

Exam is **closed book**, except for the note sheets handed out in class for exam 1, 2 and exam 3. You may add to these sheets. The first part will be questions, ~ 15 - 25 points. The second part will be problems.

The exam will cover

1. Synchronous motors

Know the phasor diagram! Problems like Hw SG3

2. **3-phase induction motors**

Know how to work with the model.

Powers P_{AG} P_{conv} P_{out} etc. η

Torque & speeds

Types & effect of R_2

No load, Locked rotor, DC tests to find model

3. **Single phase induction motors**

Phase shift calculations

4. **DC motors**

Know the model!

Powers P_{conv} P_{out} etc. η

Torques & speeds & speed control

Torque / speed curves

Series-wound & universal motors

5. Homeworks SG3 - DC2

6. Lab 3

7. Download old exams from HW page on class web site. Also look at Exam 2s and Finals and pick out problems that cover the subjects above.

Possible questions

losses, construction, limits, operation

poles - speed

Operation

Slip

Poles - speed

Questions from homeworks

Typ torque-speed curves

What test gives what model part

Operation

Types

Single phase starting

Typ torque-speed curves

Commutator purpose and operation

Basic relationships

DC motor characteristics

PWM

Bringing a generator on line