Name of the Student:_____

Max. Marks : 19 Marks **Time : 19 Minutes**

Mark Schemes

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)**

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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	

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Q3.

Question number	Answer	Additional guidance	Mark
(i)	substitution (1) (power =) 12000 x 0.64 evaluation (1) R = 7700 (W)	 allow (power =) 240 x 32 any answer that rounds to 7700 (W) e.g. 7680 (W) award full marks for the correct answer without working	**(2)** **AO3**

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Question number	Answer	Additional guidance	Mark
(ii)	substitution (1) ($\frac{\text{number of turns in secondary coil}}{\text{number of turns in primary coil}}$ =) $\frac{1600}{80000}$ or $\frac{1}{50}$ evaluation (1) 0.02(0)	0.02(0) to any other power of 10 scores 1 mark award full marks for correct answer without working accept for 1 mark (seen anywhere) $\frac{50}{1}$, $\frac{80000}{1600}$, 50 **or** (from counting turns) $\frac{4}{15}$, 0.27	**(2)** **AO2**

Question number	Answer	Additional guidance	Mark
(iii)	(ratio =) 240 : 12000 (1) 1 : 50 (1)	0.02 : 1 award full marks for correct answer without working	**(2)** **AO2**

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Q4.

Question number	Answer	Additional guidance	Mark
	explanation linking any two from: (smaller currents) reduce heating effect (in cables) (1) less energy / power wasted (in cables) (1) increases efficiency (1)	accept thermal energy for heat energy allow will not get (as) hot / heat loss is reduced allow 2 marks for 'reduce(s) heat energy loss'	**(2)** **AO1**

Q5.

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

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Q6.

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

Q7.

		Indicative Content	Mark
		A comparison including some of the following ideas • Transformers can be used or voltages/currents can be changed/transformed • AC (can transmit) at lower current/high(er) voltage • National Grid is (usually) over ground (DC cables (were) underground) • Less energy lost in transmission • National Grid system can supply to customers further away • 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	**(6)** **Exp**

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		be powered Ignore methods of electricity production	
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	

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Q8.

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

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