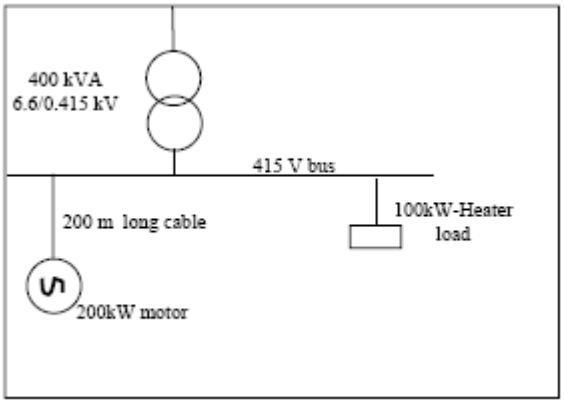
3.	The following single line diagram explain the location of 100 kW heater load and 200 kW motor, which is at 200 mtrs away from 415V, LT bus using suitable cable. The main incoming power factor of system is 0.85 lag. Calculate the rating of capacitors to improve pf of incomer to 0.9 lag.
	 Total Inductive load requiring PF compensation=200kW (since the other 100 kW is a resistive load) Operating PF cos φ1= 0.85 lag. Desired PF cos φ2= 0.90lag kVAr required=kW((tan(cos-1φ1)-tan(cos-1φ2)) =**200**(tan (cos-10.85)-tan (cos-10.90)) =**200**(tan(31.78)-tan(25.84)) =**200**(0.619-0.484) =**200**(0.135) =27 kVAr
Question	**From, R. Malathy, EM 1749 malathy_rahul95@yahoo.co.in** Please refer question bank for energy managers and energy auditor's chapter 3.1 electrical system part – III short type question No.3. In the above question it was requested to find out the rating of capacitor to improve p.f of incomer to 0.9 lag from 0.85 lag. *In the solution to find KVAR required the KW was as mentioned 200 KW citing that another 100 KW is the resistive heater load. But as the sum request to find out KVAR capacitor required to improve the p.f of incomer 0.9*. We feel that it should be **300 KW instead of 200 KW** in the p.f to be improved to the total system and not only on motor load.
Reply	From, Mr. K.K.Chakarvarti, Energy Economist, BEE bee@energymanagertraining.com **Your observation is correct and instead of 200 kW, 300kW load should have been taken while working out the kVAR requirement for improving the system pf from 0.85 lag to 0.9 lag. The 0.85 power factor which is observed on the incomer reflects the overall position of the entire load connected in the system and it can not be taken as 0.85 only for the induction motor load. Infect, induction motor's PF in this particular case will be 0.73** (Pl work out the details).