Gate Assignment

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Download latex code from

https://github.com/ArunSiddardha/EE900/tree/main/Gate_assignment/Gate_Assignment.tex

GATE-EC 2007 Q.7

An independent voltage source in series with an impedance $Z_S = R_S + jX_S$ delivers a maximum average power to a load impedance Z_L when

1) $Z_L = R_S + jX_S$
2) $Z_L = R_S$
3) $Z_L = jX_S$
4) $Z_L = R_S - jX_S$

SOLUTION

Maximum power transform theorom:
In AC circuit, the maximum power transfer theorem is stated as: In a linear network having energy sources and impedances, the maximum amount of power is transferred from source to load impedance if the load impedance is the complex conjugate of the total impedance of the network.

So, since its an independent voltage and impedance is $Z_S = R_S + jX_S$ if load impedance(Z_L) is conjugate to it then it deilvers maximum power from the above theorom. so,
$Z_L = R_S - jX_S$. **option 4**