

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
ELECTRICAL ENGINEERING DEPARTMENT

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EE-360 (142)

Key Solutions

Quiz # 4

Sec. 1 – 2 – 3

Serial #

Name:

I.D.#

Circle the correct answer.

A 1500-KVA, 2300-V, 60-Hz, Y-Connected alternator (synchronous generator) is tested in order to determine its voltage regulation. The results of these tests are:

Open-Circuit Test: $I_F = 28 \text{ A}$ $V_{Loc} = 900 \text{ V}$

Short-Circuit Test: $I_F = 28 \text{ A}$ $I_{Lsc} = 377 \text{ A}$

DC-Resistance Test: $I_{DC} = 100 \text{ A}$ $V_{DC} = 32 \text{ V}$

The machine delivers full-load voltage at 0.8 lagging power factor. Assume that the effective armature resistance (its AC value) is 1.5 its DC value.

1) The armature resistance is (3 Marks)

- a- 0.16 Ohm
- b- 0.24 Ohm**
- c- 1.36 Ohm
- d- 2.375 Ohm

2) The synchronous reactance is (3 Marks)

- a- 0.16 Ohm
- b- 0.24 Ohm
- c- 1.36 Ohm**
- d- 2.375 Ohm

3) The machine is (2 Marks)

- a- under excited lagging
- b- over excited lagging**
- c- under excited leading
- d- over excited leading

5) The phasor diagram for this machine is **(answer is "c")** (2 Marks)

