Serial: D

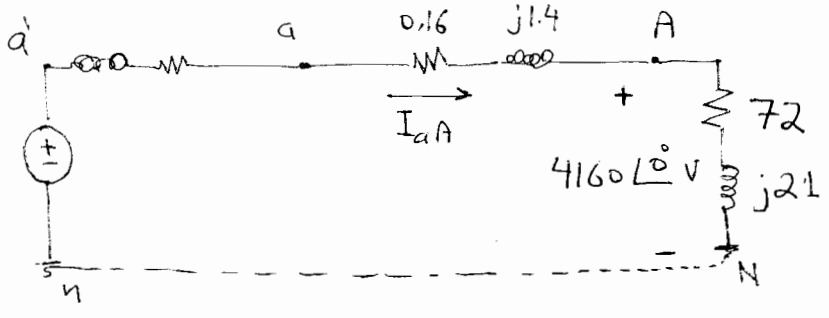
-1 points for not writing the serial number

King Fand University of Petroleum & Minerals
Electrical Engineering Department
EE205: Electric Circuits II (092)
Dr. Ali Muqaibel

Name: KEY

The phase voltage at a balanced Y-connected three-phase load is 4,160 V. The load impedance is 72+*j*21 Ω/Ø. The load is fed from a line that has an impedance of 0.16+*j*1.4 Ω/Ø. Use **a**-phase voltage at the load as a reference.

a) Construct a single phase equivalent circuit. (Show all the known details) **(2 points)**



(2)

b) If the sequence is positive, find the three line-voltages at the source, and illustrate them on the phasor diagram?

$$\vec{I}_{aA} = \frac{4160\angle 0^\circ}{72+j21} = 55.47\angle -16.26^\circ \text{ A} \quad (2)$$

$$\vec{V}_{an} = \vec{I}_{aA}(0.16+j1.4+72+j21)$$

$$= \vec{I}_{aA}(72.16+j22.4)$$

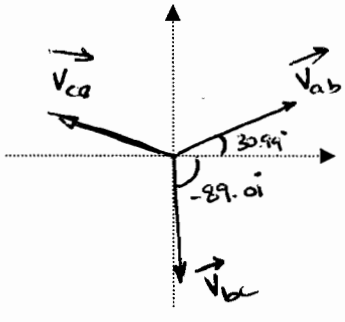
$$= 4190.88\angle 0.99^\circ \quad (2)$$

$$\vec{V}_{ab} = \sqrt{3}\,\vec{V}_{an}\angle 30^\circ = 7258.82\angle 30.99^\circ \quad (1.5)$$

(1.5)

$$\Rightarrow \vec{V}_{bc} = 7258.82\angle -89.01^\circ \text{ V}$$

$$\vec{V}_{ca} = 7258.82\angle 150.99^\circ \text{ V} \quad (1)$$



Good Luck, **Dr. Ali Muqaibel**