1. During testing of a patient with a prior history of head trauma, you ask him to draw as many figures of different shapes as he can in 2 minutes. When you examine his paper, you note that all his figures look quite similar. You then ask him to copy rows of repeating figures. During the third task, you realize that he has reverted to copying the first row and not the third. Which frontal zone do you suspect to be the most affected?

   A. Premotor  
   B. Frontal Eye Field  
   C. Dorsolateral  
   D. Orbitofrontal  
   E. Primary Motor

2. Apathy and akinetic mutism are symptoms of which frontal zone dysfunction?

   A. Frontal Eye Field  
   B. Primary Motor  
   C. Premotor  
   D. Cingulate/SMA  
   E. Orbitofrontal

3. Alogia, blunted affect, avolition, and anhedonia likely represent the following abnormality seen in schizophrenia:

   A. Decreased mesocortical DA activity  
   B. Global decrease in DA activity  
   C. Decreased blood flow to basal ganglia  
   D. Increased mesolimbic DA activity  
   E. Decreased hypothalamic DA activity

4. Frontal type dementia differs from Alzheimer’s disease in that in frontal-type dementia, patients have frank amnesia and late behavioral changes.

   A. True  
   B. False
5. Dysfunction of orbital frontal zones is characterized by all of the following EXCEPT:

A. Poor visual search  
B. Anosmia  
C. Confabulation  
D. Disinhibition  

6. Typical antipsychotic drugs can potentially induce severe motor side effects primarily because of their action on D2 receptors that are present in dopaminergic projections to the limbic system and the striatum.

A. True  
B. False  

7. In fronto-subcortical circuits that mediate complex behaviors, projections from the frontal cortex to the basal ganglia then project to this structure before returning to the frontal cortex.

A. Hippocampus  
B. Association cortex  
C. Nucleus accumbens  
D. Midbrain  
E. Thalamus  

8. Damage to the frontal-subcortical circuits can result in behavioral dysregulation as seen in various diseases. In OCD, there appears to be decreased activity in frontal-subcortical circuits involved in impulse regulation.

A. True  
B. False  

Name the white matter tract that best corresponds to the following descriptions:

9. Tract that carries information to the mammillary bodies from the hippocampus  
10. Tract that carries information from the amygdala to the septal nucleus  
11. Tract that carries information from amygdala to the hypothalamus and brainstem  
12. Tract that carries information from the anterior cingulate gyrus back to the hippocampus  

A. cingulum bundle  
B. stria terminalis  
C. anterior commissure  
D. ventral amygdalofugal pathway  
E. fornix
13. What type of imaging is shown above?

A. T1 weighted MRI
B. T2 weighted MRI
C. CT scan
D. FLAIR image
E. PET scan

14. The abnormality above can be best described as a:

A. A wedge-shaped hypodensity of the right frontal lobe
B. A wedge-shaped hypodensity of the left frontal lobe
C. A wedge-shaped hyperdensity of the right frontal lobe
D. A wedge-shaped hyperdensity of the left frontal lobe
E. A lacunar infarct

15. After reviewing her imaging, you astutely suggest to your attending that her lack of motivation and drive is most likely secondary to a lesion in which of the following areas?

A. Orbifrontal cortex
B. Primary sensory cortex
C. Primary motor cortex
D. Anterior Cingulate cortex
E. Premotor cortex
58 year old man is brought in by his wife who complains that her husband "has not been acting like himself" for the past year.

16. What type of imaging is shown here?

   A. T2-weighted MRI  
   B. T1-weighted MRI  
   C. CT without contrast  
   D. CT with contrast  
   E. PET scan

17. The above findings are most characteristics of which disease process?

   A. Alzheimer's disease  
   B. Pick's disease  
   C. OCD  
   D. Parkinson's disease  
   E. Wernicke-Korsakoff syndrome

18. Symptoms that are most likely associated with these findings on neuroimaging include:

   A. Dystonia and shuffling gait  
   B. Obsessions and compulsions  
   C. Panic attacks and hyperorality  
   D. Personality changes and disinhibited behavior  
   E. Impaired skill-learning

4
19. Mammillary bodies möchten durch Thiaminmangel befallen
20. Locus ceruleus: essentiell in der Formation episodischer Erinnerung
21. Hippocampus: degeneriert in Parkinson's Krankheit
22. Substantia nigra: noradrenerge Zellkörper
23. Head of caudate nucleus: degeneriert in Huntington's Krankheit

24. Norepinephrin spielt eine wichtige Rolle in folgendem AUSSCHLIESSLICH:
   A. Huntington's Krankheit
   B. Angst
   C. Depression
   D. Wachheitshaltung
   E. Anlauf des Schlafs

25. Implantation von L-Tryptophan erhöht die Konzentration von welcher Substanz im Gehirn
   A. Acetylcholin
   B. Serotonin
   C. Domapine
   D. GABA
   E. Serotonin

26. Der Schlüsselwirkung von welcher Transmitter direkten Zusammenhang mit der Öffnung einer Chloridkanal
   A. Serotonin
   B. Norepinephrin
   C. Glutamat
   D. GABA
   E. Dopamin

27. Welches der folgenden ist ein Beispiel einer Verspannung?
   A. Überschwengliche, ritualisierte Händewaschung
   B. Wiederholte Überlegungen über Kontaminationen
   C. Angst vor einer Katastrophe
   D. Sorge um Symmetrie und Ordnung
   E. Angst, sich selbst zu schädigen

29. Atypical neuroleptics differ from typical neuroleptics because atypicals cause:
   A. Low potency blockade of D2 receptors and blockade of serotonin receptors
   B. High potency blockade of D2 receptors
   C. High potency blockade of D2 receptors and blockade of serotonin receptors
   D. Low potency blockade of D2 receptors and agonism at serotonin receptors
   E. None of the above

30. Which pair does not fit in the treatment of neuropsychiatric disorders?
   A. Parkinson's disease-dopamine agonist
   B. Depression-serotonin reuptake inhibitor
   C. Alzheimer's disease-acetylcholinesterase inhibitor
   D. Schizophrenia-dopamine agonist
   E. Epilepsy-GABA agonist

31. What is the structure by the arrow?
   A. Third ventricle
   B. Mammillary bodies
   C. Quadrigeminal cistern
   D. Fourth ventricle
   E. Substantia nigra
32. What structure is located by the arrow?

- A. Anterior nucleus of the thalamus
- B. Amygdala
- C. Substantia nigra
- D. Hippocampus
- E. Cerebellar vermis

33. What structure is located by the arrow?

- A. Amygdala
- B. Temporal horn of the lateral ventricle
- C. Occipital horn of the lateral ventricle
- D. Substantia nigra
- E. Fornix
34. What is the structure located by the arrow?

A. Amygdala
B. Entorhinal cortex
C. Fornix
D. Temporal horn
E. Head of the caudate nucleus

35. Which patient is more likely to have early Alzheimer's disease?
36. Which description best describes the abnormality in this contrast CT?

A. Medium sized low density ring surrounded by a large area of high density
B. Medium sized, bright ring-enhancing lesion surrounded by a large area of low signal

37. In an HIV + patient this lesion is most likely represents a
A. Tumor
B. Abscess
C. Meningioma
D. Hemorrhage
E. Aneurysm

38. This patient with mild Alzheimer’s disease is coming in to talk to the class this afternoon. The lateral ventricles on her MRI scan are:

A. Normal
B. Mildly enlarged
C. Moderately enlarged
D. Severely enlarged

39. Which of the following is not consistent with the imaging appearance of NPH?
A. Ventricular enlargement greater than cortical atrophy
B. High signal rimming the ventricles on FLAIR imaging
C. Cortical atrophy greater than ventricular enlargement
D. Bowing of the corpus callosum
<table>
<thead>
<tr>
<th>Objective</th>
<th>Points</th>
<th>%</th>
<th>Response</th>
<th>Student Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSWER_KEY 1</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 2</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 3</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 4</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 5</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 6</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 7</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>E</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 8</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 9</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>E</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 10</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 11</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 12</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 13</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 14</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 15</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 16</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 17</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 18</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 19</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 20</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 21</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 22</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 23</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>E</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 24</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 25</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 26</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 27</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 28</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 29</td>
<td>0.00 of 1.00</td>
<td>0.00</td>
<td>D [A]</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 30</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 31</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 32</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 33</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 34</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 35</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 36</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 37</td>
<td>1.00 of 1.00</td>
<td>100.00</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 38</td>
<td>0.00 of 1.00</td>
<td>0.00</td>
<td>D [C]</td>
<td></td>
</tr>
<tr>
<td>ANSWER_KEY 39</td>
<td>0.00 of 1.00</td>
<td>0.00</td>
<td>A [C]</td>
<td></td>
</tr>
</tbody>
</table>

**SUMMARY:**

36.00 of 39.00  92.31 -