Practice Question Set For A-Level
Subject : Physics
Paper-2 Topic : 5_Waves

Name of the Student:_____
Max. Marks : 20 Marks **Time : 20 Minutes**

Q1.

Answer the question with a cross in the box you think is correct (☒). If you change your mind about an answer, put a line through the box (☒) and then mark your new answer with a cross (☒).

An object is placed 6.5 cm from a lens of focal length 3.9 cm. An image is formed 9.8 cm behind the lens.

Which of the following expressions is equal to the magnification?

☐ **A** $\frac{3.9}{6.5}$

☐ **B** $\frac{6.5}{9.8}$

☐ **C** $\frac{6.5}{3.9}$

☐ **D** $\frac{9.8}{6.5}$

(Total for question = 1 mark)

Q2.

The velocity of a wave on a string is given by $v = \sqrt{\frac{T}{\mu}}$ where T is the tension in the string and μ is a constant.

Which of the following pairs of variables, if plotted, would produce a straight line graph?

(1)

	x-axis	y-axis
☒ **A**	T	$\sqrt{v}$
☒ **B**	v	T
☒ **C**	$\frac{1}{v}$	T
☒ **D**	$\sqrt{T}$	v

(Total for question = 1 mark)

Q3.

Which of the following would increase the amount of detail (resolution) in an ultrasound scan?

☒ **A** faster wave speed

☒ **B** larger wavelength

☒ **C** lower frequency

☒ **D** shorter pulses

(Total for question = 1 mark)

Q4.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

A light source radiates a power P onto a surface, covering a circular area of radius r.

Which of the following is the correct expression for the intensity I of the radiation at the surface?

☒ **A** $I = \frac{P}{\pi r^2}$

☒ **B** $I = P\pi r^2$

☒ **C** $I = \frac{P}{2\pi r}$

☒ **D** $I = 2P\pi r$

(Total for question = 1 mark)

Q5.

An object is placed in front of a lens.

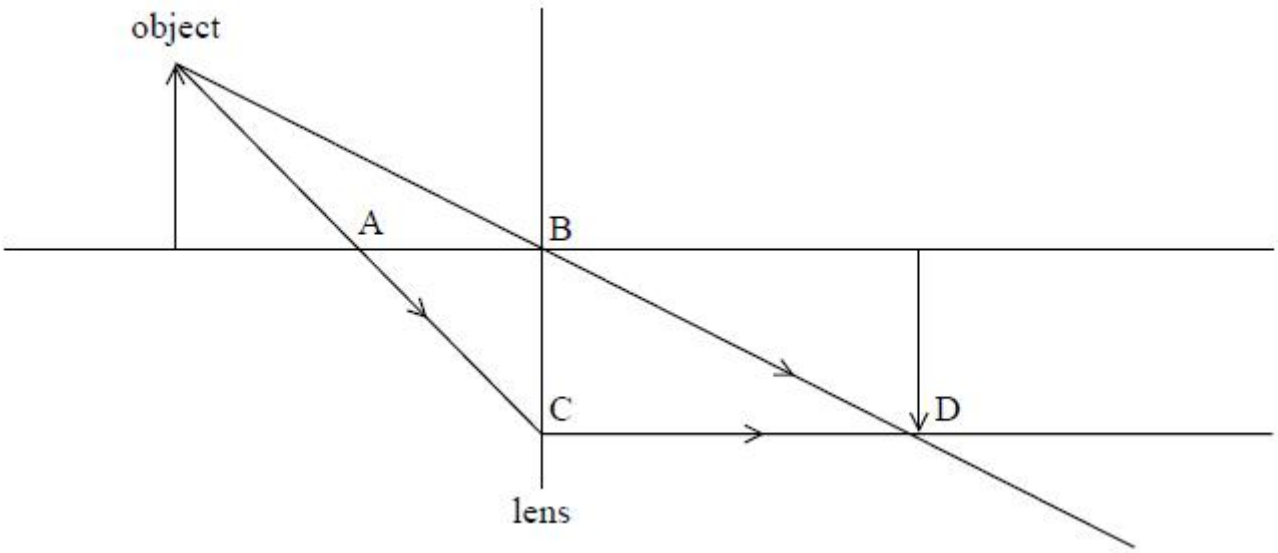
Which row of the table shows a combination that will produce a real image of the object?

	Focal length of lens / cm	Object distance / cm
☒ **A**	−5	10
☒ **B**	−5	2
☒ **C**	5	10
☒ **D**	5	2

(Total for question = 1 mark)

Q6.

The diagram shows how an image is formed by an object that is placed a small distance from a thin converging lens.



Which of the labels A, B, C or D represents the focal point of the lens?

☒ **A**

☒ **B**

☒ **C**

☒ **D**

(Total for question = 1 mark)

Q7.
Which term may be defined as the number of waves passing a point in one second?

- ☒ **A** wave speed
- ☒ **B** wavelength
- ☒ **C** period
- ☒ **D** frequency

(Total for Question = 1 mark)

Q8.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

A detector is placed 30 cm from a gamma source, the count rate is 64 counts per minute.

The detector is then placed 60 cm from the source. The background rate is presumed to be a constant 24 counts per minute.

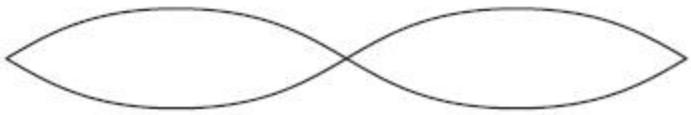
Which of the following gives the expected counts per minute?

- ☒ **A** 16
- ☒ **B** 32
- ☒ **C** 34
- ☒ **D** 44

(Total for question = 1 mark)

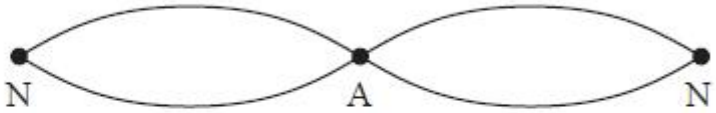
Q9.

The diagram represents a stationary wave on a string.

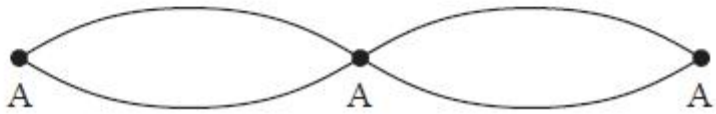


Which diagram correctly shows the position of nodes N and/or antinodes A?

☒ **A** 

☒ **B** 

☒ **C** 

☒ **D** 

(Total for question = 1 mark)

Q10.

A light illuminates a circular area of radius 30 cm. In a time of 20 s the total incident energy from the light is 70 J. The radiation flux can be calculated from

☒ **A** $\frac{70}{(\pi \times 0.30^2 \times 20)}$

☒ **B** $\frac{70}{(\pi \times 0.15^2 \times 20)}$

☒ **C** $\frac{70 \times \pi \times 0.30^2}{20}$

☒ **D** $\frac{70 \times 20}{(\pi \times 0.15^2)}$

(Total for question = 1 mark)

Q11.

A diverging lens is used to produce an image of a real object.

Select the row of the table that correctly identifies the nature of the image produced.

☒	**A**	Real	Upright
☒	**B**	Real	Inverted
☒	**C**	Virtual	Upright
☒	**D**	Virtual	Inverted

(Total for question = 1 mark)

Q12.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

A beam of light from a torch with power *P* is shone onto a surface. The light is spread over a circular area with a radius *r*.

Which of the following gives the intensity of the light on the surface?

☒ **A** $P \times 4\pi r^2$

☒ **B** $\frac{P}{4\pi r^2}$

☒ **C** $P \times \pi r^2$

☒ **D** $\frac{P}{\pi r^2}$

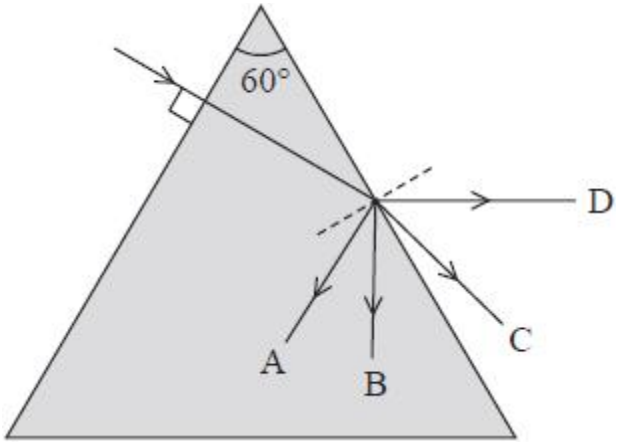
(Total for question = 1 mark)

Q13.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an

answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

A ray of light, in air, is incident on the edge of a triangular glass prism as shown.
The critical angle for a light ray meeting a glass to air boundary is 35°.



Which path, A, B, C or D, will the ray follow?

☒ **A**

☒ **B**

☒ **C**

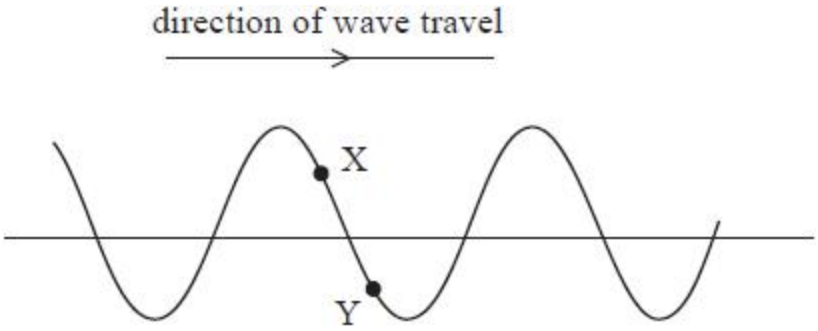
☒ **D**

(Total for question = 1 mark)

Q14.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

The diagram shows the position of two particles, X and Y, on a transverse wave.
The wave is travelling from left to right.



Which of the following describes the directions in which the particles at X and Y are moving at the instant shown?

	Particle X	Particle Y
☒ **A**	down	down
☒ **B**	down	up
☒ **C**	up	down
☒ **D**	up	up

(Total for question = 1 mark)

Q15.

An electron is accelerated from rest through a potential difference of 5.0 kV.
The kinetic energy gained by the electron is

☒ **A** 8.0×10^{-16} J
☒ **B** 8.0×10^{-19} J
☒ **C** 3.2×10^{-20} J
☒ **D** 3.2×10^{-23} J

(Total for question = 1 marks)

Q16.

Which of the following does **not** apply to longitudinal waves?

☒ **A** coherence
☒ **B** polarisation
☒ **C** superposition
☒ **D** transmission

(Total for question = 1 mark)

Q17.

An object is placed 6.5 cm away from a lens of focal length 3.9 cm. An image is formed 9.8 cm from the lens.
Which of the following is the magnification?

(1)

☒ **A** 0.60
☒ **B** 0.66
☒ **C** 1.5
☒ **D** 1.7

(Total for question = 1 mark)

Q18.

A converging lens is used as a magnifying glass. An image is produced that is 30 cm away from the lens and twice as big as the object.

Choose the row that correctly identifies the nature of the image and the object distance.

	Nature of image	Object distance/cm
☐ **A**	real	15
☐ **B**	real	60
☐ **C**	virtual	15
☐ **D**	virtual	60

(Total for question = 1 mark)

Q19.

Answer the question with a cross in the box you think is correct (☒). If you change your mind about an answer, put a line through the box (☒) and then mark your new answer with a cross (☒).

When monochromatic light is incident on the surface of a metal, electrons are emitted by the photoelectric effect.

If other conditions are unchanged, the maximum kinetic energy of the electrons will be increased by

☒ **A** increasing the frequency of the incident light.

☒ **B** increasing the intensity of the incident light.

☒ **C** using a metal with a higher threshold frequency.

☒ **D** using a metal with a higher work function.

(Total for question = 1 mark)

Q20.

A stationary interference pattern is created by the superposition of waves from two sources which are close

together.

For this to occur the waves must

- ☒ **A** be in phase with each other.
- ☒ **B** be transverse.
- ☒ **C** have the same amplitude.
- ☒ **D** have the same frequency.

(Total for question = 1 mark)