



COLLEGE OF ENGINEERING & TECHNOLOGY

Department : Electrical & Control Engineering

Lecturer : Dr. Ahmed El-Shenawy

Course : Electric Engineering II

Course Code : EE 326

Marks : 40

Date : 12/1/2015

Time : 2 hour

Final Exam

Answer all the following questions

Question (1) (10 marks)

- (a) Explain the Construction of a DC Generator and how the DC output is generated.
- (b) A shunt generator supplies a load current of 100 A at 220 V, the efficiency of the generator is 86% and the windage, friction and core losses are 1.1 kW. If the shunt field resistance is 110Ω , calculate the armature resistance.

Question (2) (10 marks)

- (a) Explain the types of losses found in the Transformer and explain the theory of operation of a transformer.
- (b) A single phase transformer rated 220/240V, 50Hz has an equivalent resistance (R_{eq}) & reactance (X_{eq}) referred to the primary side equal to 0.02Ω & 0.2Ω respectively. The transformer is feeding a 3kW, 0.8 lagging Power factor load at 240V. Find:
- The primary voltage
 - The voltage regulation
 - The transformer efficiency

Question (3) (10 marks)

- (a) For the Systems shown below

$$\frac{K}{(s^2 + 2s + 9)}$$

Determine the gain K so that the system will have a damping ratio of 0.5 for this value of K determine the settling time, peak overshoot and time to peak overshoot for a unit-step input.

Members of course Examination Committee:	Signature:	Date:
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Course Coordinator : Dr. Ahmed Kadry		31/12/2014
Head of Department: Prof. Hamdy Ashour		31/12/2014

(b) Find the Transfer function $E_o(s)/E_i(s)$ for the circuit shown below

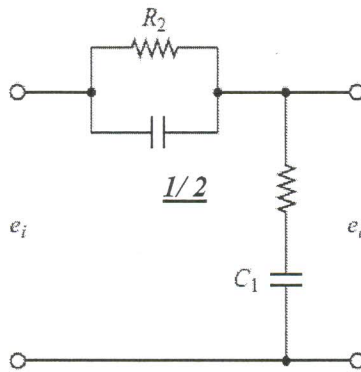


Figure (1)

Question (4) (10 marks)

(a) Explain the rotating magnetic fields principle, which is used in operating the induction motor.

(b) A 3-phase, 500V, 50Hz, 6-pole, star connected induction motor develops (net outputs) 20hp at 950rpm with power factor 0.85 lagging The mechanical losses are 1 hp & total stator copper losses are 1500W (Neglect core losses) Calculate for these loads:

- i. The slip
- ii. The rotor copper losses
- iii. The line current

BEST WISHES

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