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.

Page 2

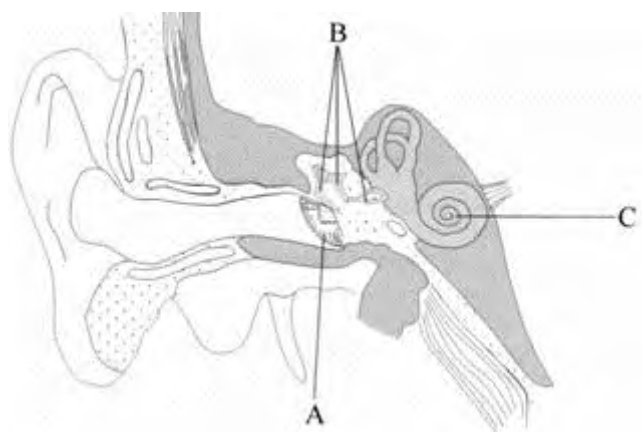answer = ...

(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 ....

....

Page 3

C   name ....

         function ....

         ....
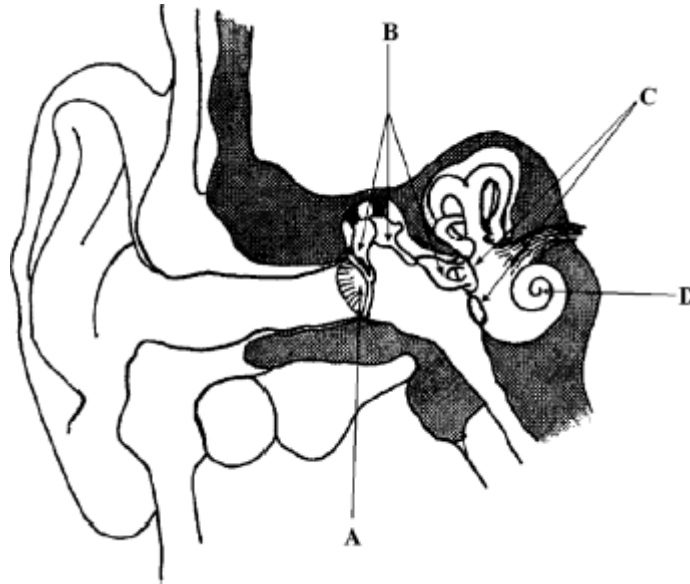
(6)

(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 ....

     ....

B   name ....

     function ....

     ....

C   name ....

     function ....

     ....

D   name ....

function ....

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