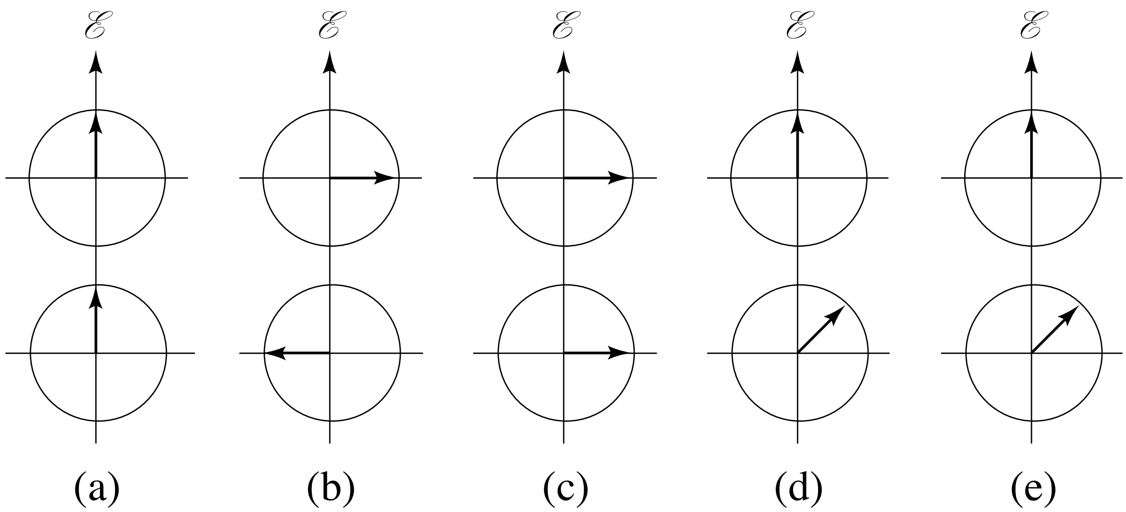
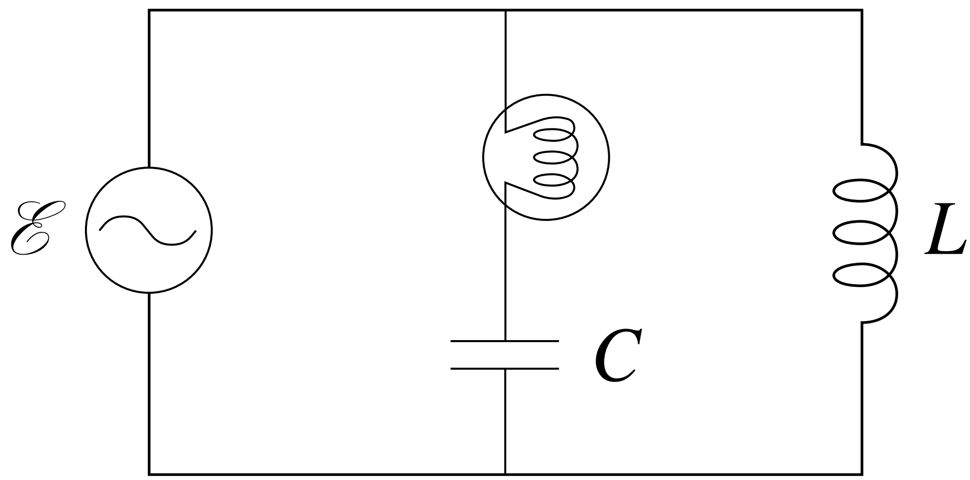
Consider the pairs of phasors below, each shown at $t = 0$. All are characterized by a common frequency of oscillation $w$. If we add the two oscillations together, the maximum amplitude of the phasors is achieved for pair



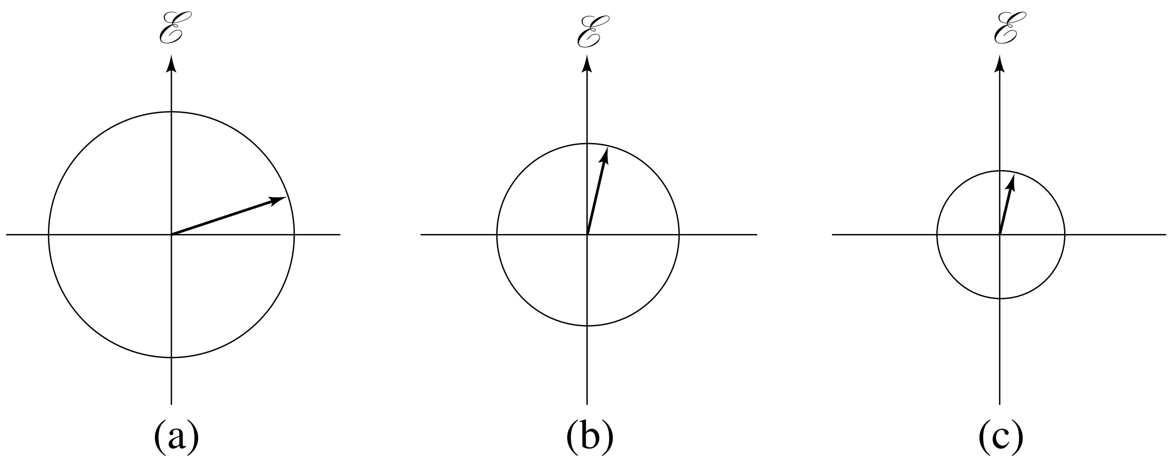

1. ($a$).
2. ($b$).
3. ($c$).
4. ($d$).
5. ($e$).
6. ($a$), ($b$), and ($c$).
7. ($a$) and ($c$).
8. ($b$) and ($c$).
9. need more information

In the circuit shown below, the light bulb has a resistance $R$, and the emf drives the circuit with a frequency $w$. The light bulb glows most brightly at



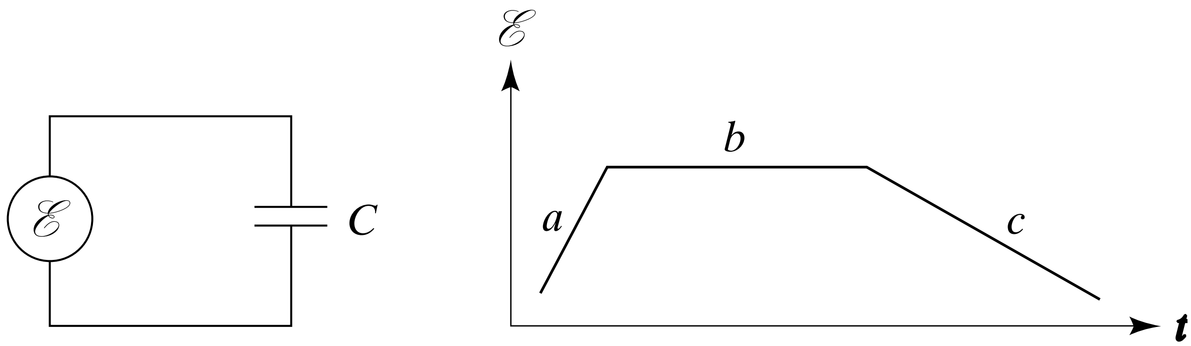

1. very low frequencies.
2. very high frequencies.
3. the frequency $w = 1/(LC)^{1/2}$.

The phasor diagrams below represent three oscillating emfs having different amplitudes and frequencies at a certain instant of time $t = 0$. As $t$ increases, each phasor rotates counterclockwise and completely determines a sinusoidal oscillation. At the instant of time shown, the magnitude of $E$ associated with each phasor is given from smallest to largest by diagrams



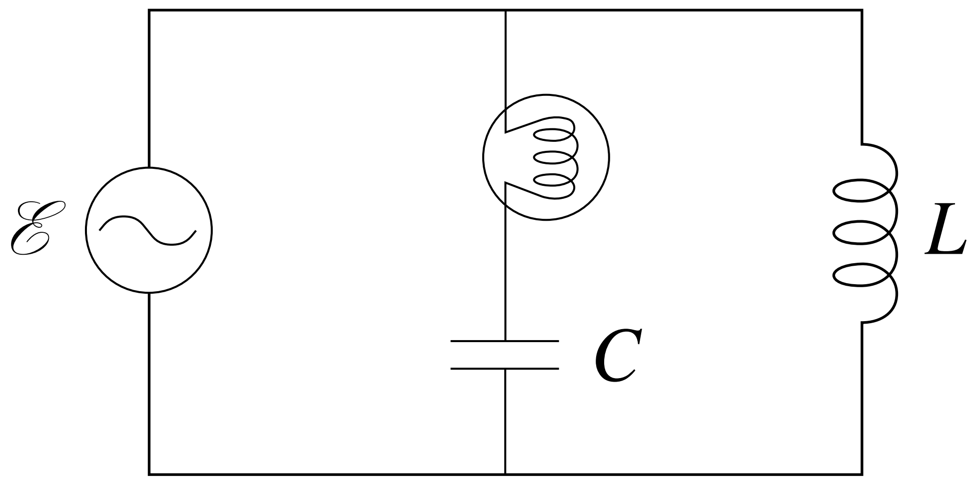

1. ($a$), ($b$), and ($c$).
2. ($c$), ($b$), and ($a$).
3. ($b$), ($c$), and ($a$).
4. ($a$), ($c$), and ($b$).
5. none of the above
6. need more information

A capacitor is connected to a varying source of emf. The work done by the source during the time intervals *a*, *b*, and *c* is



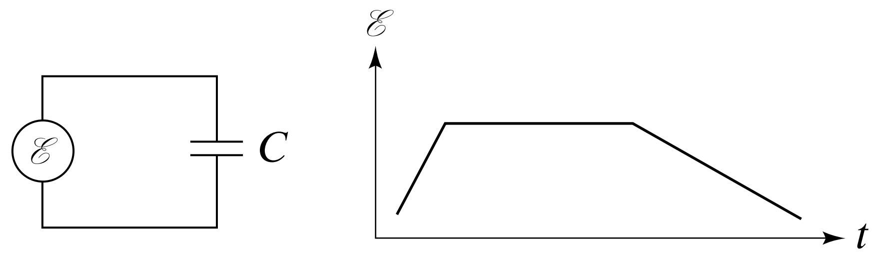

1. positive, negative, and zero, respectively.
2. negative, positive, and zero, respectively.
3. always positive.
4. positive, zero, and negative, respectively.
5. always negative.
6. zero, positive, and zero, respectively.
7. zero, negative, and zero, respectively.

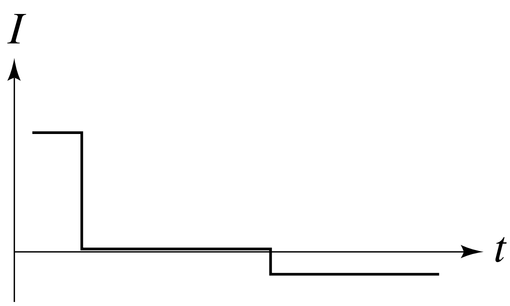
In the circuit shown below, the light bulb has a resistance $R$, and the emf drives the circuit with a frequency $w$. The light bulb glows most brightly at



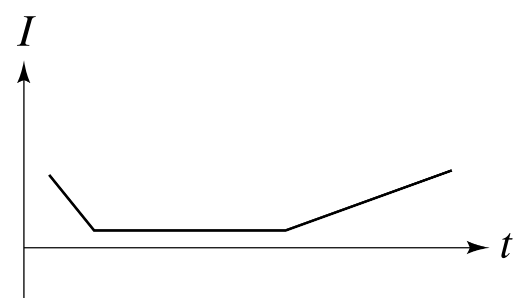

1. very low frequencies.
2. very high frequencies.
3. the frequency $w = 1/(LC)^{1/2}$.

A capacitor is connected to a varying source of emf. Given the behavior of $E$ shown, the current through the wires changes according to:

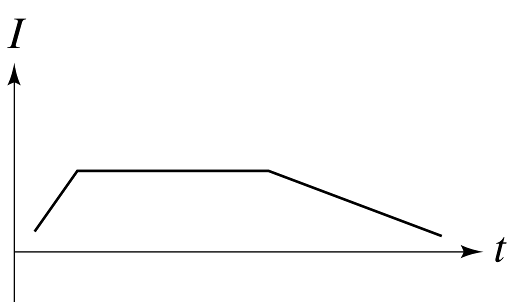


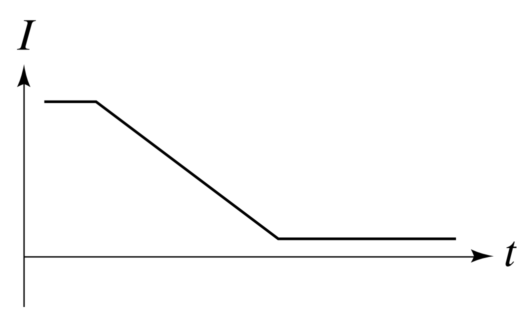

1




2



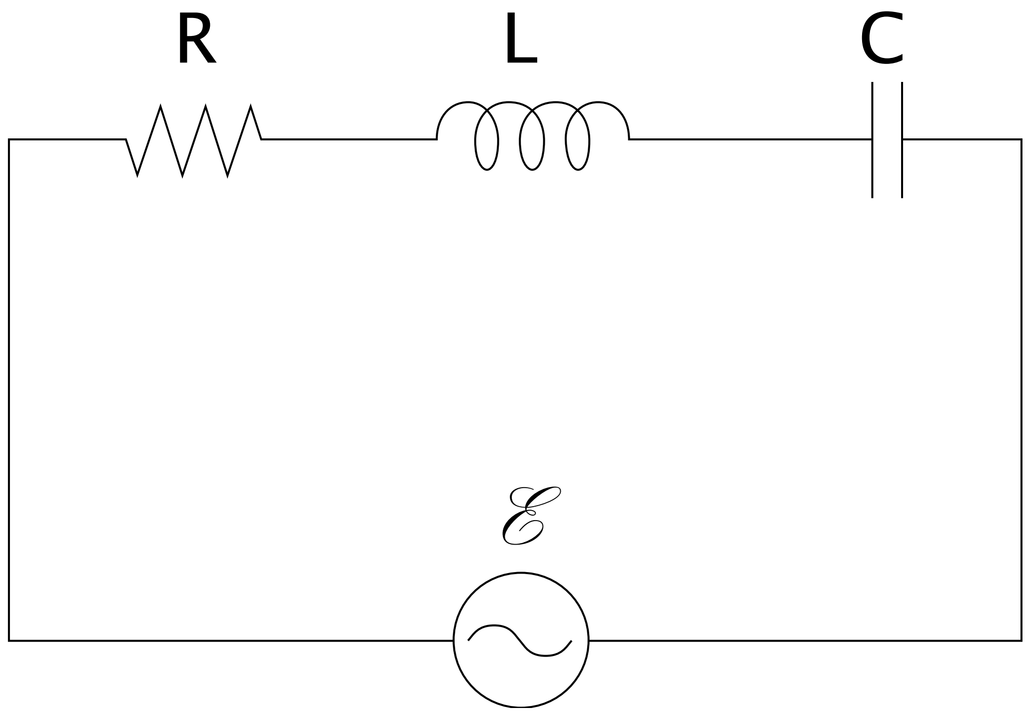

3




4

5. none of the above

For the *RLC* series circuit shown, which of these statements is/are true:




($i$) Potential energy oscillates between $C$ and $L$. ($ii$) The source does no net work: Energy lost in $R$ is compensated by energy stored in $C$ and $L$. ($iii$) The current through $C$ is $90^\circ$ out of phase with the one through $L$. ($iv$) The current through $C$ is $180^\circ$ out of phase with the one through $L$. ($v$) All energy is dissipated in $R$.

1. all of them
2. none of them
3. ($v$)
4. ($ii$)

5. (*i*), (*iv*), and (*v*)
6. (*i*) and (*v*)
7. none of the above