Pearson Edexcel GCE Physics

Additional Support Worksheets

The A Level Physics worksheet series are designed to provide support to students in grasping foundational level knowledge of key terms and concepts. By engaging with these materials, students can build strong foundations in key principles. The series encourages active learning through thought provoking questions, so learners can reflect on their understanding and boost confidence.

Contents

1 A water wave has a wavelength of 0.80 m and a frequency of 2.5 Hz.

Which of the following is the speed of the wave in m s^{-1}?

[x] **A** 0.32

[x] **B** 0.4

[x] **C** 0.8

[x] **D** 2

(Total for Question 1 = 1 mark)

---

2 A longitudinal wave is travelling through the air.

Which of the following describes the particles of air in regions of high pressure?

[x] **A** particles are far apart

[x] **B** particle displacement is at a maximum

[x] **C** particles are close together

[x] **D** there is no particle motion

(Total for Question 2 = 1 mark)

---

3 Two points on the same wave are a quarter of a wavelength apart.

Which of the following is the phase difference between the points?

[x] **A** $45°$

[x] **B** $90°$

[x] **C** $180°$

[x] **D** $270°$

(Total for Question 3 = 1 mark)

---

4 Two waves are coherent.

Which of the following can never describe these two waves?

[x] **A** Phase difference is zero

[x] **B** The phase difference is always varying

[x] **C** they are always in phase with each other

[x] **D** They have a constant phase difference

(Total for Question 4 = 1 mark)

---

5 A wave travels along a stretched string with tension T.
The speed of the wave is v.

The tension is increased to 4T

Which of the is the new wave speed?

[x] **A** $2v$

[x] **B** $4v$

[x] **C** $v/2$

[x] **D** it stays the same

(Total for Question 5 = 1 mark)

---

6 A steel guitar string and a nylon guitar string are stretched with the same tension, but the steel string has a much smaller mass per unit length.

The strings are plucked and a wave is produced on each string.

Which of the following statements is correct?

[x] **A** **T**he wave speed is greater on the steel string

[x] **B** The wave speed is the same for both strings.

[x] **C** The wave speed is smaller on the steel string.

[x] **D** The wave speed depends on the amplitude given to the wave when plucked

(Total for Question 6 = 1 mark)

---

7 The intensity of sunlight on Earth's surface is 1.0×10^3 W m^{-2}.

Which of the following is the power in W of the sunlight incident on a solar panel of area 2.0 m^2?

[x] **A** 500

[x] **B** 1000

[x] **C** 2000

[x] **D** 4000

(Total for Question 7 = 1 mark)

---

8 The critical angle at a diamond – air boundary is 24.4°.

A beam of laser light in diamond strikes the diamond 60° to the normal

Which of the following statements is correct?

[x] **A** The beam of laser light refracts into the air at an angle greater than 30° .

[x] **B** The beam of laser light refracts into the air at an angle less than 30°.

[x] **C** The beam of laser light will totally internally reflect

[x] **D** The beam of laser light will partially reflect and partially refract.

(Total for Question 8 = 1 mark)

---

9 A ray of light travels from water with refractive index 1.33 into glass glass with refractive index 1.50. The angle of incidence in water is 40.0°.

Which of the following is an expression for the angle of refraction in the glass?

[x] **A** 25.4°

[x] **B** 28.9°

[x] **C** 34.8°

[x] **D** 46.5°

(Total for Question 9 = 1 mark)

---

10 A lens has a focal length of 25 cm.

Which of the following is the power of the lens?

[x] **A** 0.25 D

[x] **B** 2 D

[x] **C** 4 D

[x] **D** 25 D

(Total for Question 10 = 1 mark)

---

11 A system of two thin lenses, one of power +3.0 D and the other -2.0 D, is placed in contact.

Which of the following is the power of the system?

[x] **A** +1.0 D

[x] **B** +6.0 D

[x] **C** -1.0 D

[x] **D** -5.0 D

(Total for Question 11 = 1 mark)

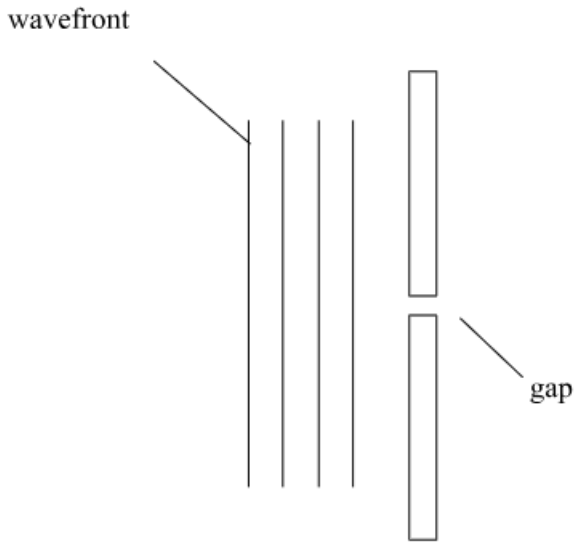
---

12 Which row of the table is correct for a real images and a virtual image?

	Real Image	Virtual image
[x] **A**	created by converging rays	created by diverging rays
[x] **B**	may be projected on a screen	may be projected on a screen
[x] **C**	created by a concave lens	created by a convex lens
[x] **D**	created by a convex mirror	created by a concave mirror

(Total for Question 12 = 1 mark)

13 A series of plane wavefronts are incident on a slit. The width of the slit is smaller than the distance between the wavefronts, as shown.



Which of the following statements is correct?

[x] **A** the wave mostly reflects from the slit edges

[x] **B** the wave spreads out in all directions

[x] **C** the wave passes directly through the slit without spreading

[x] **D** Only waves perpendicular to the slit pass through

(Total for Question 13 = 1 mark)

14 A monochromatic light of wavelength 600 nm is incident on a diffraction grating with 500 lines per mm.

Which of the following expression is the angle of the second-order maximum?

[x] **A** 18.4°

[x] **B** 36.9°

[x] **C** 52.2°

[x] **D** 63.4°

(Total for Question 14 = 1 mark)

---

15 An electron accelerated through a potential difference V.

Which of the following expressions gives the de Broglie wavelength of the electron in m?

[x] **A** $\frac{h}{\sqrt{2meV}}$

[x] **B** $\frac{h}{2meV}$

[x] **C** $h\sqrt{2meV}$

[x] **D** $\frac{\sqrt{2meV}}{h}$

(Total for Question 15 = 1 mark)

---

16 A pulse-echo system uses a 2 MHz ultrasound source in order to detect crack in a metal.

Which of the following will be correct when the frequency of the ultrasound is doubled?

[x] **A** The maximum measurable depth of the crack is halved

[x] **B** The ultrasound diffracts more

[x] **C** the resolution increases

[x] **D** the speed of the ultrasound increases

(Total for Question 16 = 1 mark)

---

17 Which of the following demonstrates the wave behaviour of electrons?

[x] **A** excitation

[x] **B** ionisation

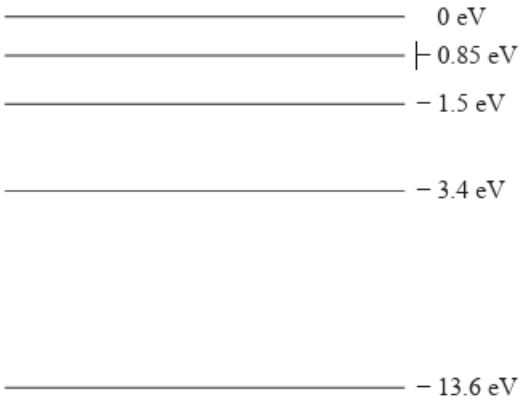
[x] **C** photoelectric effect

[x] **D** diffraction

(Total for Question 17 = 1 mark)

---

18 The diagram shows some of the energy levels for a hydrogen atom.



An electron in the -13.6 eV energy level absorbs a photon and moves to the -0.85 eV energy level.

Which of the following gives the number of frequencies of light that could be emitted when this electron returns to the -13.6 eV level

[x] **A** 1

[x] **B** 2

[x] **C** 4

[x] **D** 6

(Total for Question 18 = 1 mark)

---

19 Two waves leaving the same source each have a wavelength of 4.0 cm. The waves meet after travelling along different paths.

Which of the following would lead to constructive interference when the waves meet?

[x] **A** A path difference of 8.0 cm

[x] **B** A path difference of 6.0 cm

[x] **C** A phase difference of $\frac{\pi}{2}$ radians

[x] **D** A phase difference of 3π radians

(Total for Question 19 = 1 mark)

---

20 Which of the following quantities is never required when calculating the de Broglie wavelength of an electron?

[x] **A** electron mass

[x] **B** electron charge

[x] **C** electron velocity

[x] **D** planck constant

(Total for Question 20 = 1 mark)
