Electromagnetic effects

Mark Scheme 5

Level	IGCSE
Subject	Physics
ExamBoard	CIE
Topic	Electricity and Magnetism
Sub-Topic	Electromagnetic effects
Paper Type	(Extended) Theory Paper
Booklet	Mark Scheme 5

Time Allowed: **38 minutes**

Score: **/32**

Percentage: **/100**

1	**(a)**	pump water to higher level storage or heat water or charge accumulators/batteries ignore charge capacitor NOT generator	)) any one)	B1	
	(b)	less/no energy/power/heat loss OR to reduce current OR to allow thinner cables OR more efficient NOTHING ELSE		B1	
	(c)	I^2R		B1	
	(d)	$N_s/1200 = 32000/1100$ OR $N_1/N_2 = V_1/V_2$ in any arrangement 34 880 or 34 900 or 34 909 or 34 910 or 35 000		C1 A1	
	(e)	input power = output power or $V_1I_1 = V_2I_2$ current = power/voltage in any form, words, symbols or numbers 25 A		C1 C1 A1	[8]

2	**(a**	current in spoke in magnetic field	B1	
		causes force on spoke/wheel	B1	[2]
	(b)	arrow to indicate anticlockwise motion	B1	[1]
	(c)	outline of coil, pole pieces	B1	
		d.c. supply connected to brush	B1	
		split rings connected to coil	B1	[3]
	(d)	brushes connect to other split ring every half turn/coil vertical	B1	
		reverses direction of current every half turn/coil vertical	B1	[2]
				[Total: 8]

3 **(a** when magnetic field cuts/cut by conductor/wire/coil/solenoid
OR change in magnetic field linked with coil etc. B1

current/e.m.f caused B1

(b) solenoid ends connected to meter/lamp note: any sign of a cell gets B0 B1
magnet indicated in suitable position on axis of solenoid B1

(c) insert/withdraw/move magnet into/out of solenoid B1
meter gives reading (as magnet moves) OR watch the meter OR lamp glows B1

(d) move magnet faster)
increase strength of magnet) any 2 B1+B1
more turns on solenoid)
closer to solenoid)

[Total: 8]

4 **(a** primary and secondary coils on iron core labelled B1
240 V a.c. to primary, 12 V a.c. to secondary B1
turns ratio shown or stated 20:1, stepdown B1 **3**

(b) (i) must be constantly changing magnetic field B1

(ii) magnetic field of primary passes through core to secondary B1
magnetic field of secondary cuts coil, induces output B1 **3**

(c) (i) 18 W A1

(ii) 540 J A1 **2**

[8]