

Name:

Edexcel Style

Combined Science GCSE

Light and the Electromagnetic Spectrum Test (Levels 4–9)

Date:

Time allowed: 50mins

Question	Links to Student Progress Sheet	Score	Total marks Available
1	5.11		6
2	5.20,5.21		3
3	5.22		6
4	5.13		15
5	5.22		2
6	5.13		5
7	5.22		8
8	5.23		5
Total			50

Score	Estimated Grade
47 – 50	9
40 – 46	8
33 – 39	7
28 – 32	6
24 – 27	5
20 – 23	4
0 – 19	U

Please be aware that these grade boundaries are Twinkl's own, and may not be in-line with Edexcel's own.

Area for Improvement:

1. (a) Electromagnetic waves are all examples of what type of wave?

(1)

(b) Define the terms wavelength and frequency.

(2)

(c) Below is a diagram of the electromagnetic spectrum.

Complete the missing parts.

(2)

	X-rays	Ultra Violet		Infrared	Microwaves	Radio Waves
10^{-15}m	10^{-10}m	10^{-8}m	10^{-7}m	10^{-5}m	10^{-2}m	$1\text{m} - 10^4\text{m}$

(d) Which of the wave lengths has the highest frequency.

(1)

(Total for Question 1 = 6 marks)

2. Over exposure to electromagnetic radiation can be extremely harmful to humans.

Place a ✓ in the correct place to show the damage that can be done.

The first one has been done for you.

(3)

Damage				
EM wave	Internal Heating of Cells	Skin Burns	Damage Cells and May Produce Skin Cancer	Mutation of Cells
Gamma Rays				✓
Infrared				
Microwaves				
Ultra Violet				

(Total for Question 2 = 3 marks)

3. (a) There are many uses of electromagnetic radiation.

State two uses for each of the following.

(6)

(i) Gamma Rays.

1. _____

2. _____

(ii) Ultraviolet.

1. _____

2. _____

(iii) Infrared.

1. _____

2. _____

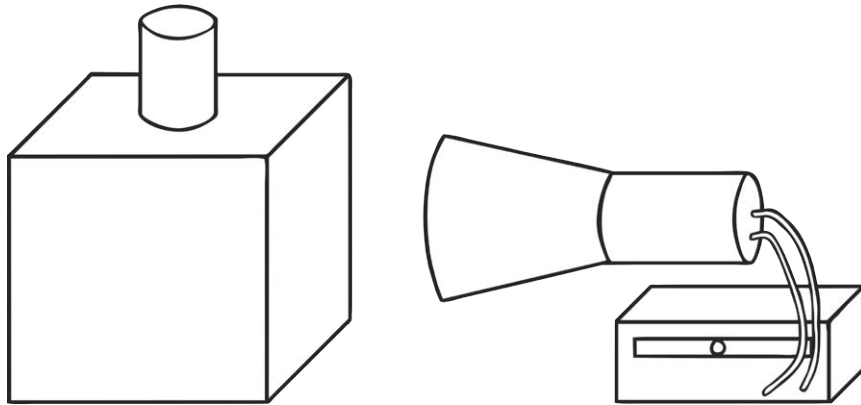
(Total for Question 3 = 6 marks)

4. (a) How does radiation affect the earth's temperature?

(3)

(b) A Leslie cube shown below, can be used to investigate infra red radiation emitted by different surfaces.

The cube is filled with hot water.



(3)

(i) State the independent variable.

(ii) State one control variable.

(iii) State a necessary safety precaution.

(c) Why should the experiment be repeated 3 times?

(2)

(d) Which surface will emit the most infrared radiation?

(1)

(e) A group of students state that their school does not have Leslie cubes or an infrared meter.

Describe how they could carry out a similar experiment to find out which surface emits more energy but this time using equipment such as test tubes.

You will need to include an equipment list.

(6)

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

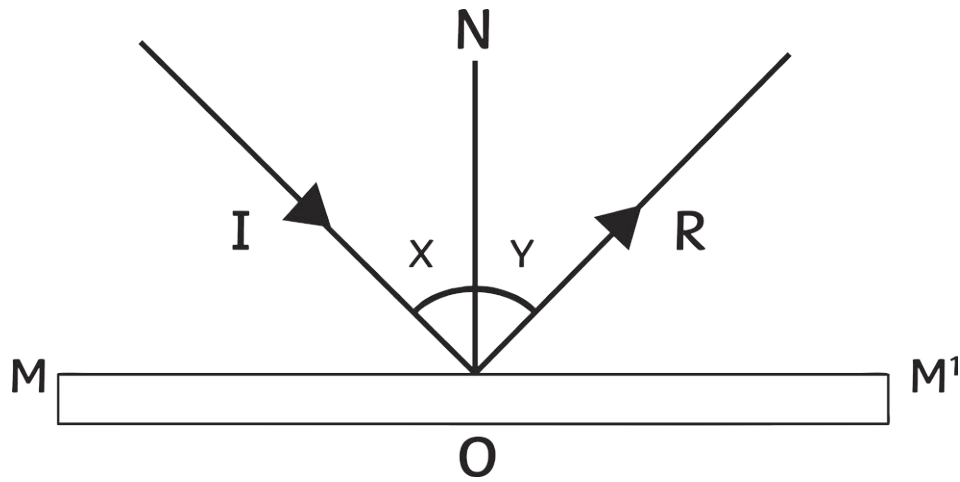
(Total for Question 4 = 15 marks)

5. Explain why radio waves are good for communications, and broadcasting.

(2)

(Total for Question 5 = 2 marks)

6. (a) The diagram below shows a ray of light being reflected in a mirror (MM).



Label the following.

(3)

- (i) Reflected ray
- (ii) Angle of incidence
- (iii) Angle of reflection

(b) State the law of reflection.

(1)

(c) Define the term total internal reflection.

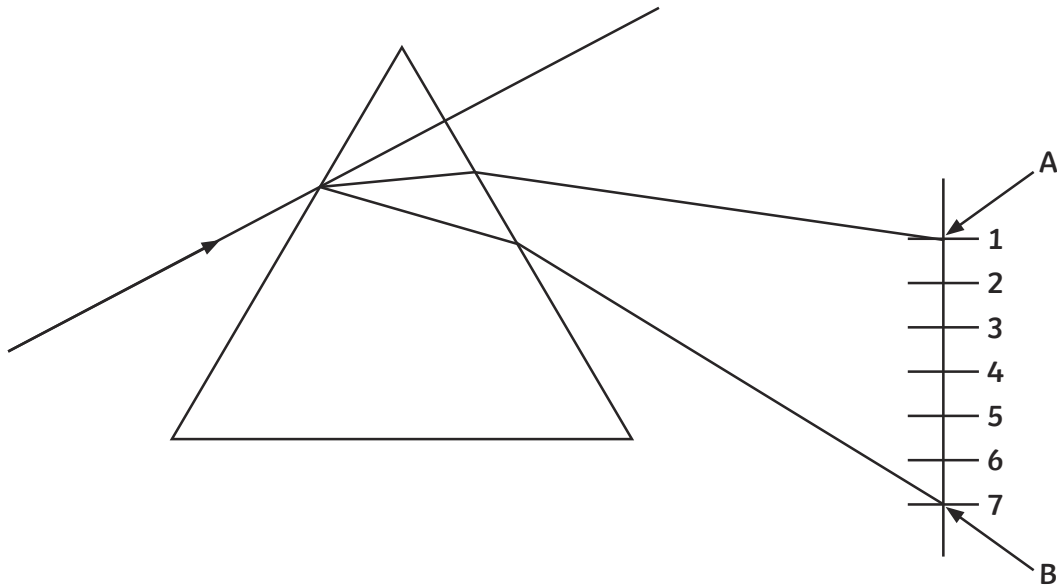
(1)

(Total for Question 6 = 5 marks)

7. A prism can be used to split light from a ray box into the different parts of visible light as shown below.

(a) Label the colours found at A and B

(2)



A = _____

B = _____

(b) Explain how the prism can split the white light into 7 colours.

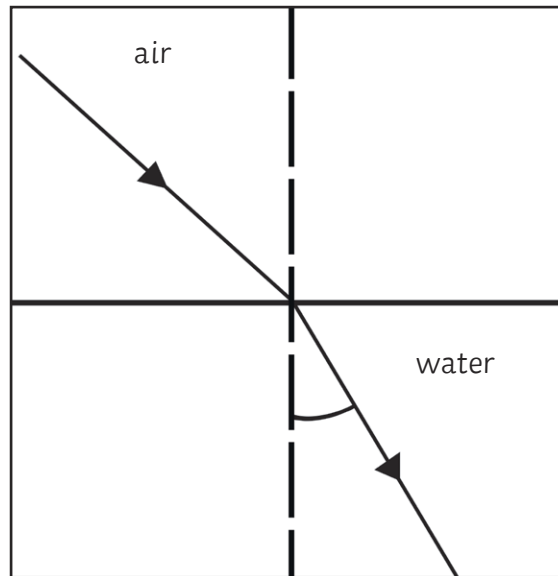
(3)

(c) Explain why a coin dropped into a swimming pool appears to be seen in a different position to its actual position.

(3)

(Total for Question 7 = 8 marks)

8. A ray of light is shone as shown on the diagram.



(a) Does the light travel faster in air or water?

Explain your answer.

(2)

(b) How are radio waves made?

(1)

(c) State 2 uses of infra red cameras.

(2)

1. _____

2. _____

(Total for Question 8 = 5 marks)

TOTAL FOR PAPER = 50 MARKS