

The Human Nervous System

Mark Scheme

Level	GCSE (9-1)
Subject	Combined Science – Trilogy - Biology
Exam Board	AQA
Topic	4.5 Homeostasis and Response
Sub-Topic	The Human Nervous System
Difficulty Level	Gold Level
Booklet	Mark Scheme

Time Allowed: 40 minutes

Score: / 40

Percentage: /100

Grade Boundaries:

M1.(a) motor

allow efferent / postsynaptic
*allow **another** relay (neurone)*

1

(b) release of chemical (from relay neurone)

allow ecf for 'motor' neurone from (a)
allow release of neurotransmitter / named example

1

chemical crosses gap / junction / synapse

allow diffuses across
allow chemical moves to X

1

chemical attaches to X / motor / next neurone (causing impulse)

1

(c) (curare) decrease / no contraction

accept (muscle) relaxes

1

(strychnine) increase / more contraction

if no other mark awarded allow 1 mark for (curare) decrease
*/ no response **and** (strychnine) increase / more response*

1

[6]

M2.(a) A sensory (neurone)

ignore nerve

1

B motor (neurone)

ignore nerve

1

C spinal cord / central nervous system / white matter

accept grey matter

1

(b) by chemical / substance

allow transmitter

1

(c) muscle

allow extensor

ignore muscle names

1

[5]

M3. (a) *ignore nerve / neuron(e) throughout*

A sensory

accept afferent

1

B motor

accept efferent

1

C relay

accept intermediate

1

(b) stretch

allow pressure / pull / tension (in muscle)

*allow a hit at (point) **P***

ignore pain

1

(c) any **three** from:

- chemical (release)
accept neurotransmitter / acetylcholine
- diffuses (across the gap / synapse)
- transmits impulse / information (across synapse)
allow transmits signal / message
- between neurones / nerve cells / named
if named, must be either sensory / A to relay / C or relay / C to motor / B
allow 'to the next neurone'

3

[7]

M4. (a) (i) sensory / afferent

1

(ii) on diagram:

arrow (next to neurone **A**) pointing towards spinal cord
and
arrow (next to neurone **B**) pointing towards muscle

1

(b) chemical (released) **or** neurotransmitter
or by diffusion

accept correct named example of a neurotransmitter

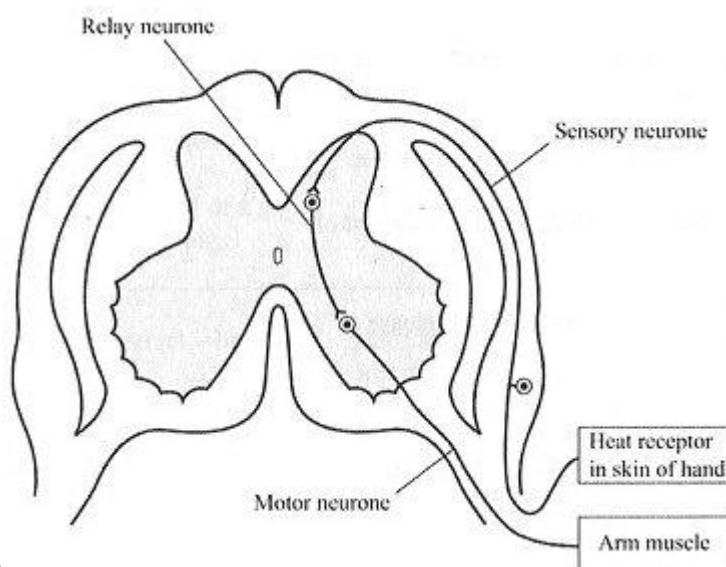
1

(c) on diagram:

X labelling muscle **or** motor end plate
*do **not** accept on stretch receptor*

1

[4]



M5. (a)

sensory neurone correctly drawn **and** labelled
*from receptor + via dorsal root + cell body in
 ganglion + synapse to relay neurone*

1

motor neurone correctly drawn **and** labelled
*to muscle + via ventral root + same shape as
 relay neurone + synapse with relay neurone*
OR correct pathways for both neurones given
*(ie without synapse or cell bodies) **and** labelled,*
or correctly drawn but unlabelled = 1 mark for this part)

1

(b) any **two** from:

reference to synapses / gaps between neurones

extra time for release / movement of chemical

extra time for development of muscle 'tone' / tension

2

[4]

M6. (a) receptors
for 1 mark

1

(b) electrical/nerve
signals/impulses
for 1 mark each

2

(c) muscle
for 1 mark

1

(d) correct description of:
stimulus
receptor
co-ordinator
effector
response
for 1 mark each

5

[9]

M7. (i) eyes as sense organs/detector/receptors in eye,
electrical signals (impulses),
to co-ordinator,
then to leg muscles/effector
for 1 mark each

4

(ii) affects the nervous system and slows down the reactions

for 1 mark

1

[5]