

ECE 3600 Final Exam Study Guide

Review: Monday, 12/9, 4:00 pm in regular classroom

Final Exam: Tuesday, 12/10, 1:00 pm in regular classroom

Arn will be in WEB L105 Friday 12/6 1:00 - 4:00 for a ECE 2210 review and Monday 8:00am - 10:00 for their Final

First part of Exam is **Closed book, Closed notes, No calculator**, ~ 30 - 90 points.

The second part will be **Closed book**, except for the note sheets handed out in class for exam 1 and exam 2 and the final. You may add to these sheets. The second part will be problems. Total: 160 points, both parts.

I've been extremely frustrated that some students don't seem to be learning the basic concepts, relying instead on "formulas" and examples. You may want to keep this in mind while studying.

The exam will cover

1. Material from Exam 1 and Exam 2

2. HW 1 AC steady-state review, used extensively throughout class

3. **HW 2 RMS & Single-phase AC power. Possibly part of 3 ϕ problem**

P Q S $|S|$ pf correction of pf

4. HW 3 Energy sources, plant efficiencies

5. **HW 4 & 5 3-phase AC power.**

V_L V_{LL} V_{LN} I_L I_{LL} I_Y $S_{3\phi}$ $S_{1\phi}$
 $Z_Y = \frac{Z_{\Delta}}{3}$ $Z_{\Delta} = 3 \cdot Z_Y$ pf correction of pf

6. HW 6 Magnetic circuits

$B = \mu \cdot H$ $H = \frac{N \cdot i}{l_m}$

7. HW 7 - 9 Transformers

Calculations

Impedance transformation

OC & SC Tests --> model

η & VR

Autotransformers

3 ϕ Transformers Δ & 3rd harmonic

Possible questions

Study the questions from exam 1 and 2

Basic relationships and units

Lots possible

Basic magnitude and phase relationships

Flux density, Field intensity, Permeability, B-H curve. effects of nonlinearity on some currents (3rd harmonic).

Basic relationships

losses, ideal/non construction, ratings, magnetization reactance, core losses, winding losses, leakage reactance.

Autotransformers

questions

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8. HW SG1 & SG2 Synchronous generators and motors

Know the phasor diagram!

Basic relationships

losses, construction, limits, operation

9. HW Ind1 - Ind3 Induction motors

Know the model!

Powers P_{AG} P_{conv} P_{out} etc. η

Torque & speeds

Types & effect of R_2

Single phase motors

Basic relationships

Poles, slip, why, how

Question 7-11 HW17, p3

Typ torque-speed curves

Single phase starting

10. HW DC1 - DC2 DC motors

Know the model!

Powers P_{conv} P_{out} etc. η

Torque & speeds

Series-wound & universal motors

Basic relationships

Torque-speed curve

Torque-speed curve

11. HW TL1 Transmission Lines

Short, **Med**, Long Z_C SIL

Series impedance Z_{series} Shunt admittance & $\frac{Y_{shunt}}{2}$
Shunt impedance & $2 \cdot Z_{shunt}$

Models and calculations

Basic relationships

Common line voltages

Short, Med, Long mi, km

Surge impedance

Surge impedance loading

What is & why use bundling

12. All Labs

questions

13. All Field trips

questions

Bolded items are more likely