Scan quizz 2 07/01/15

Group: 71

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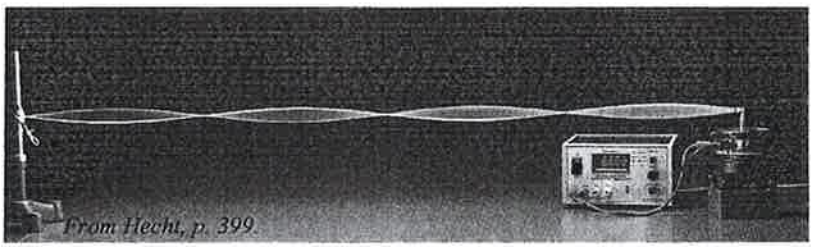
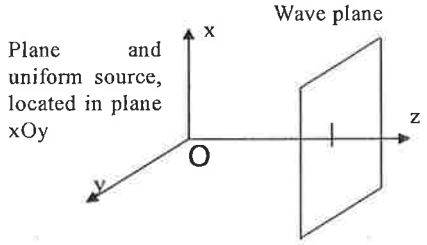
Specify, respectively with a letter T or a F, which of the following statements or properties are True or False .

1)	Questions on Chapter 1 (Waves)	
	a. For transverse waves the polarization if parallel to the direction of propagation	F
	b. The velocity of propagation $\vec{V}$ of the wave and the velocity $\vec{v}$ of the particles represent the same concept	F
	c. This pattern corresponds to a progressive wave: 	0 F
	d. For harmonic waves, one wavelength corresponds to a change in phase of 2π.	0 T
2)	Questions on Chapter 2 (Waves)	
	a. The velocity of transverse waves propagation on a string verifies: $V^2 = \sqrt{\frac{T_0}{m_\ell}}$	F
	b. In the context of acoustic waves, the wave equation is: $\frac{\partial^2 u}{\partial z^2} - \frac{1}{V^2}\cdot\frac{\partial^2 u}{\partial t^2} = 0$	T
	c. In the context of acoustic waves, for a wave propagating along increasing z, the overpressure p and the velocity of displacement of the particles are linked by: $p = Z.v$.	T
	d. The expression sin(kz).cos(wt-kx) represents a progressive, plane and uniform wave, propagating along increasing x.	F
3)	Questions on Chapter 3 (Waves)	
	a. In the case of electromagnetic progressive and uniform plane waves: $V^2 = \frac{1}{\mu\varepsilon}$	T

0.5

1

b. For a uniform plane wave propagating along the z-direction from a source as shown in the figure :



Regarding the space variables, the E- and B-fields depend neither on x nor on y but only on z — T

c. For uniform and progressive plane waves: $\vec{B} = \frac{\vec{n}}{V} \wedge \vec{E}$ — T

d. For harmonic, uniform and progressive plane waves, $\vec{E}$ and $\vec{B}$ do not reach their maxima and their zeroes at the same time (they are shifted). — F

0.5

4) Questions on Chapter 6 (Electromagnetism)

a. Consider a sinusoidal signal with a frequency of 50Hz, if its propagation velocity is $V=2.10^8$ m.s^{-1}, one is justified to use the general electromagnetic field theory to analyze its behavior. — F

b. Concerning induction phenomenon, the general expression of the induced e.m.f. is: $e_{(t)} = \oint_{(\Gamma)} \vec{E}_i . \overrightarrow{d\lambda} + \oint_{(\Gamma)} (\vec{v} \wedge \vec{B}) . \overrightarrow{d\lambda}$ — T

c. In the general case of time-dependent fields, we take into account: - the electromagnetic induction, - the propagation phenomenon, - the fact that charge accumulation can occur only at terminals of capacitors — F

d. The Poynting vector or power density vector is defined by: $\vec{R} = \vec{E} \wedge \vec{H}$ — T

0.5

5) Questions on Chapter 5 (Electromagnetism)

a. Considering polarizing charge densities, the volume charge density of the polarizing charge ρ' is defined by: $\rho' = -\, div\, \vec{P}$ — T

b. If medium 1 and medium 2 are dielectrics and no surface charge has been placed intentionally on the boundary ($\sigma = 0$), there is no refraction of the field lines of $\vec{E}$ at the interface. — T

c. Considering currents of magnetization, the surface current density $\vec{k}'$ is such that: $\vec{k}' = \overrightarrow{Rot}\, \vec{M}$ — F

d. Hard ferromagnetic materials retain their magnetization but present large losses.

0.5