## KING FAHD UNIVERSITY OF PETROLEUM & MINERALS **ELECTRICAL ENGINEERING DEPARTMENT** Dr. Ibrahim O. Habiballah

EE-360 (142)

## **Key Solutions**

Ouize #4 Sec. 1 - 2 - 3Serial # 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:

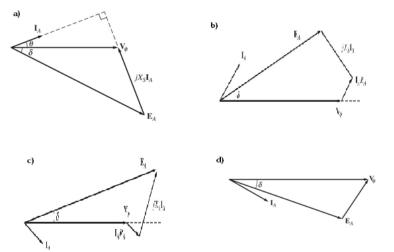
 $V_{Loc} = 900 V$ Open-Circuit Test:  $I_F = 28 \text{ A}$  $I_{Lsc} = 377 \text{ A}$ Short-Circuit Test:  $I_{F} = 28 \text{ A}$ DC-Resistance Test:  $I_{DC} = 100 \text{ A}$  $V_{DC} = 32 V$ 

The machine delivers full-load voltage at 0.8 lagging power factor. Assume that the effective armature resistance (its AC value) is1.5 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)