UNIT 8. THE HUMAN BRAIN AND ITS FUNCTIONS

1. Read and translate the key words.

1. temporal lobe
2. frontal lobe
3. occipital lobe
4. auditory cortex
5. hemisphere
6. amygdala
7. brainstem
8. thalamus
9. limbic system
10. to expose
11. consonant
12. neuroscientist
13. rotate
14. dissonant
15. insight
16. repress
17. mature
18. neuromodulator
19. neurotransmitter
20. wire
21. intuition
22. relax
23. unique
24. insomnia
25. to disappear
26. dominant
27. medulla
28. hypothalamus
29. pituitary gland

2. Read the text and decide whether the statements below are TRUE or FALSE.

Anatomy of the Human Brain

The largest part of the human brain is the cerebrum, which is divided into two hemispheres. Underneath lies the brainstem, and behind that sits the cerebellum. The outermost layer of the cerebrum is the cerebral cortex, which consists of four lobes: the frontal lobe, the parietal lobe, the temporal lobe and the occipital lobe.

Like all vertebrate brains, the human brain develops from three sections known as the forebrain, midbrain and hindbrain. Each of these contains fluid-filled cavities called ventricles. The forebrain develops into the cerebrum and underlying structures; the midbrain becomes part of the brainstem; and the hindbrain gives rise to regions of the brainstem and the cerebellum.

The cerebral cortex is greatly enlarged in human brains, and is considered the seat of complex thought. Visual processing takes place in the occipital lobe, near the back of the skull. The temporal lobe processes sound and language, and includes the hippocampus and amygdala, which play roles in memory and emotion, respectively. The parietal lobe integrates input from different senses and is important for spatial orientation and navigation.

The brainstem connects to the spinal cord and consists of the medulla oblongata, pons and midbrain. The primary functions of the brainstem include: relaying information between the brain and the body; supplying some of the cranial nerves to the face and head; and performing critical functions in controlling the heart, breathing and consciousness.

Between the cerebrum and brainstem lie the thalamus and hypothalamus. The thalamus relays sensory and motor signals to the cortex and is involved in regulating consciousness, sleep and alertness. The hypothalamus connects the nervous system to the endocrine system – where hormones are produced – via the pituitary gland.

The cerebellum lies beneath the cerebrum and has important functions in motor control. It plays a role in coordination and balance, and may also have some cognitive functions.

1. The smallest part of the human brain is the cerebrum.
2. Cerebrum is divided into two hemispheres.
3. The human brain develops from four sections.
4. Visual processing takes place in the occipital lobe.
5. The hypothalamus connects the nervous system to the endocrine system via the pituitary gland.

3. Match the terms (1–6) with their definitions (a–f).

1. Brain
2. Neuron
3. Process
4. White matter
5. Gray matter
6. Sensory information

a) information that comes from the sense organs
b) the organ in the body responsible for thinking
c) to take in and understand something
d) a part of the CNS that does not contain nerve cell bodies
e) a nerve cell
f) a part of the CNS that contains nerve cell bodies

4. Read the text and decide whether the statements below are TRUE or FALSE.

The Best Way to Keep Your Brain Younger

The brain is particularly sensitive during the middle years. The brains of obese individuals are physiologically 10 years older than

lean individuals, new research finds. Scientists looked at the brain's white matter. The white matter is the tissue that connects the areas and enables them to communicate with each other. Dr. Lisa Ronan, first author of this study, said: "As our brains age, they naturally shrink in size, but it isn't clear why people who are overweight have a greater reduction in the amount of white matter. We can only speculate on whether obesity might in some way cause these changes or whether obesity is a consequence of brain changes". The study looked at the brains of 473 people aged between 20 and 87. Overweight individuals had significantly less white matter in their brains than lean individuals. The differences were only seen from middle-age onwards. Professor Paul Fletcher, senior author of the study, added: "We're living in an ageing population, with increasing levels of obesity, so it's essential that we establish how these two factors might interact, since the consequences for health are potentially serious. The fact that we only saw these differences from middle-age onwards raises the possibility that we may be particularly vulnerable at this age. It will also be important to find out whether these changes could be reversible with weight loss, which may well be the case". Professor Sadaf Farooqi, co-author of the study, said: "We don't yet know the implications of these changes in brain structure. Clearly, this must be a starting point for us to explore in more depth the effects of weight, diet and exercise on the brain and memory".

1. The brain is particularly sensitive during the young years.

2. The white matter is the tissue that connects the areas and enables them to communicate with each other.

3. It is clear why people who are overweight have a greater reduction in the amount of white matter.

4. We're living in an ageing population.

5. The brains of obese individuals are physiologically 10 years older than lean individuals.

5. Find English equivalents in the text for the following words:

товстий/ожирілий; худорлявий; скорочуватися; зменшення; міркувати; наслідки; уразливий; оборотний; об'єм; нестача; здібність

6. Is there a direct dependence of cognitive abilities on the people's weight according to the article?

7. What is your opinion of the article?