Question 16 (15 marks)

Figure 1 shows a power station that supplies electricity to a small community. The owners decided to switch from DC generation to AC (Figure 2) to save costs and reduce greenhouse gas emissions.

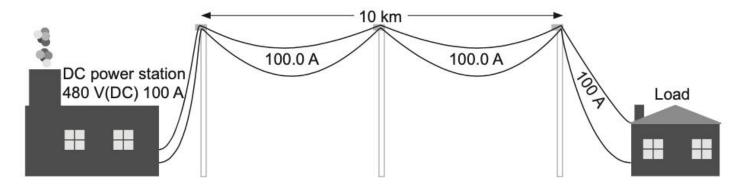


Figure 1: A DC power station

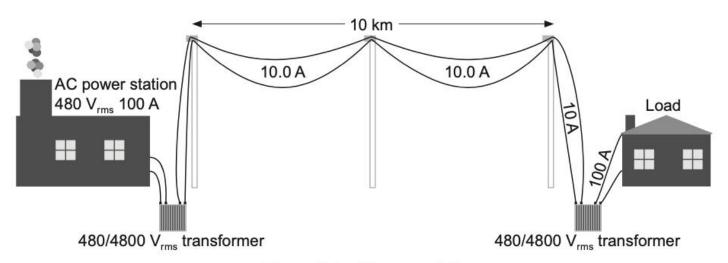


Figure 2: An AC power station

(a) Calculate the power output of both stations in kW. (2 marks)

DC power station AC power station

(b)	estimate the efficiencies of b	mission lines between the pylons is 2.19 × 10- oth systems by calculating power loss in the v e lines to the pylons from the station, and from	vires. Assume
DC po	ower station:	% AC power station:	%

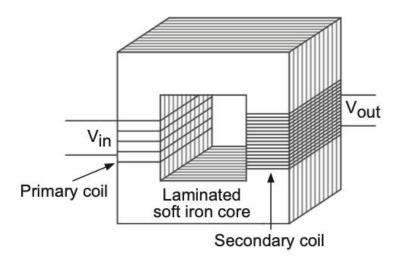


Figure 3: A step-up transformer with a laminated core

efficiency.	ed soft iron core. Explain why la	minating the core increases the transfor (3
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(d)	Explain why transformers require AC current to function in electricity transmission. (4 mag)