Menoufiya University Faculty of Engineering Shebin El-Koom Subject Code: Physics 2 First Semester Exam. Academic Year: 2013/2014	Department: Basic Science of Engineering Year : 1st (First) Part: Electric Eng. Time Allowed: 3 hours Date: 05 / 01 / 2014.

Important: This exam. Measures ILOY's no (a1-1,a1-2,b3-1,b3-2, ,c1-1,c1-2 , d3.....)
Remarks: No of pages: 2 No of Questions: 4
Allowed Tables and Charts: None

Answer All the Following Questions: [90Marks]\

Question (1) [20Marks]

a) Determine the velocity of transverse wave in stretched string.
b) A wire of length 30cm emits the fundamental note of frequency 300Hz when under a certain initial tension. If the tension is increased By 10N, the frequency increases to 400Hz. Find the initial tension and mass of wire.

Question (2) [25 Marks]

a) Prove that the intensity of sound waves is directly proportional to the square of its amplitude.
b) Describe and explain Doppler effect.
c) An ambulance travels down a highway at a speed 40 m/sec. Its siren emits sound at a frequency of 450Hz. What is the frequency heard by a passenger in a car traveling at 30 m/sec in the opposite direction as the car approaches the ambulance and as the car moves away from the ambulance. (Speed of sound 340 m/sec).

Question (3) [20 Marks]

a) Prove that the total energy of electron in hydrogen atom is inversely proportional to the square of quantum number.
b) The radius of third Bohr orbit in hydrogen atom is 0.22 nm. Compute the speed of the electron in this orbit and its frequency of rotation. Compare the wavelength of the radiation which it would emit if considered as a classical antenna with the second line in the Balmer series. ($m_e = 9.1 \times 10^{-28}$g, $h = 6.62 \times 10^{-34}$ J.Sec).

Question (4)

[25 Marks]

a) Determine the relation between electric field, E, and magnetic field, B, in an electro-magnetic waves.

b) Explain: (i) displacement current, (ii) impurity semiconductor.

c) Prove that the intensity of the interference light waves is directly proportional to the square of its amplitude.

مع أطيب الأمنيات بالتوفيق والنجاح

أ.د / السيد محمد فرج عبدالرحيم

This exam measures the following ILOs														
Question Number	Q1-a	Q2-c				Q2-d	Q3-a				Q3-b	Q4-c			
Skills	a2-1	a5-2				b4-1	b5-2				c4-1	c8-1			
	Knowledge & Understanding Skills					Intellectual Skills					Professional Skills				

a