

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
ELECTRICAL ENGINEERING DEPARTMENT

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EE-360 (152)

Key Solutions

Quiz # 4

Sec.

Serial #

Name:

I.D.#

Circle the correct answer.

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

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

Short-Circuit Test: $I_F = 14 \text{ A}$ $I_{Lsc} = 86.5 \text{ A}$ (line-current)

DC-Resistance Test: $I_{DC} = 100 \text{ A}$ $V_{DC} = 40 \text{ V}$

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

1) The armature resistance is (4 Marks)

- a- 0.2 Ohm
- b- 0.90 Ohm**
- c- 5.20 Ohm
- d- 9.00 Ohm

2) The synchronous reactance is (4 Marks)

- a- 0.20 Ohm
- b- 0.90 Ohm
- c- 5.20 Ohm
- d- 9.00 Ohm**

3) The phasor diagram for this machine is (answer is "b") (2 Marks)

