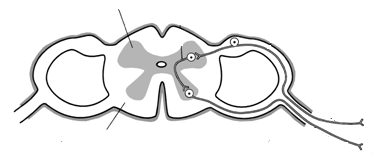
**Q 2015 14 b**



C

A

B

1. Name the parts labelled A, B and C in the diagram of the cross section of the spinal cord.
2. What is the main structural difference between A and B?
3. 1. What is the function of the meninges?

2. How many layers are present in the meninges?

1. Reflex actions are very important in animals.
   1. What is a reflex action?
   2. Outline the mechanism of a reflex action.

**MS 2015 14 b**

|  |  |  |
| --- | --- | --- |
| **14.** (b) | 1. A = \*grey matter B = \*white matter   C = \*central canal **or** \*cerebrospinal fluid (CSF)   1. *A:* consists (mainly) of cell bodies **or** (mostly) no myelin   *B:* consists (mainly) of axons **or** (mostly) myelin   1. 1. Protection (of CNS)    1. \*Three 2. 1. Automatic (or involuntary) response to a stimulus    1. Stimulus at receptor / (causes) impulse along sensory neuron / (impulse) through interneuron / (impulse) through   motor neuron / to effector (or muscle or gland) or effector reacts /  (another impulse is sent) to the brain. ***Any Two*** | **1** |
| **1** |
| **1** |
| **3** |
| **3** |
| **3** |
| **3** |
| **3** |
| **2(6)** |

**Q 2014 11 b**

Answer the following questions in relation to the human nervous system.

* 1. Name the **type** of particle whose movement in and out of neurons is an essential feature of nerve impulse transmission.
  2. One of the roles of the particles referred to in (i) is the activation of neurotransmitters.

(iii) Give an account of how neurotransmitters work.

1. Distinguish between the position of the cerebellum and the position of the cerebrum in the human brain.

2.State **three** functions of the cerebrum. **(27)**

© Read the following extract and then answer the questions below.

Alzheimer’s disease (a degenerative brain condition), like many other degenerative illnesses, is driven by genes and recently scientists have identified a group of genes that are thought to be associated with this disease. The disease is thought to be caused by a build up of protein-based plaques in the brain, and investigators now believe they have an understanding of ways to interrupt that process. Technology is helping too, as researchers exploit new ways to scan the brain and detect the first signs of trouble, peering deeper into human and animal neural tissue to pinpoint the very molecules that give rise to the disease.

(Adapted from *Alzheimer’s Unlocked,* TIME, Volume 176, No. 17. 2010.)

1. What do you think is meant by the term “degenerative illnesses”?
2. Is Alzheimer’s disease driven by a single gene or by many genes?
3. What is thought to cause the disease?
4. Suggest a possible symptom of Alzheimer’ disease.
5. How is the advance of technology helping in the fight against the disease?
6. There are probably more people suffering from the disease now than ever before. Suggest a reason for this.
7. Name another disorder of the nervous system **and** give a possible treatment for it. **(24**

**MS 2014 11 b**

|  |  |  |  |
| --- | --- | --- | --- |
| (i) | \*Ion |  | **3** |
| (ii) | (Neurotransmitters are) secreted by the neuron / into (or crosses) the | |  |
|  | synaptic cleft / react with receptors / (on) the next neuron / set up the | |  |
|  | impulse in this neuron / inactivated by enzymes / reabsorbed by | |  |
|  | (presynaptic neuron) | | **4(3)** |
| (iii) | 1. | The cerebellum – hind brain **and** cerebrum – forebrain | **3** |
|  | 2. | *Any three functions*: |  |
|  |  | memory / learning / emotion / speech / vision / intelligence / |  |
|  |  | movement / language / smell / hearing / logic / personality / taste | **3(3)** |
| (c)(i) | Getting worse | | **3** |
| (ii) | Many (or group) | | **3** |
| (iii) | A build up of protein plaques | | **3** |
| (iv) | e.g. memory loss | | **3** |
| (v) | Scans can examine the brain (for early detection) | | **3** |
| (vi) | Larger population **or** more people living into old age | | **3** |
| (vii) | Name / treatment | | **2(3)** |

**Q 2012 13**

(a) (i) Distinguish between the central nervous system and the peripheral nervous system. Include a clear reference to each in your answer.

(ii) Give one way in which a nervous response differs from a hormonal response. (9)

(b) (i) Draw a large labelled diagram of a motor neuron.

(ii) Give one function each of any two parts found only in neurons.

(iii) Place an arrow on or near your diagram to indicate the direction of impulse transmission.

(iv) Name and state the role of any two types of neuron, other than the motor neuron. (27)

(c) (i) State one function for each of the following parts of the human brain.

Cerebrum; Hypothalamus; Cerebellum; Medulla oblongata.

(ii) In relation to the nervous system, distinguish between grey matter and white matter. Include a clear reference to each in your answer.

(iii) In the case of either paralysis or Parkinson’s disease state:

1. a possible cause, other than accident;

2. a method of treatment. (24)

**MS 2012 13**

|  |  |
| --- | --- |
| **13.** (a) (i) CNS: brain and spinal cord | **3** |
| PNS: nerves leading to and from CNS **or** nerves not in CNS | **3** |
| (ii) Faster **or** shorter-lived **or** electrical | **3** |
|  |  |
| (b) (i) Diagram: cell body with dendrites + axon + terminal dendrites *shown*  Diagram of a sensory neuron gets 0 marks | **6, 3, 0** |
| Labels: Cell body / dendrites / axon / myelin sheath / Schwann cells / (neurotransmitter) vesicles (or swellings) | **6(1)** |
| (ii) Function first named part | **3** |
| Function of second named part | **3** |
| (iii) \*Arrow | **3** |
| (iv) Sensory neuron carry impulses to CNS (or to named part of CNS) | **3** |
| Interneuron carry impulses within CNS **or** Interneuron carry impulses |  |
| from sensory to motor neuron **or** connect sensory and motor neurons | **3** |
| (c) (i) *Cerebrum:* language **or** reason **or** consciousness **or** senses **or**  memory **or** intelligence **or** emotions **or** other  *Hypothalamus:* homeostasis **or** example of homeostasis **or**  endocrine function **or** other  *Cerebellum:* movement **or** balance **or** coordination **or** example  *Medulla oblongata:* involuntary muscle control **or** example | **3** |
| **3** |
| **3** |
| **3** |
| (ii) Grey: few axons **or** little myelin **or** mostly cell bodies | **3** |
| White: many axons **or** much myelin **or** few cell bodies | **3** |
| (iii) 1. Cause: Parkinson‟s – lack of dopamine **or** genetic **or** toxins  **OR**  Paralysis – damage to spinal cord **or** other | **3** |
| 2. Treatment: Parkinson‟s - levodopa **or** drugs that mimic dopamine  **or** physiotherapy **or** exercise **OR**  Paralysis – surgery **or** psysiotherapy | **3** |

**Q 2010 11 a and b**

(a) (i) Name a disorder of the human nervous system.

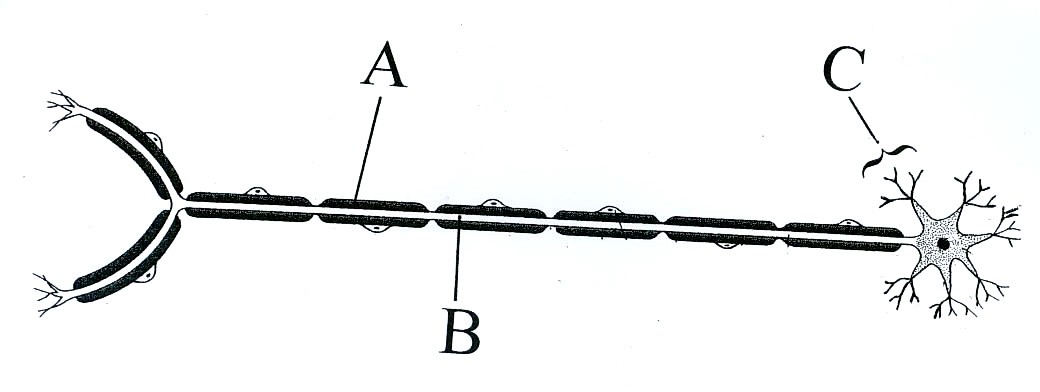
1. In the case of the disorder referred to in part (i) state:
   1. A possible cause.
   2. A means of prevention **or** a treatment. **(9)**
2. (i) What is a reflex action?
3. Give **one** example of a reflex action.
4. Suggest an advantage of reflex actions.
5. The parts of the nervous system involved in a reflex action make up a reflex arc.
   1. Draw a large labelled diagram to show the structures involved in a reflex arc.
   2. Place arrows on your diagram to show the direction of impulse transmission in the reflex arc. **(27)**

**MS 2010 11 a and b**

|  |  |  |  |
| --- | --- | --- | --- |
| (a) | (i) | Paralysis or Parkinson’s . . . | **3** |
|  | (ii) | 1. Relevant cause | **3** |
|  | 2. Relevant means of prevention or treatment | **3** |
|  |  |  |  |
| (b) | (i) | automatic / response to a stimulus / involuntary (or not controlled by brain)  ***Any two*** | **2(3)** |
|  | (ii) | e.g. coughing, blinking, sneezing etc. | **3** |
|  | (iii) | Protection **or** fast (response) | **3** |
|  | (iv) | 1. Diagram   (*sensory neuron, motor neuron, spinal cord and correct position of cell bodies for 6 marks*)  Labels:  *receptor* (*or named*), *sensory neuron, inter neuron,*  *motor neuron, cell body, effector* (*or named*) ***Any***  ***three***   1. Arrow in (dorsal) + arrow out (ventral) | **6, 3, 0** |
|  | **3(2)** |
|  | **3** |

**Q 2008 4**

The diagram shows a motor neuron.



(a) Identify parts A, B and C.

(b) Give a function of A

(c) Place an arrow on the diagram to show the direction of the impulse.

(d) Give a function of C

(e) Place an X on the diagram at a point at which a neurotransmitter substance is secreted.

(f) What is the role of the motor neuron?

**MS 2008 4**

|  |  |  |  |
| --- | --- | --- | --- |
| **4.** | (a) | A = myelin sheath **or** Schwann cell B = myelin sheath **or** axon C = dendrite | **3(1)** |
|  | (b) | A: (myelin sheath) insulates **or** protection **or** speeds up impulse **(message)** |  |
|  |  | A: (schwann cell) produces myelin (or sheath) **or** insulates **or** protection **or**  speeds up impulse **(message)** | **3** |
|  | (c) | arrow (right to left) **or** from dendrites towards cell body | **3** |
|  | (d) | receives impulse **or** carries impulse **(message)** to cell body | **3** |
|  | (e) | X on terminal dendrites on left | **3** |
|  | (f) | receive or carry impulse (message) **and** to muscle or gland or effector or from CNS | **5, 0** |

**Q 2006 14 b**

1. (i) What is a neuron?
2. Distinguish between sensory, motor and interneurons (association neurons).
3. Briefly explain the role of neurotransmitter substances.
4. State a function for 1. Schwann cells, 2. Myelin sheath.
5. In relation to Parkinson’s disease or paralysis give;
   1. A possible cause,
   2. A method of treatment.

**MS 2006 14 b**

|  |  |
| --- | --- |
| (i) nerve cell | **3** |
| (ii) *sensory*: towards CNS **or** named part **or** from receptor **or**  structural feature | **3** |
| *motor:* away from CNS **or** named part **or** to effector **or**  structural feature | **3** |
| *inter:* links two neurons | **3** |
| (iii) carries impulse / across synaptic cleft /  triggers impulse in next neuron *any two* | **2(3)** |
| (iv) *Schwann cell:* produces myelin (sheath) | **3** |
| *Myelin sheath*: insulation **or** protection **or** speeds impulse  (v) *Disorder:*  *Cause*: injury / genetic / disease / lack of dopamine / | **3**  **3** |
| *Treatment:* physiotherapy / stem cell / dopamine **or**  drugs qualified **3** |  |

**Q 2004 15a**

* 1. (i) Draw and label sufficient of two neurons to show a synaptic cleft.

1. Describe the sequence of events that allows an impulse to be transmitted across a synapse from one neuron to the next.
2. Suggest a possible role for a drug in relation to the events that you have outlined in (ii).

**MS 2004 15a**

1. **Diagram of synaptic cleft: 6, 3, 0 3 labels 3(2)**
2. **Transmission of impulse:** arrival of impulse / synaptic bulbs (or vesicles) /

**(**secretes) transmitter (substance) / passage of neurotransmitter /

impulse starts in next neuron / neurotransmitter broken down / by enzymes

***any five* 5(3)**

1. **A drug** may be used to inhibit **or** enhance transmission of impulse **or**

similar comment