Mark Scheme

Q1.

Question number	Answer	Additional guidance	Mark
	substitution (1) $\frac{15 \times 3.1}{230}$ evaluation (1) 0.20 (A)	 allow any value that rounds to 0.20; e.g. 0.2022 award full marks for the correct answer without working	**(2)**

Q2.

Question number	Answer	Additional guidance	Mark
		rearrangement and substitution in either order	**(3)** **AO2**
	substitution (1) $(I_p) \times 230 = 19 \times 2.37$	allow numerical values written above equation	
	rearrangement (1) $(Ip\ ) = (19.0 \times 2.37) \div 230$	$input\ voltage = (output\ voltage \times output\ current) \div input\ voltage$	
	evaluation (1) input current = 0.196 (A)	award full marks for any answer that rounds to 0.2(00) (A) award 1 mark for 5.1(07) (substitution with upside down rearrangement) award full marks for correct answer without working	

Q3.

Question Number:	Answer	Mark
(i)	a power station	**(1)** AO 1 1

Question Number:	Answer	Mark
(ii)	the national grid	**(1)** AO 1 1

Question Number:	Answer	Mark
(iii)	heat loss is reduced	**(1)** AO 1 1

Q4.

Question Number:	Answer	Additional Guidance	Mark
	substitution (1) $(I_s) = \frac{230 \times 0.02}{5.0}$ evaluation (1) 0.9(A)	accept 0.92 (A) award full marks for the correct answer without working	**(2)** AO 2 1

Q5.

		Indicative Content	
		A comparison including some of the following ideas • Transformers can be used or {voltages/curren {changed/transformed} • AC (can transmit) at lower current/high(er) vol • National Grid is (usually) over ground (DC cabl underground) • Less energy lost in transmission • National Grid system can supply to customers • Possible to create a grid linking power stations • More flexibility in voltage for consumer • Consumer can draw large(r) current • More flexibility in power drawn • Great(er) range of devices can be powered Ignore methods of electric	
Level	**0**	No rewardable content	
1	**1 - 2**	• a limited (maybe implied) comparison giving one fact e.g: AC can be at high(er) voltage OR the National Grid can supply houses not close to a power station/ further (away/than the New York system.) • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, punctuation and grammar are used with limited accuracy	
2	**3 - 4**	• a simple comparison including two ideas which may be linked or not eg Nat. Grid can supply whole country and can be used for more appliances (than just lighting). e.g: AC can be transmitted further (than DC) (because it) wastes less energy • the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately • spelling, punctuation and grammar are used with some accuracy	
3	**5 - 6**	• A detailed comparison including at least three ideas, with at least one	

		direct link between two of them. • e.g. AC can be transmitted further (than DC) because AC can be transformed to {lower current/high(er) voltages}. OR AC can be transformed to {lower current/high(er) voltages}. Greater range of devices used. • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors	

Q6.

Question Number:	Answer	Mark
	D transformers have primary and secondary coils. **The only correct answer is D** ***A*** *is not correct because transformers can step-up and step-down voltages* ***B*** *is not correct because transformers can step-up and step-down voltages* ***C*** *is not correct because transformers only work with alternating current*	**(1)** AO 1 1