

# 1.2 Overview of the Nervous System

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_ **Total: 12 marks**

**KEY WORDS** nervous system 神经系统 • sympathetic 交感 • somatic 躯体 • autonomic 自主  
• parasympathetic 副交感

## Objective

Build the skills to answer exam questions on the **nervous system** 神经系统 and the **endocrine system** 内分泌系统.

You must be able to:

- divide the nervous system into **central** 中枢 and **peripheral** 外周 parts
- distinguish the **somatic** 躯体 from the **autonomic** 自主 nervous system
- contrast **sympathetic** 交感 and **parasympathetic** 副交感 activation
- explain how the **endocrine system** differs from neural signalling

## 1 Worked examples

Study these first. Each one shows the method for a task used later.

### ■ The two main divisions

The **central nervous system** is the brain and spinal cord. The **peripheral nervous system** is everything else — the nerves carrying signals to and from the body.

### ■ Somatic and autonomic

The **somatic** division carries sensory information in and controls voluntary skeletal muscle. The **autonomic** division controls involuntary processes: heart rate, digestion, breathing rate.

### ■ Sympathetic against parasympathetic

The **sympathetic** branch mobilises the body — heart rate up, pupils dilated, digestion suppressed. The **parasympathetic** branch restores it — heart rate down, digestion resumed. They oppose each other, and a healthy body moves between them.

### ■ Hormones against neurotransmitters

Neural signals are fast and targeted: milliseconds, along a specific pathway. **Hormones** travel in the bloodstream, reach every tissue, act more slowly, and last longer.

## 2 Practice

**2.1** Name the two structures that make up the central nervous system. [2]

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**2.2** State one function of the somatic nervous system and one of the autonomic. [2]

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**2.3** A student is startled by a loud noise.

(a) State which autonomic branch is activated. [1]

(b) State two bodily changes that branch produces. [2]

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## 3 Exam-style questions

**3.1** Slowing of the heart after a stressful event is produced mainly by the [1]

- **A** sympathetic nervous system
- **B** parasympathetic nervous system
- **C** somatic nervous system
- **D** central nervous system

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**3.2** Compared with neural signalling, endocrine signalling is [1]

- **A** faster and more targeted
- **B** slower and more widespread
- **C** identical in speed
- **D** confined to the brain

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**3.3** A person's hand jerks back from a hot surface before they feel pain.

(a) State which division carries the motor command to the muscle. [1]

(b) Explain why the movement can occur before the brain registers pain. [2]

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## Solutions

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**2.1** the brain; the spinal cord.

**2.2** somatic: carries sensory information and controls voluntary skeletal muscle; autonomic: controls involuntary processes such as heart rate or digestion.

**2.3** (a) the sympathetic branch. (b) any two of: heart rate rises; pupils dilate; digestion is suppressed; breathing quickens.

**3.1 B.** the parasympathetic branch restores the body after arousal.

**3.2 B.** hormones travel in the bloodstream to every tissue and act over a longer period.

**3.3** (a) the somatic nervous system. (b) a reflex arc is completed in the spinal cord, so the motor command is issued before the signal reaches the brain for conscious processing.