



QUESTION WORKBOOK

Brain imaging, development and learning

Nervous coordination, receptors and muscles · Unit B14

Edexcel A 8.9, 8.10, 8.11, 8.12, 8.13, 8.19

12 questions · 46 marks

PRINT EDITION

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SECTION A · Short, 1 to 2 marks**A1**

BI-Q1

Of CT, MRI, fMRI and PET, state which two expose the patient to ionising radiation, and the source of the radiation in each.

[2]

SECTION B · Standard, 3 to 5 marks**B1**

BI-Q9

When the siphon of the sea slug *Aplysia* is touched, it withdraws its gill, but after many repeated touches it withdraws the gill only weakly. Explain how this habituation happens at the synapse between the sensory neurone and the motor neurone.

[5]

B2

BI-Q11

Describe how you could investigate habituation to touch in a snail, including the variables you would control.

[5]

B3
BI-Q2

Explain how functional magnetic resonance imaging (fMRI) is used to find which regions of the brain are active while a person reads aloud. [4]

B4
BI-Q3

Compare computed tomography (CT) with magnetic resonance imaging (MRI) as ways of imaging the structure of the brain. [4]

B5
BI-Q13

Within hours of birth, babies turn their eyes and head further to follow a face-like pattern than to follow the same features scrambled. Evaluate the use of this evidence to conclude that the preference for faces is determined by nature. [4]

B6 Explain how studies of people with damaged brain areas are used to investigate brain function and development, and give two limitations of these studies. [4]
BI-Q14

B7 Describe how a positron emission tomography (PET) scan using labelled glucose shows which regions of the brain are most active. [3]
BI-Q4

B8 Explain why kittens and monkeys were used as animal models in research into the development of human vision. [3]
BI-Q7

B9 A snail has habituated to gentle touches on its head, but when it is touched much more firmly it withdraws its tentacles fully. Explain what this observation shows about habituation. [3]
BI-Q12

B10

BI-Q15

People brought up in surroundings with few straight edges and right-angled corners were found to be less easily taken in by the Müller-Lyer illusion. Suggest why this finding does not prove that the way we judge depth from lines is learned.

[3]

SECTION C · Long, 6 marks or more**C1**

BI-Q8

Discuss the use of animals in medical research from two ethical standpoints.

[6]

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