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Quiz 5 ser#: I.D.: Name:

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: $I_F = 28$ A $V_{Loc} = 900$ V

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

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

Assume the effective armature resistance $R_a = 1.5 \times R_{DC}$. Calculate (the full-load voltage regulation for 0.8 lagging power factors. Draw the phasor diagram for this condition and indicate whether the machine is over or under excited.