

Q1. (a) (i) Describe how the vibrations of a sound wave are received by the outer ear and transmitted to the inner ear.

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(3)

(ii) Explain how the pressure changes due to the sound wave are amplified by the ear.

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(2)

(b) An intensity meter, set to the dB scale, measures the intensity level of a sound as 46 dB.
Calculate the intensity of the sound at the meter, giving an appropriate unit.

answer =

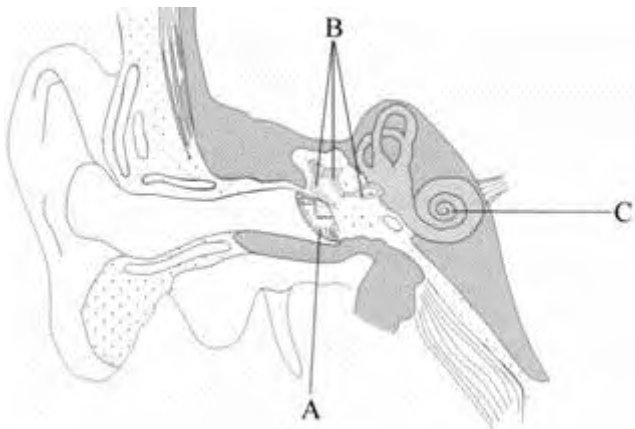
(3)

- (c) The scale on the intensity meter is changed to the dBA scale and the new reading, for the same sound, is found to be 50 dBA. Explain this change.

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(2)
(Total 10 marks)

Q2. The diagram shows a vertical section through a human ear.



- (a) Name and state the functions of the parts labelled A, B and C in the diagram.

A name

function

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B name

function

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C name
function
.....

(6)

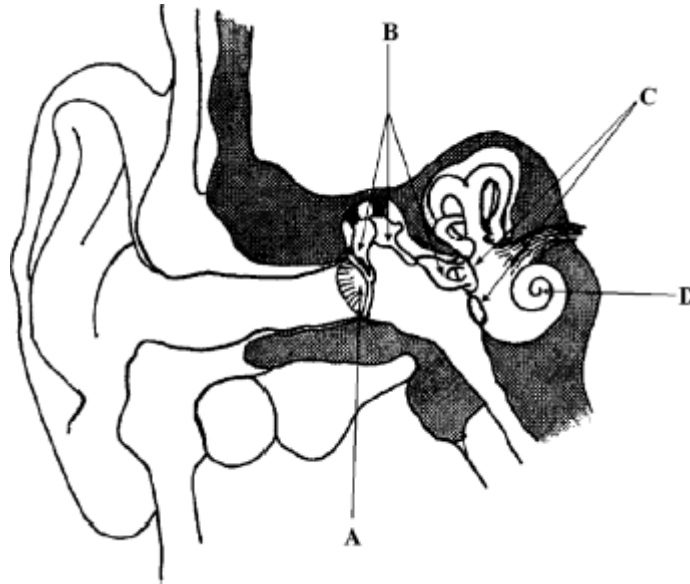
- (b) An ear has a threshold of hearing at a particular frequency at an intensity level of 42 dB. Calculate the intensity of sound incident on the ear.

$$I_0 = 1.0 \times 10^{-12} \text{ W m}^{-2}$$

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(2)
(Total 8 marks)

Q3. The diagram shows a vertical section through the human ear. Solid bone is shaded grey.



Name and state the function of the parts labelled A, B, C and D.

A name

function

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B name

function

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C name

function

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D name

function

.....

(Total 8 marks)