Practice Question Set For GCSE
Subject : Physics
Paper-2 Topic: Waves (High Demand Questions)

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Name of the Student:_____

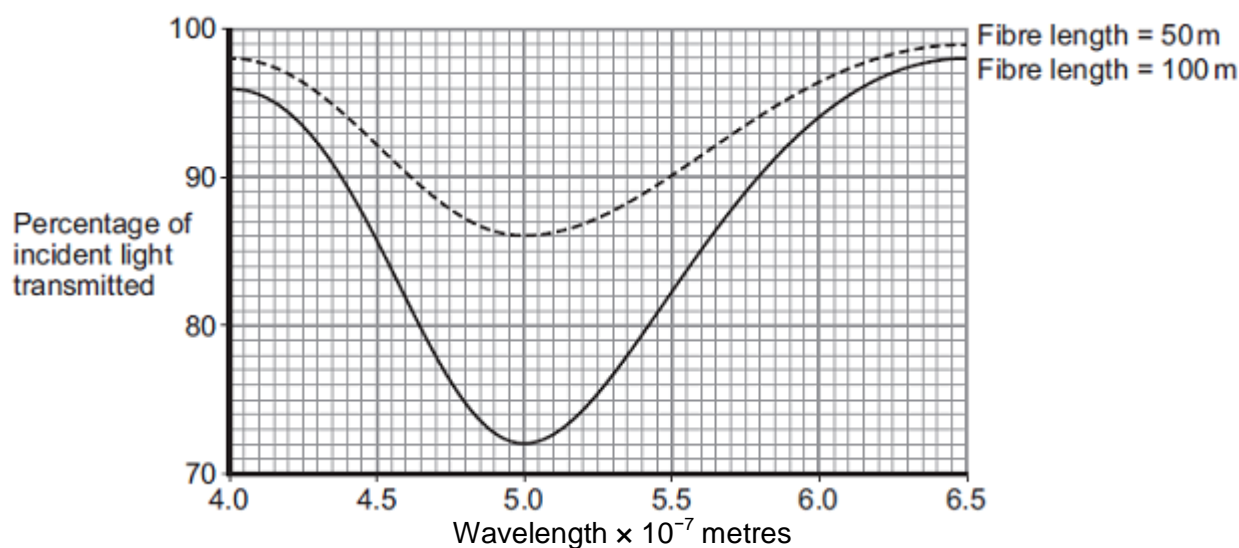**Max. Marks : 22 Marks**   **Time : 22 Minutes**

Q1.

Different wavelengths of light can be used to transmit information along optical fibres.

The graph below shows how the percentage of incident light transmitted through a fibre varies with the wavelength of light and the length of the fibre.

Compare the percentages of incident light transmitted through the two different fibres over the range of wavelengths shown.

_____

_____

_____

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_____

_____

(Total 3 marks)

Q2.

(a)   Electromagnetic waves form a continuous spectrum with a range of wavelengths.

What is the approximate range of wavelengths of electromagnetic waves?

Tick (✓) **one** box.

10^{-15} metres to 10^{4} metres ☐

10^{-4} metres to 10^{15} metres ☐

10^{-6} metres to 10^{6} metres ☐

(1)

(b)   Infrared waves and microwaves are used for communications.

(i)   Give **one** example of infrared waves being used for communication.

_____

_____

(1)

(ii)   A mobile phone network uses microwaves to transmit signals through the air. The microwaves have a frequency of 1.8×10^{9} Hz and travel at a speed of 3.0×10^{8} m/s.

Calculate the wavelength of the microwaves.

Give your answer to **two** significant figures.

_____

_____

_____

Wavelength = _____ m

(3)

(c)   Some scientists suggest there is a possible link between using a mobile phone and male fertility.

The results of their study are given in the table.

Mobile phone use in hours per day	Sperm count in millions of sperm cells per cm^3 of semen
0	86
less than 2	69
2 – 4	59

more than 4	50

The results show a negative correlation: the more hours a mobile phone is used each day, the lower the sperm count. However, the results do **not** necessarily mean using a mobile phone causes the reduced sperm count.

Suggest **one** reason why.

_____

_____

(1)

(Total 6 marks)

Q3.

(a) The wavelengths of four different types of electromagnetic wave, including visible light waves, are given in the table.

Type of wave	Wavelength
Visible light	0.0005 mm
A	1.1 km
B	100 mm
C	0.18 mm

Which of the waves, **A**, **B**, or **C**, is an infra red wave?

_____

(1)

(b) A TV station broadcasts at 500 000 kHz. The waves travel through the air at 300 000 000 m/s.

Calculate the wavelength of the waves broadcast by this station.

Show clearly how you work out your answer.

_____

_____

Wavelength = _____ m

(2)

(c) What happens when a metal aerial absorbs radio waves?

_____

_____

_____

_____

(2)

(d)   Stars emit all types of electromagnetic waves. Telescopes that monitor X-rays are mounted on satellites in space.

Why would an X-ray telescope based on Earth **not** be able to detect X-rays emitted from distant stars?

_____

_____

(1)

(Total 6 marks)

Q4.

(a)   The diagram shows a converging lens being used as a magnifying glass.

(i)   On the diagram, use a ruler to draw two rays from the top of the object which show how and where the image is formed. Represent the image by an arrow drawn at the correct position.

Object

F   F

Eye
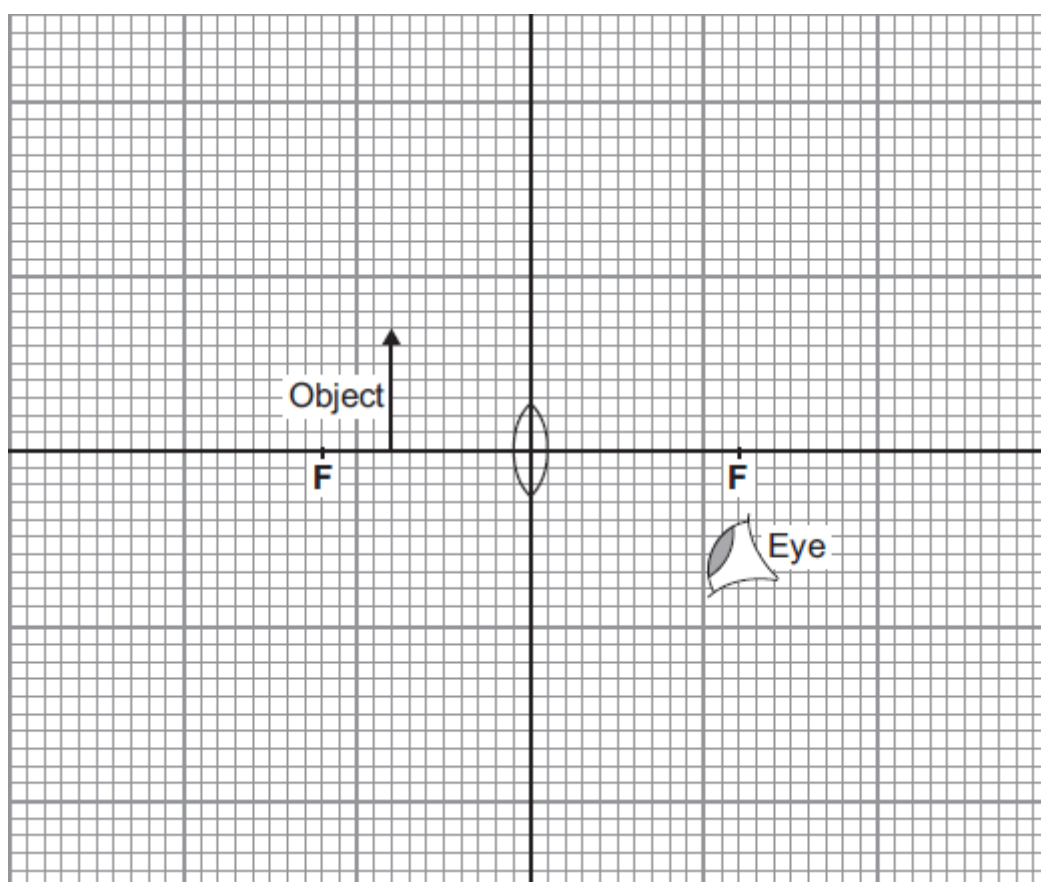
(3)

(ii)   Use the equation in the box to calculate the magnification produced by the lens.

$$\text{magnification} = \frac{\text{image height}}{\text{object height}}$$

Show clearly how you work out your answer.

_____

_____

Magnification = _____

(2)

(b)   A camera also uses a converging lens to form an image.

Describe how the image formed by the lens in a camera is different from the image formed by a lens used as a magnifying glass.

_____

_____

_____

_____

(2)

(Total 7 marks)