



2020 Physics 2 Light and Sound Test

Multiple Choice Answer Sheet

Name: Answers Year: 9

Multiple Choice – 20 questions.

Circle your choice. If you change your mind, scrub your choice out and circle the one you want. If it is messy, clearly write your choice next to question.

1. A B C D
2. A B C D
3. A B C D
4. A B C D
5. A B C D
6. A B C D
7. A B C D
8. A B C D
9. A B C D
10. A B C D
11. A B C D
12. A B C D
13. A B C D
14. A B C D
15. A B C D
16. A B C D
17. A B C D
18. A B C D
19. A B C D
20. A B C D

Correct answers: _____ / 20 questions

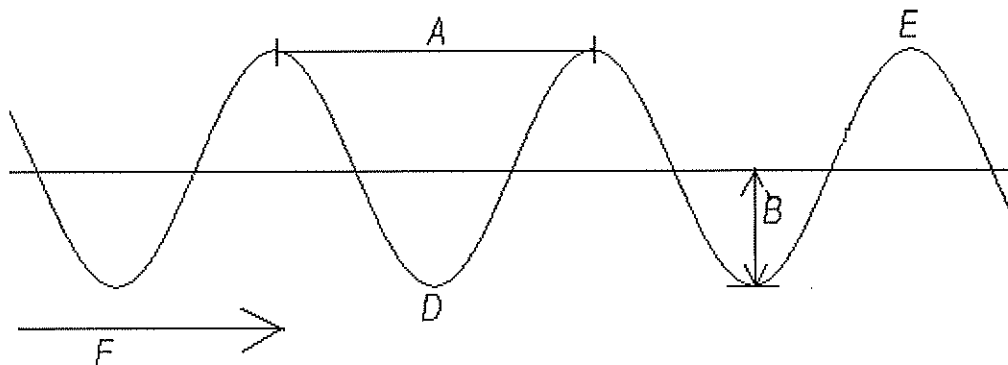
SECTION 2: WRITTEN

Write your answers on the lined paper provided.

1. Circle the correct values to complete this sentence: (2)

Sound waves travel through air at approximately 340 / 300 000 000 metres per second, whereas light (also called electromagnetic) waves travel through a vacuum at approximately 340 / 300 000 000 metres per second.

2. Study the following diagram of a wave, then answer the questions below: (5)



Which letter corresponds to each of the following?

- | | | | |
|---------------------------------|---|---------------|---|
| I. direction of energy transfer | F | IV. amplitude | B |
| II. crest | E | V. wavelength | A |
| III. trough | D | | |

3. Tom and Sally buy tickets for the House of Horrors at the Royal Show. Inside, the only lights are red and green. Tom is wearing blue jeans and a red jumper. Sally is wearing a yellow dress and black shoes. (4)

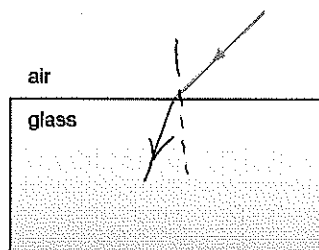
Describe how their clothes would appear using words such as “no colour” or type of colour (red, blue, yellow...) inside the House of Horrors in:

- a red light
b green light

	Blue jeans	Red jumper	Yellow dress	Black shoes
a) red light	Black	Red	Red	Black
b) green light	Black	Black	Green	Black

1/2 mark each

4. The diagram below shows a light ray travelling through air to the interface between the air and a glass block. (4)



- a. On the diagram, draw the **normal** and a possible path for the ray in the glass.
b. If the glass block were now to be replaced with denser glass of greater refractive index, what difference this would make to the path of the ray?

If the block were replaced with glass of higher refractive index, the light ray would bend closer towards the normal. The denser the glass, the closer the ray will bend to the normal.

5. a) Ivan makes a low sound of 55 Hz while talking to his friends. Calculate the wavelength of this sound. (2)

$$v = 340 \text{ m/s} \quad v = f\lambda \Rightarrow \lambda = \frac{v}{f} = \frac{340}{55} = 6.18 \text{ m}$$

$$f = 55 \text{ Hz}$$

$$\lambda = ?$$

- b) A radio station broadcasts radio waves that have a wavelength of 298 cm. What is its broadcast frequency? (3)

$$\lambda = 0.298 \text{ m} \quad v = f\lambda \Rightarrow f = \frac{v}{\lambda} = \frac{300000000}{0.298}$$

$$v = 300000000 \text{ m/s} \quad = 1006711409 \text{ Hz}$$

$$= 1.01 \times 10^9 \text{ Hz}$$

Formula you might need:
 $v = f \times \lambda$

END OF TEST (OUT OF 40 MARKS)

