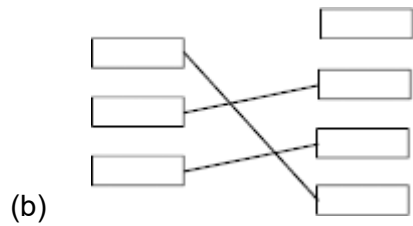


M1. (a) radio

1



*award 1 mark for each correct line
if more than one line is drawn from any em wave then none
of those lines gain credit*

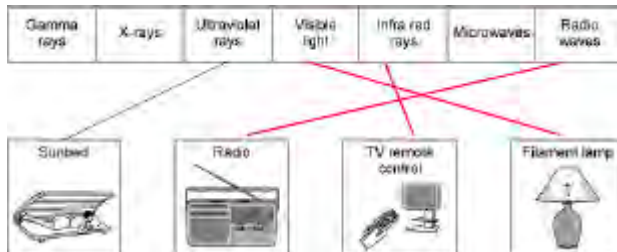
3

(c) ionising

1

[5]

M2. (a) all three lines correct



allow 1 mark for each correct line
if more than one line goes from a device then all lines from that device are wrong

3

(b) (i) skin cancer

do **not** accept cancer
do **not** accept sunburn
correct answer only

1

(ii) other factors may be involved

accept may have been in the Sun too long
accept (over)-use of sunbeds and (over)- exposure to the Sun (both) give the same symptoms accept any other sensible factor that could lead to doubt
do **not** accept irrelevant answers eg may be run over by a car
do **not** accept killed by exposure to the Sun

1

(iii) can assess risk

answers should be in terms of assessing our own health risk

or

make your own decision

accept so you limit its use / don't use one
do **not** accept so you don't get skin cancer
do **not** accept so you don't get sunburn

1

[6]

M3. (a) vibrate / oscillate

*accept a correct description
move is insufficient*

1

(b) 336

*allow 1 mark for correct substitution, ie $420 \times 0.8(0)$ provided
no subsequent step shown*

2

[3]

- M4.** (a) (i) (visible) light
accept visible 1
- (ii) microwaves 1
- (b) J 1
- (c) (i) B 1
- (ii) shorter than 1
- (d) (i) To find out if using a mobile phone is harmful to health 1
- (ii) any **two** from:
- (X has a) low(er) SAR value
"it" refers to mobile phone
accept has a low(er) rate
 - (maximum) energy absorbed (by the head) is less
accept energy emitted (by phone) is less
accept radiation for energy
 - (if mobiles are harmful) less likely to cause harm
accept will not cause harm
accept it is safer

2

[8]

M5. (a) C

1

(b) reflection at the mirror of ray from shoe to person's eye
may be drawn freehand

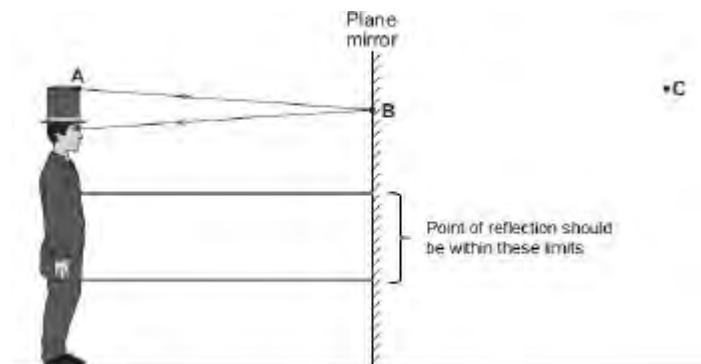
1

angle of incidence = angle of reflection
judged by eye
a ruler must have been used

1

arrow to show correct direction on either incident or reflected ray
only one arrow needed but if more drawn must be no contradiction
both incident and reflected ray must be shown

1



(c) virtual

1

[5]

M6. (a) long 1

(b) lens A 1

it is a concave / diverging lens

this mark is only gained if lens A is stated

any reference to lens material or mass of lens negates this mark

allow it will focus light onto the retina

1

(c) The refractive index of the lens material 1

(d) 4

ignore any signs

allow 1 mark for correct substitution, ie $\frac{1}{0.25}$ provided no subsequent step

2

(e) Cauterising open blood vessels 1

(f) 5

allow 1 mark for correct substitution, ie $\frac{70}{14}$ provided no subsequent step

2

[9]

- M7.** (a) transmits
correct order 1
- absorbs 1
- (b) light
allow ultra violet or UV or infrared or IR or gamma 1
- (c) 20
allow 1 mark for correct working, ie $\frac{60}{3}$ provided no subsequent step 2
- (d) Killing cancer cells 1
- [6]**

M8.	(a)	refraction	1
	(b)	towards the normal	1
	(c)	(i) convex	1
		(ii) principal focus <i>accept focal point</i>	1
	(d)	parallel on left	1
		refracted towards the normal at first surface	1
		refraction away from normal at second surface	1
		passes through or heads towards principal focus	1
	(e)	refractive index <i>accept material from which it is made</i>	1
		(radius of) curvature (of the sides) <i>accept shape / radius</i>	

do **not** accept power of lens
ignore thickness / length

1
[10]

M9. (a) decreases

correct order only

1

increases

1

(b) (i) intensity (of transmitted light) depends on thickness

or

to enable a valid comparison

or

it is a control variable

accept absorption depends on thickness

it would affect the results is insufficient

fair test is insufficient

1

(ii) transmits the least light

or

absorbs the most light

accept very little light is transmitted

*do **not** accept transmits none of the light*

*do **not** accept absorbs all of the light*

any reference to heat negates this mark

1

[4]