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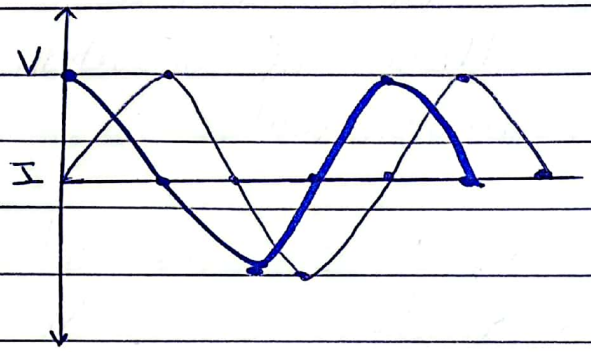
PHYSICS

Subjective TYPE

Question: 3

Relation between I & V in indutor:



1) Voltage leads by current with 90° or $\frac{\pi}{2}$ rad

OR

2) Current lags behind voltage with 90° or $\frac{\pi}{2}$ rad

Question: 4

Frequencies of A.M & F.M

A.M :

It has small frequency range from 540 KHz to 1600 Kz

Where As

F.M

It has large frequency range from 88 MHz to 108 MHz.

Question: 6

Choke coil:

Choke: is a coil of thick copper wire wound closely in large number of turns over a soft iron core.

Use:

It is used in A.C circuits to limit the current with extremely small wastage of energy.

Question: 7

Sol:

inductance = $L = 20mH = 0.02H$; $R = 10\Omega$

voltage = $240\ V$; $f = 180/\pi$

Formula.

$P = VI\cos\theta$

$P = V\left(\frac{V}{Z}\right)\left(\frac{R}{Z}\right) \Rightarrow P = \frac{V^2R}{Z^2} \Rightarrow \frac{V^2R}{\left[\sqrt{R^2 + X_L^2}\right]^2}$

$P = \frac{V^2R}{R^2 + 4\pi^2 f^2 L^2}$

Put values

$P = \frac{(240)^2 (10)}{(10)^2 + 4\pi^2\left(\frac{180}{\pi}\right)^2 (0.02)^2} \Rightarrow \frac{576\,000}{100 + 51.84}$

$\boxed{P = 3793.4W}$

Question: 6

Information	Carrier
1) The actual message or signal to be transmitted.	1) A high frequency signal that carries the information on signal over communiation line.

Question: 1

The frequency response of capacitor is opposite to inductor. We know frequency in C when connected to A.C is:

Capacitor

$$f \propto \frac{1}{X_C}$$

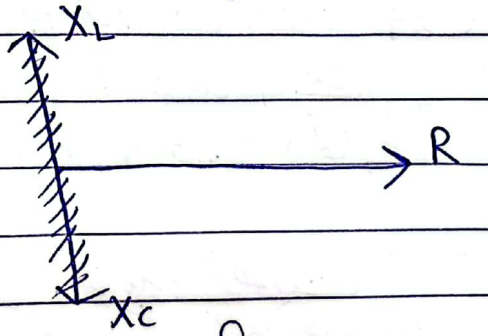
Inductor:

$$f \propto X_L$$

So, in Capacitor X_C is inversely to F and in inductor X_L is directly.

Question: 2

Impedence diagram:



As at resonance frequency $X_L = X_C$ so cancelled and both are in phase so power factor is ($\cos\theta = 0^\circ$) is 1.