University/College/School Name
Institute Name
Departament Name
Prof. Name

Exam/Test 1 – Physics 101 – 01 Jan 2023

Any important message to students, if necessary

Example

$1^\circ \cdots 7^\circ$

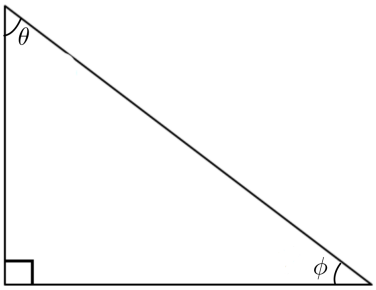
For the ID number 2013579, mark as follows:

STUDENT ID										
–	0	1	2	3	4	5	6	7	8	9
1°			■							
2°	■									
3°		■								
4°				■						
5°						■				
6°								■		
7°										■

1. A particle of mass 7.9 kg is subject to an external force of 17.4 N. Calculate the acceleration in m/s^2 in a one-dimensional movement.
(a)2.2 (b)7.4
(c)11.8 (d)4.2
(e)8.5

2. Mark the true alternative.
(a) If $\vec{A}$ and $\vec{B}$ are vectors, then $\vec{A}\times\vec{B}$ is a vector perpendicular to both $\vec{A}$ and $\vec{B}$.
(b) A vector multiplied by a scalar results is a vector with different direction.
(c) The result of summing a vector and a scalar is a scalar.
(d) Division between vectors is defined in Mathematics.
(e) Vectors can not be multiplied by scalars.

3. Consider the rectangle triangle of the figure below and knowing $\theta = 27^\circ$, determine ϕ **in rad**.



(a)1.237 (b)1.328 (c)1.176 (d)1.100 (e)1.063

Fórmulas e Constantes

$I = \dfrac{P_s}{4\pi r^2}$; $E = hf$; $p = \dfrac{hf}{c} = \dfrac{h}{\lambda}$

$hf = K_{\max} + \Phi$; $\Delta\lambda = \dfrac{h}{mc}(1-\cos\phi)$

$\dfrac{d^2\psi}{dx^2} + \dfrac{8\pi^2 m}{h^2}[E - U(x)]\psi = 0$

$T \approx e^{-2bL}$, onde $b = \sqrt{\dfrac{8\pi^2 m(U_b - E)}{h^2}}$

$E_n = \left(\dfrac{h^2}{8mL^2}\right) n^2$, para $n = 1, 2, 3\ldots$

$\psi_n(x) = A\sin\left(\dfrac{n\pi}{L}x\right)$, para $n = 1, 2, 3\ldots$

$\Delta x \Delta p = h/2\pi$

$\epsilon_0 = 8,854\times10^{12}$ F/m; $\mu_0 = 1,257\times10^{-6}$ H/m

$c = 3,0\times10^8$ m/s; $h = 6,63\times10^{-34}$ J/s $= 4,14\times10^{-15}$ eV.s

$hc = 1240$ eV.nm

Eletron : $mc^2 = 511$ keV

RESERVED										
un	–		–	–	–	–	–	–	–	–
ANSWERS										
–	1	2	3	–	–	–	–	–	–	–
a				–	–	–	–	–	–	–
b				–	–	–	–	–	–	–
c				–	–	–	–	–	–	–
d				–	–	–	–	–	–	–
e				–	–	–	–	–	–	–
STUDENT ID										
–	0	1	2	3	4	5	6	7	8	9
1°										
2°										
3°										
4°										
5°										
6°										
7°										

NAME:

ID NUMBER: