

ECE 2300

Recitation Class 5

Renxiang Guan



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- Make-up Lecture on Sunday!
 - We are not meeting in person on Thursday (June 22nd)
 - Make-up Lecture arranged on Sunday original time

- Quiz this week!
 - After Sunday lecture (8:00 pm – 8:40 pm)
 - Same format as last quiz. Online student need to turn on at least one camera.
 - If you want to take online quiz, notify us beforehand!

5.1 Boundary Value Problem



- Laplace' s Equation:

5.1 Boundary Value Problem



5.1 Boundary Value Problem



Possible Solutions of $X''(x) + k_x^2 X(x) = 0$

k_x^2	k_x	$X(x)$	Exponential forms [†] of $X(x)$
0	0	$A_0 x + B_0$	
+	k	$A_1 \sin kx + B_1 \cos kx$	$C_1 e^{jkx} + D_1 e^{-jkx}$
-	jk	$A_2 \sinh kx + B_2 \cosh kx$	$C_2 e^{kx} + D_2 e^{-kx}$

Ex.1 Boundary Condition



Ex.1 Boundary Condition



5.2.1 Steady Electric Currents



- Current Density:

5.2.2 Steady Electric Currents



- Ohm's Law:

5.2.3 Kirchhoff's Laws



- Voltage Law:

5.2.3 Kirchhoff's Laws



- Current Law:

5.2.4 Joule's Law



- This is a Law about power and heat generated on (a) resistor(s)

5.2.5 Boundary conditions



- Steady current density:
 - Differential Form:
 - Integral Form:

5.2.5 Boundary conditions



- At the connecting surface of different conductors:
 - Normal:
 - Tangential:



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Thank You

Credit to Deng Naihao for this slides & information