension
Length	m	cm	L
Mass	kg	g	M
Time	s	s	T

1-) Convert the measuring units as indicated

a) $V = 72 \text{ m/s} = \dots\dots\dots \text{ km/hour}$
b) $0,005 \text{ km/g} = \dots\dots\dots \text{ m/g} = \dots\dots\dots \text{ cm/kg}$
c) $T = 20\mu\text{s} \text{ (mikrosecond)} \Rightarrow f = \dots\dots\dots \text{ Hz}$ ($1\text{Hz} = 1/\text{s}$), $f = 1/T$
d) $\omega = 72 \text{ degree/s} = \dots\dots\dots \text{ rad/s}$
e) $V = 0,13 \text{ k g/cm}^3 = \dots\dots\dots \text{ g/m}^3$

f) Write the units of "s" for each option. [A] = kg; [B]= m; [C]=m/s

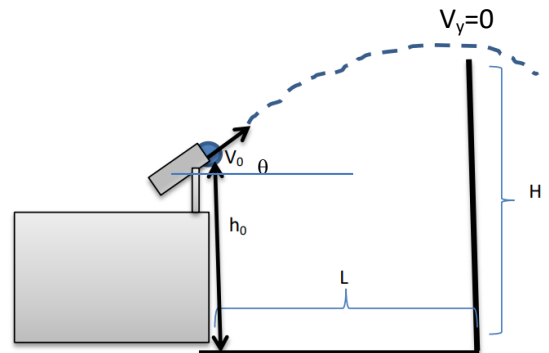
$S = 2A/3B \Rightarrow [S]=?$
$S = AB/C^2 \Rightarrow [S]=?$
$S = C/AB \Rightarrow [S]=?$

2) a) A projectile is launched at an angle to the horizontal $\theta = 45^\circ$; and rises upwards. When $y = H = 1,392\text{m}$ it's vertical velocity $V_{y\text{final}} = 0$. Find the initial velocity V_0 (m/s) ?
 $L = 0,784\text{m}$, $h_0 = 1\text{m}$

$(\sin 45^\circ = \cos 45^\circ = 0,7; g = 10\text{m/s}^2); x(t) = x_0 + V_{0x}t$;

$V_{0x} = V_0 \cos \theta; V_{0y} = V_0 \sin \theta; ; V_{yf} = V_{y0} - gt$

$y(t) = y_0 + V_{0y}t - (1/2)gt^2;$

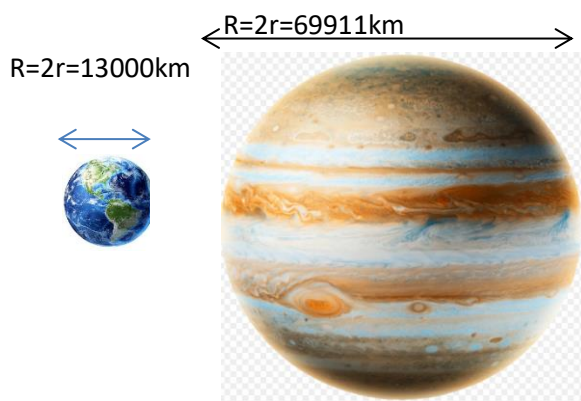


2b) Choose any experiment and fill in the table given below.

Name of the experiment:	
Purpose of the experiment:	
Which measurement devices were used?	
Did you draw graphics? What was the graph? Or what was your calculated quantity? What did you find?	

3) a) Suppose that the Jupiter and the Earth as perfect spheres. How many Earths can be fill in the Jupiter's volume?

($V_{\text{sphere}} = \frac{4}{3}\pi r^3$)



b) According to $M_{\text{jupiter}} = 1.898 \times 10^{27}$ kg and $M_{\text{earth}} = 5.972 \times 10^{24}$ kg; how many times the mass of jupiter is greater than the mass of the earth?

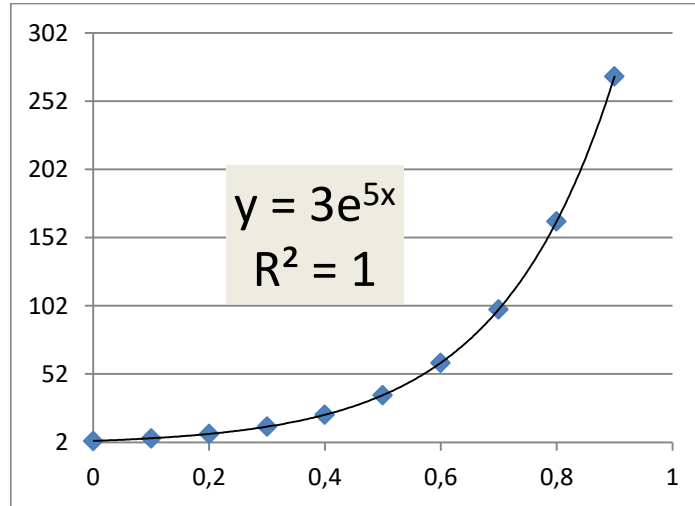
c) Since Jupiter has a gravitational acceleration of $g = 24,79 \text{ m/s}^2$. if a person 70 kg in the Earth, what will be his weight on the Jupiter (in Newton)?

d) If a simple pendulum's period is 10seconds on the Earth, What will be the pendulum's period on Jupiter? $T = 2\pi \sqrt{\frac{L}{g}}$

4-) The following measurements were taken in an experiment. F (N) is force which is acting on an object, and a (m/s²) is the acceleration of this object. Answer the questions about given graphics.

- Which quantity should be on x-axis? Write on the graphics.
- Which quantity should be on y-axis? Write on the graphics.
- $A = 3 \Rightarrow$ what is the SI unit and dimension of A?
- $B = 5 \Rightarrow$ what is the SI unit and dimension of B?
- If $a=10\text{m/s}^2$ what will be the value of force?

a(m/s ²)	F(N)
0	3
0,1	4,946164
0,2	8,154845
0,3	13,44507
0,4	22,16717
0,5	36,54748
0,6	60,25661
0,7	99,34636
0,8	163,7945
0,9	270,0514

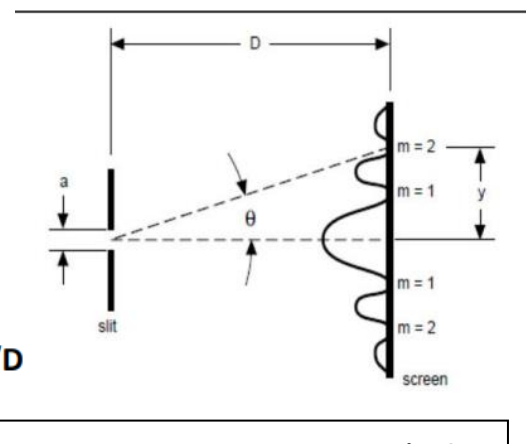


5) a) Calculate the frequency, (f); period (T), or wavelength (λ) of EMW (electromagnetic waves) $c=3 \cdot 10^8 \text{ m/s}$, $c = \lambda f = \lambda/T$

Frequency (f)	Wavelength (λ)	Period (T)
10kHz	?	?
?	?	400 milisecond
?	50mm	?

- b) The following measures were taken in an experiment that created interference patterns. Find the wavelength of the light and tell us what color is the light according to the table?

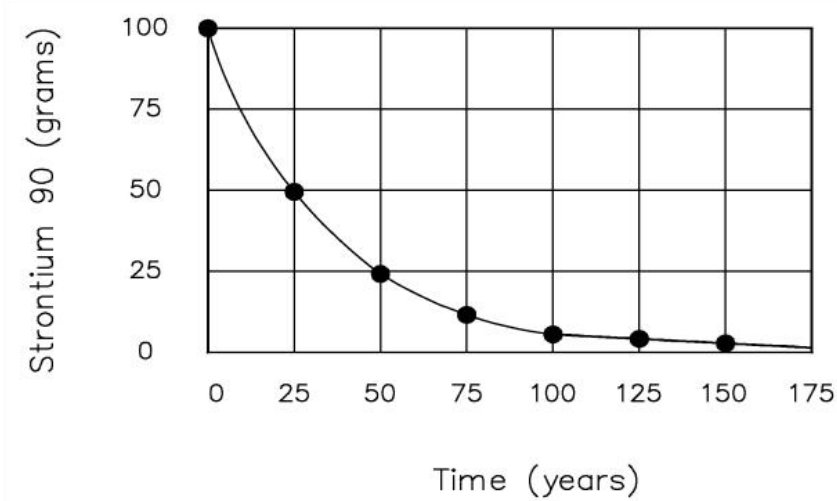
COLOR	WAVELENGTH nm
Violet	380-440
Blue	440-500
Green	500-560
Yellow	560-590
Orange	590-640
Red	640-750



$a=0,25\text{mm}; D=3\text{m}; y=1,44\text{cm}; m=2 ; \Rightarrow \lambda=?$

4-) The following graph shows us **Strontium_90** element's radioactivity.

- a) What is the half life of this element according to the given graph?
- b) For this element, what is the time to reach 25 grams?
- c) What is the radioactive decay constant? $\lambda = ?$ ($N=N_0e^{-\lambda t}$)
- d) What is the unit and dimension of λ for this graph?

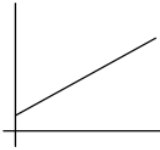
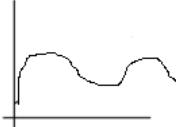


Which of the three radioactive emissions (alpha, beta and gamma) (α , β , γ) best fit the following statements? Write the correct symbol or symbols on the lines.

- e) These emissions are charged. _____
- f) This emission is the most massive (heaviest). _____
- g) This emission is the most charged. _____
- h) This emission is most dangerous outside of the body. _____
- i) This emission is stopped by thin paper or a few centimeters of air. _____
- j) This emission can travel through paper, but is stopped by aluminum. _____
- k) This emission can travel through fairly thick lead. _____

Q2) Fill the blanks with given words, and answer the test questions. (Verilen kelimeler ile boşlukları doldurunuz ve test sorularını cevaplayınız).

a) velocity	d..) Radioactivity	g..) Angular momentum
b) Hooke's law	e..) SI unit system	h..) projectile
c) Electromagnetic-waves	f..) non-ionizing radiation	i..) frequency
1) i.e. The _____ of an object is the rate of change of its position with respect to a frame of reference, and is a function of time.		
2) _____ is the number of occurrences of a repeating event per unit time.		1- a) velocity
3) _____ includes radiowaves, microwaves, infrared, (visible) light, ultraviolet, X-rays, and gamma rays.		2-
4) _____ which are electromagnetic waves incapable of producing ions while passing through matter, due to their lower energy		3-
5) _____ It is a vector quantity that represents the product of a body's rotational inertia and rotational velocity about a particular axis.		4-
6) _____ says that if we double the displacement from equilibrium, the force acting to return the object to the equilibrium position also doubles.		5-
7) _____ is a spontaneous and random phenomenon whereby unstable nuclei of certain elements radiate gamma rays, beta particles, and alpha particles in order to become stable.		6-
8) A _____ is an object upon which the only force acting is gravity.		7-
9) _____ is the modern form of the metric system, and is the most widely used system of measurement.		8-
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10) Motion that is repeated at regular intervals is termed as a) Periodic motion b) Vibration c) Oscillation d) Linear motion	
11) Light is slowest in a) Air b) Liquid c) Solid d) Vacuum	
12) The shortest time interval in which a wave motion completely repeats itself (i.e., makes one complete vibration or oscillation) is called the a) amplitude b). period d). speed e). Wavelength d) frequency	
13) What does the graph on the right show? a) a decreasing slope (azalan eğim) b) a constant slope (sabit eğim) c) an increasing slope (artan eğim) d) variable slope (değişken eğim)	
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15) Which of the following radiation is not an electromagnetic wave? a) Infrared b) alpha c) microwave d) gamma	
16) A radioactive source has a half-life of 60 minutes. How much remains after 2 hours? a) 25% b) 50% c) 75% d)12.5%	
17) Sound is produced due to a) friction b) diffraction c) vibration d)reflection	
18) Waves which can propagate through vacuum are? a) Elastic waves b) Sound waves c) electro-magnetic waves d) None of these	