

Name of the Student: _____

Max. Marks : 23 Marks

Time : 23 Minutes

Mark Schemes

Q1.

- (a) chicken

allow a correct answer indicated in Table 3 provided the answer space in blank

1

- (b) 2×10^{-6}

1

- (c)

an answer 0.025 (m) scores 4 marks

time = $8\mu\text{s} = 8 \times 10^{-6}$ (s)

or

$4 \times$ their answer to part (b)

subsequent marks may be scored if the number of squares is miscounted or $t = 2\mu\text{s}$ is used

1

distance = $\frac{1}{2} \times 6300 \times 8 \times 10^{-6}$

allow 8×10^3 or 8×10^{-3} or 8×10^{-9} for 8×10^{-6}

1

distance = 0.0252 (m)

allow a correctly calculated answer using 8×10^3 or 8×10^{-3} or 8×10^{-9}

1

distance = 0.025 (m)

allow a calculated value correctly rounded to 2 sig figs

an answer 0.050 (m) scores 3 marks

an answer 0.05 or 0.0504 (m) scores 2 marks

1

- (d) to convert (the pressure variations in) sound (waves) into variations in current / p.d

allow electrical signal for variations in current / p.d.

*do **not** accept amplifies sound*

1

- (e) sound (waves) cause the diaphragm to vibrate

diaphragm moves is insufficient

1

the diaphragm causes the coil / wire to vibrate

do **not** accept moves the coil / wire up and down
if m.p.1 and m.p.2 do not score, allow sound (waves)
cause the coil / wire to vibrate for **1** mark

1

the coil / wire moves through the magnetic field
or
the coil / wire cuts magnetic field lines

1

a potential difference is induced (across the ends of the coil / wire)
allow induced current for induced p.d.

1

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Q2.

(a) The frequency increases and the wave speed in air stays the same

1

(b) pass through soft tissue

allow penetrate for pass through
allow skin/muscle/etc... for soft tissue
pass through tissue is insufficient

1

(but) absorbed by bone

allow do not pass through bone
do **not** accept reflected by bone

1

(c) accept a sensible practical suggestion eg
• complete the investigation standing up
• use (slightly) cooler water
• do not touch the hot cube

do **not** accept use cold water
pour water in carefully is insufficient
ignore wear safety goggles or gloves

1

(d) distance between each side (of the cube) and the (infrared) detector

allow distance between cube and detector

1

(e) measurements (for each surface) have not been repeated (to show that they cluster closely)

do **not** accept any answer for measurement should be
repeated for any reason other than to show they cluster eg
to show accuracy / average / anomalies would be wrong

1

(f) (the student) could not conclude that black surfaces always emit more (infrared) than a white surface

a (matt) white surface (appears to) emit(s) the same
amount (of infrared) as a (shiny) black surface
the conclusion is wrong is insufficient

1

(as) the reading for the matt white and shiny black would both be 66 (°C)

*allow (as) the reading for the matt white and shiny black
would be the same*

1

(g) 0.0

*allow 0
allow zero*

1

(h) at night, more radiation is emitted from the Earth than absorbed from space

1

cloud reflects radiation (towards the Earth)

allow solar radiation for radiation

1

at A, (there is no cloud cover so) a larger proportion of radiation will be emitted into space

1

[12]