Name of the Student:_____
Max. Marks : 22 Marks **Time : 22 Minutes**

Mark Schemes

Q1.

(a) **use of infrared:**
remote controls
fibre optic (communications)

1

use of microwaves:
mobile/cell phones
accept mobiles
accept phone signals
satellite (communications/TV)
wi-fi
Bluetooth

1

(b) any **two** from
- same speed
  or
  travel at the speed of light (in a vacuum)
- transverse
  accept a full description of a transverse wave
- transfer energy (from one place to another)
- can be reflected
- can be refracted
- can be diffracted
- can be absorbed / transmitted
- can travel through a vacuum/space
- can be polarised

travels in straight lines is insufficient

2

[4]

Q2.

(a) B
must be in correct order

1

A

1

D

1

(b) (i) mass increases as refractive index increases

accept weight / density increases as refractive index increases

1

(ii) thinner

accept thin

1

heavier

accept heavy

1

(iii) maximum one advantage and one disadvantage of each design

water-filled

advantages:

- lenses are light
- wide range of focal length
- allows fine adjustment
- allows lenses to be altered independently.

1

disadvantages:

- unattractive
- lens might burst
- lens might leak
- uncomfortable.

1

sliding lenses

advantages:

- hard-wearing
- look like conventional glasses
- easy to adjust
- allows lenses to be altered independently.

1

disadvantages:

- heavy
- might slide out of position
- might get dirt between the lenses.

1

(c) any two from:

the image is

- blurred
- coloured
- inverted
- diminished.

accept not focussed

1
1

[12]

Q3.

(a) 1.25

*accept 1.3 for **2** marks*

*allow **1** mark for correct substitution*

ie $\frac{1}{0.8}$

provided no subsequent step shown

2

(b) (i) increasing the length (of the pendulum) decreases the number of oscillations / swings made (in 20 seconds)

accept increasing the length (of the pendulum) increases the time (of 1 oscillation / swing)

accept increasing the length (of the pendulum) decreases the speed / frequency (of 1 oscillation / swing)

answers must refer to the effect of increasing / decreasing length

ignore references to time being proportional to length

1

changing the mass (of the pendulum bob) does not change the number of oscillations / swings made (in 20 seconds)

accept changing the mass does not change the time / speed / frequency / results

accept weight for mass

1

(ii) any **two** suitable improvements:

- measure (the number of swings) over a wider range of (pendulum) lengths
- measure (the number of swings) over a wider range of (bob) masses
- measure the number of swings made over a greater period of time
- repeat each measurement & calculate mean / average (number of oscillations in 20 seconds)

  accept repeat measurements & discard anomalous measurements

  repeat measurements is insufficient
- measure (the total number of swings &) the fraction of swings made
- start the swings at the same height.

  use a computer / datalogger to make measurement (of number of oscillations) is insufficient

  measuring time period is insufficient

  using a stop clock with greater resolution is insufficient

2

[6]