Year 11 Physics Test NAME _____

Waves

1. Draw a diagram of a transverse wave. Label the amplitude.

/2

2. Draw a diagram of a longitudinal wave. Label a wavelength.

/2

3. Calculate the period of a pendulum which swings back and forth 1.4 times every second.

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4. (a) Calculate the speed of a water wave that has a frequency of 2.2 Hz and a wavelength of 0.31 m.

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(b) State whether higher frequency water waves move with faster, equal or slower speed.

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5. One particular FM radio station has a frequency of 101.7 MHz. Calculate its wavelength.

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6. When a wine glass is tapped gently, it vibrates with its natural frequency.

   (a) State the name of the vibration if the glass is caused to vibrate by a nearby sound source instead.

   _____ /1

   (b) Explain how the glass can shatter if the nearby sound source is emitting loud sound waves.

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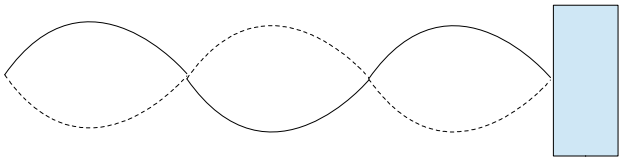
   _____ /2

7. The diagram below shows a standing wave produced by a spring being shaken while attached to a wall:



   (a) Label the nodes on the diagram above. /1

   (b) Explain how the standing wave is formed.

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   _____ /2

8. Consider two tuning forks, one with a frequency of 240 Hz and another with an unknown frequency.

   If three beats are heard every second, calculate two possible values for the unknown frequency.

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   _____

   _____

   _____ /2

9. (a) Which wave has higher frequency: microwave or gamma?

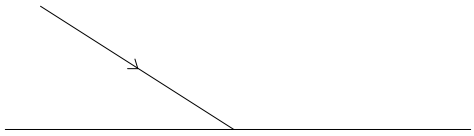
_____ /1

(b) Which wave has a longer wavelength: red or green?

_____ /1

10.

(a) On the diagram below, label the angle of incidence with the symbol θ_i.



/1

(b) On the diagram above, draw the angle of reflection.

/1

11. Use an analogy to describe diffraction. “Diffraction is like...”

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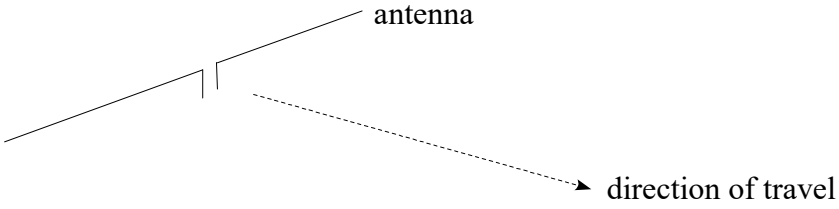
_____ /2

12. The diagram below shows the direction of travel of one wave emitted from a horizontal transmitting antenna.



(a) Draw the wave above and state its plane of polarisation.

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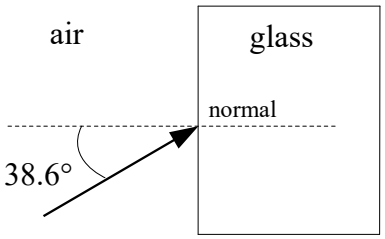
(b) Suggest whether the receiving antenna should be horizontal or vertical.

_____ /1

13. The refractive index of air is 1.00 and the refractive index of glass is 1.55.

(a) Calculate the angle of refraction if light enters glass from air at an angle of incidence of 38.6°.



/2

(b) Calculate the critical angle of glass.

/2

14. Describe any one practical application of wave-related phenomena of your choice.

/2