

Name of the Student: _____

Max. Marks : 21 Marks

Time : 21 Minutes

Mark Schemes

Q1.(a) any **one** from:

- too few turns / coils on the secondary
allow number of turns / coils on the primary was increased
- p.d. across the primary was reduced
ignore human error

1

(b) the p.d. (across the secondary) goes above 2V

allow p.d. across secondary is higher than p.d. across primary after 20 turns

1

(c) it increases (until the nails reach a constant temperature)

1

(d) $\frac{640}{4} = \frac{V_p}{1.75}$

1

$$V_p = \frac{640 \times 1.75}{4}$$

1

$$V_p = 280 \text{ (V)}$$

1

$$280 \times I_p = 336$$

allow their calculated

$$V_p \times I_p = 336$$

1

$$I_p = 1.2 \text{ (A)}$$

allow an answer that is consistent with their calculated value of V_p

1

or

$$336 = I_s \times 1.75 \text{ (1)}$$

$$I_s = \frac{336}{1.75} \text{ (1)}$$

$$I_s = 192 \text{ (A) (1)}$$

$$I_p = 192 \times \frac{4}{640} \text{ (1)}$$

allow

$$I_p = \text{their calculated } I_s \times \frac{4}{640}$$

$$I_p = 1.2 \text{ (A) (1)}$$

allow an answer that is consistent with their calculated value of I_s

an answer of 1.2 (A) scores **5** marks

[8]

Q2.

- (a) P-waves are longitudinal and
S-waves are transverse

1

- (b) 0.4

1

- (c) wave speed = frequency $\times$ wavelength
allow $v = f \lambda$

1

- (d) $7200 = 0.4 \times \text{wavelength}$

1

$$\text{wavelength} = \frac{7200}{0.4}$$

1

$$\text{wavelength} = 18\,000 \text{ (m)}$$

allow up to full marks for ecf using their answer to part (b)

a method shown as

$$7200 \times 2.5 = 18\,000$$

scores **0** marks

1

an answer 18 000 scores **3** marks

- (e) because S-waves cannot travel through a liquid

1

and S-waves do not travel through the (outer) core

allow some (seismic) waves cannot travel through a liquid

and do not go through the core for **1** mark

1

- (f) magnetic field around the coil changes
or
the magnetic field (lines) cut by the coil
allow the generator effect

1

- (g) because the magnet changes direction

(h) stationary

1

(i) any **two** from:

- stronger magnetic field
allow stronger magnet
allow heavier magnet
bigger magnet is insufficient
- more turns on the coil
bigger coil is insufficient
*do **not** accept more coils of wire*
- turns pushed closer together
- spring with a lower spring constant
allow less stiff spring
allow weaker spring
*do **not** accept add an iron core*

2

[13]