

2.5 Storing Memories

Name: _____ Class: _____ Date: _____

Total: 18 marks

KEY WORDS serial position effect 系列位置效应 • episodic 情景 • semantic 语义
• consolidation 巩固 • long-term potentiation 长时程增强

Objective

Build the skills to answer exam questions on how memories are **stored** 储存.

You must be able to:

- distinguish **episodic** 情景 from **semantic** 语义 memory
- describe the role of the **hippocampus** 海马 and of the **cerebellum** 小脑
- explain **long-term potentiation** 长时程增强 in outline
- state what **consolidation** 巩固 is and when it happens

1 Worked examples

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

■ Episodic and semantic

Episodic memory stores personally experienced events, with a time and place. **Semantic** memory stores facts and general knowledge, usually without any memory of learning them.

■ Where storage depends

The **hippocampus** is essential for forming new explicit memories; damage prevents new learning while leaving old memories and skills intact. Skill memory depends more on the **cerebellum** and basal ganglia.

■ Long-term potentiation

Repeated stimulation of a neural connection makes it fire more readily afterwards. This strengthening of specific synapses is the leading physical account of how a memory is stored.

■ Consolidation

A new memory is initially fragile and becomes stable over hours and days, a process supported by sleep. Interference or injury during this window disrupts the memory more than it would later.

2 Practice

2.1 State the difference between episodic and semantic memory, with an example of each. [2]

2.2 Explain what long-term potentiation describes. [2]

2.3 A patient with hippocampal damage learns a new motor skill but cannot remember practising it.

(a) State which structure supports the skill learning. [1]

(b) State what this dissociation shows. [1]

3 Exam-style questions

3.1 Knowing that Paris is the capital of France without recalling learning it is [1]

- | | |
|---|---|
| A | B |
| C | D |
- A** episodic memory
 - B** semantic memory
 - C** implicit memory
 - D** sensory memory

3.2 A head injury erases memories of the hour before it but not of the previous year. This is best explained by [1]

- | | |
|---|---|
| A | B |
| C | D |
- A** retrieval failure
 - B** disrupted consolidation
 - C** the spacing effect
 - D** proactive interference

3.3 Sleep after study improves recall.

- (a) Name the process this supports. [1]
- (b) Explain why the improvement is greater than for equal time awake. [2]

3.4 Applied research task. Students learned a 30-item word list. Group A studied it for 40 minutes in one sitting. Group B studied it for 10 minutes on each of four days. Both groups were tested a week later. Group B recalled far more. Within both groups, words from the start and the end of the list were recalled better than words from the middle.

- (a) Name the effect that explains Group B's advantage, and explain why it works. [2]

- (b) Name the effect shown by the position of the words in the list, and name its two parts. [2]

- (c) Explain the two parts using the multi-store model of memory. [2]

- (d) A student concludes "the best way to study is always to space it out". State **one** limitation of drawing that conclusion from this study. [1]
