Practice Question Set For GCSE
Subject : Physics
Paper-2 Topic: GCSE Triple Science_Waves (SDQ)

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Name of the Student:_____
Max. Marks : 20 Marks **Time : 20 Minutes**

Mark Schemes

Q1.

(a) (i) compare (the health of) mobile phone users with non-mobile phone users

must be an implied comparison between users and non-users
any idea of doing an experiment negates the mark

1

(ii) increase the sample size

accept use more people
accept have a large sample size
repeat the research / test is neutral

1

(iii) ethical

1

(b) (i) so the phones can be compared (fairly)

a fair test is insufficient
accept different tests (may) give different results
*do **not** accept to make the results reliable, unless qualified*
eg all variables are controlled
*do **not** accept bias unless qualified*

1

(ii) yes all are below the legal limit / 2 (W/kg)

or no and any **one** from:

- even absorbing a small amount of energy may be harmful
  accept microwaves for energy
  accept emits energy absorbed by head / other parts of body
- no proof that small amounts of energy are not harmful
  accept because the SAR value is not 0 (W/kg)

1

(c) any **one** from:

- to get an independent opinion
- company scientists may be biased
  accept company scientists may manipulate results

1

[6]

Q2.

(a) the <u>normal</u>

1

(b) v

1

(c) any **one** from:

- light has moved from glass to air / from air to glass
  accept light has changed medium
- speed of light has changed
  beware of contradictions for this marking point eg light has moved from glass to air and slowed down gets zero
- angle of incidence is less than the critical angle
  ***or** (angle) i < (angle) c **or** (angle) y is less than the critical angle*
- change in density (of medium)
  eg glass is more (optically) dense than air

1

(d) (i) ratio of v to y does not give the same answer (in every case)

or value of v doubles value of y does not double

1

or increments for v are the same but increments for y are not the same
*allow for **1** mark a calculation but no conclusion*
eg 30 → 60 19 → 35 (38)

1

(ii) as (angle) v increases, angle y increases
accept as the angle of incidence increases, the angle of refraction increases
***or** there is a (strong) positive(non-linear) relationship between the variables*
***or** ratio of sines is constant*
*do **not** accept angle y is not directly proportional to angle v*

1

(iii) no evidence outside this range
OWTTE

or when angle y is greater than the critical angle total internal reflection occurs

1

[7]

Q3.

(a) (i) (angle of) refraction
*take care **not** to credit 'angle of reflection'*

1

(ii) normal
*do **not** credit 'horizontal'*

1

(b) **either**

(photographic) film

or CCD(s) (charge-coupled device(s)) / CMOS(s) (sensor(s)) / (active) pixel sensor(s)

accept 'LDR(s)' / 'light dependent resistor(s)'

***not** lux meter*

*do **not** accept light sensor(s)*

1

(c) (i) converging

***or** 'convex'*

1

(ii) **either**

(0).35

or (0).4(1...)

*do **not** give any credit for an answer greater than 1*

or

*7 ÷ 20 for **1** mark*

or

*clear evidence that appropriate measuring / counting, has been made for **1** mark*

2

(d) otherwise it will have no effect on the light detector

or otherwise no (real) light will fall on the light detector

***or** 'a virtual / imaginary image will have no effect on the light detector'*

allow error carried forwards for 'light detector'

allow so it can be formed on the film

1

[7]