MCQ exam

Mark your answers on the answer sheet (page 2 of the second document)

1. **Among these statements about Attention Deficit Hyperactivity Disorder (ADHD) which are the correct answers?**
   a) The prevalence of ADHD is 1% of the general population in France.
   b) ADHD affects girls more than boys.
   c) It is part of Neurodevelopmental Disorders.
   d) Impulsivity and hyperactivity are part of the core symptoms
   e) Can be present during adulthood

2. **Among these disorders, which are part of Neurodevelopmental Disorders (NDD):**
   a) OCD - Obsessive Compulsive Disorders
   b) Intellectual Developmental Disorder
   c) Tourette Syndrome
   d) Down Syndrome
   e) Developmental Learning Disorder

3. **Among these statements regarding executive function difficulties in ADHD, which ones are correct?**
   a) Inhibition is the most frequently affected function.
   b) The structures of the temporal cortex are particularly involved.
   c) Executive dysfunctions (EF) may affect social behavior.
   d) Emotion self regulation is part of executive functions.
   e) Sensory integration is part of executive functions.

4. **The POSNER model of attention characterizes several systems, what are they?**
   a) Brain stem and limbic system
   b) Sensorimotor network system
   c) Attention regulator system
   d) Posterior network
   e) Anterior network

5. **Among these statements regarding neurological dysfunctions in ADHD, which ones are correct?**
   a) A default mode neural network (DMN) dysfunction may be involved
   b) A ventral-striatal reward system dysfunction may be involved
   c) Salience Network Dysregulation may be involved
   d) The peak of thickness of the prefrontal cortex may be delayed
   e) An hyperactivation of the mirror neuron system (MNS) in cognitive activities may be involved

6. **What are the main principles for managing ADHD?**
   a) Pharmacological treatment with NA derivatives
   b) Psychotherapy and remediations
   c) School accommodations
   d) Parental therapies and psychoeducation
   e) rTMS

7. **Large human cohort studies have shown that several factors/pathological conditions are associated with chronic low-grade inflammation, including:**
   a) Childhood trauma
   b) Physical inactivity
   c) Aging
   d) Obesity
   e) Tabacco use

8. **In medically ill patients treated with interferon-alpha, inflammation and related IDO activation were associated with the severity of depressive symptoms, including:**
   a) Depressed mood
   b) Anxiety
   c) Delusional thoughts
   d) Cognitive impairment
   e) Sedation

9. **In depressed patients, inflammation and related IDO activation were associated with several biological abnormalities, including:**
   a) Lowered peripheral concentrations of serotonin
   b) Enhanced peripheral concentrations of tryptophan
   c) Enhanced peripheral concentrations of tyrosine
   d) Lowered peripheral concentrations of kynurenic acid
   e) Lowered peripheral concentrations of glutamate

10. **In medically ill patients treated with interferon-alpha, inflammation and related GTP-CH1 deregulation were associated with several biological abnormalities, including:**
   a) Lowered CSF concentrations of BH4
   b) Enhanced CSF concentrations of BH4
   c) Lowered CSF concentrations of dopamine
   d) Enhanced CSF concentrations of HVA
   e) Enhanced peripheral tyrosine/phenylalanine ratio

11. **In depressed patients, inflammation was associated with increased brain concentrations of glutamate, which were correlated with the severity of depressive symptoms, including:**
   a) Anhedonia
   b) Suicidality
   c) Motor retardation
   d) Sleep disturbances
   e) Interpersonal sensitivity

12. **Post-concussive symptoms from traumatic brain injuries are characterized by their heterogeneity in expression. The factors that induce this heterogeneity include:**
    a) The diversity of the primary injuries
    b) The intake of headache medication
    c) Susceptibility factors such as sex or age
    d) The intensity of the primary injury
    e) The Glasgow coma scale score at admission

13. **Traumatic brain injury severity is evaluated in clinics with the Glasgow Coma Scale. The mild traumatic brain injuries present a score between:**
    a) 3-8
    b) 0-3
    c) 13-15
    d) 9-12
    e) 3-12

14. **Patients with a Glasgow coma scale of 3 are likely to present at admission:**
    a) A hyperactive state
    b) Cerebral hemorrhages
    c) An increased intracerebral blood pressure
    d) Diffuse axonal injuries
    e) Neurodegenerative landmarks

15. **In the case of mild traumatic brain injuries:**
    a) Craniotomy is the most efficient action limiting the negative long-term outcomes
    b) No long-term negative outcome will be expected in young boys
    c) Executive dysfunction might be experienced 3 months or more after injury
    d) Neurodegenerative landmarks at admission can be found
    e) Diffuse axonal injury might occur

16. **Which of the following groups would represent good control groups in a model of mild juvenile repeated traumatic brain injury?**
    a) Littermates naïve to any manipulation
    b) Littermates with the same procedure to the exception of impacts
    c) Littermates with the same procedure to the exception of anesthesia and impacts
    d) Littermates with the same procedure with a single impact calibrated to the sum of all impacts
    e) Littermates with the same procedure with no impact except for the last repetition

17. **Traumatic brain injury is a mechanical insult, primary injury, on the head affecting the brain tissue. It is followed by a cascade of events which are named secondary injuries. Please indicate which ones are parts of the secondary events:**
    a) Hemorrhages
    b) Astrocytic alterations
    c) Neuroexcitation
    d) Calcium deregulation
    e) Skull fracture

18. Among the following propositions, select the correct item(s)

a) The striatum corresponds to a cortical area.
b) The GPi is considered as the main output door from basal ganglia.
c) The striatum is the only input door from the cortical motor cortices to basal ganglia.
d) The motor thalamus is involved in the cortico-sub cortico-cortical motor loops.
e) The thalamo-cortical pathway is GABAergic.

19. Among the following propositions, select the correct item(s)

a) The direct striato-pallidal pathway connects the striatum to the GPe.
b) The indirect striato-pallidal pathway connects the striatum to the GPe.
c) The hyper-direct pathway connects the cortex to the GPi.
d) The hyper-direct pathway inhibits the movement during its execution.
e) The STN belongs to the indirect striato-pallidal pathway.

20. Among the following propositions, select the correct item(s)

a) Parkinson's disease (PD) is related to the degeneration of the substantia nigra pars ~~reticulata~~ neurons.
b) Resting tremor is systematically present during PD.
c) Dystonia is considered as a hypokinetic syndrome.
d) Gait disturbance can be observed during PD.
e) Akinesia is one of the cardinal symptoms of PD.

21. Among the following propositions, select the correct proposition(s)

a) During levodopa-induced dyskinesia (LID), there is a decrease of GPi neurons activity.
b) During levodopa-induced dyskinesia (LID), there is an increase of GPi neurons activity.
c) A bursting activity is frequently observed within the STN in the absence of levodopa.
d) During akinesia, there is an overactivity of the pallido-thalamic pathway.
e) During levodopa-induced dyskinesia (LID), there is an increased activity of the thalamo-cortical pathway.

22. Among the following propositions, select the correct proposition(s)

a) During resting tremor, it could exist a coherence between the motor thalamus and the peripheral tremor.
b) A dysfunction of the pedunculopontine nucleus (PPN) could explain the rigidity observed in Parkinson's disease (PD).
c) Resting tremor seems to be related to A8 neurons degeneration.
d) Oscillation in the delta band as been recorded in the STN of akinetic patients with PD.
e) Deep brain stimulation of the VIM (motor thalamus) is the gold standard in functional neurosurgery to reduce all motor symptoms of Parkinson's disease.

23. Among the following propositions, select the correct proposition(s):

a) L-Dopa induces a stable improvement of motor symptoms in all the stages of Parkinson's disease
b) Deep brain stimulation of the subthalamic nucleus leads to an improvement of motor symptoms accompanied by dyskinesias
c) Deep brain stimulation of the subthalamic nucleus improves the motor symptoms by inhibiting the majority of subthalamic neurons
d) Deep brain stimulation of the subthalamic nucleus increases the tissue level of glutamate in the pars reticulata of substantia nigra of 6-OHDA rats
e) Deep brain stimulation of the subthalamic nucleus decreases the neuronal activity of the pars reticulata of substantia nigra of 6-OHDA rats

24. Among the following propositions, select the correct proposition(s):

a) In the striatum, dopamine D1 receptors are located on the projection neurons of the indirect pathway
b) Dopamine D2 receptors of the striatum are located on the projection neurons of the direct pathway
c) Activation of dopamine D1 receptors exerts an excitatory effect on striatal projection neurons
d) Activation of dopamine D2 receptors exerts an excitatory effect on striatal projection neurons
e) The D1 and D5 receptors belong to the same family of dopaminergic receptors

25. Ontogenesis

a) Innate behaviors are ~~numerous~~ in infants.
b) All our behaviors are based on a strong genetic foundation.
c) Repetition of movements enables procedural learning.
d) Most behaviors in infants are reflexive in origin.
e) The development of a child is accompanied by significant development of intra-cerebral connections.

26. Motor Cortex (Somatotopy):

a) Is located behind the Rolandic sulcus.
b) Occupies a large surface area of the cortex.
c) The region for the hand is situated in the lateral part.
d) The representation of the lower limbs is greater than that of the hand.
e) The representation of the lower limbs is located behind the supplementary motor area.

27. The Pyramidal Tract

a) In the brain, it passes between the basal ganglia.
b) Its fibers converge at the level of the internal capsule.
c) It occupies the dorsal part of the medulla oblongata.
d) There are terminations in the ventral horn of the spinal cord.
e) There are terminations in the dorsal horn of the spinal cord.

28. Basal Ganglia (Functional Anatomy):

a) The striatum plays a role in controlling our behavioral habits.
b) The striatum includes the caudate nucleus, putamen, and globus pallidus.
c) The subthalamic nucleus is part of the lenticular nucleus.
d) The substantia nigra is located in the midbrain.
e) Dopaminergic projections from the substantia nigra originate from the pars compacta.

29. Pre-Motor Cortex:

a) The supplementary motor area occupies the lateral part of the pre-motor cortex.
b) The supplementary motor area plays a role in the spatial and temporal planning of movement.
c) Lesions in the supplementary motor area can lead to bradykinesia.
d) Lesions in the lateral pre-motor cortex can result in language disorders.
e) Mirror neurons are found in the lateral pre-motor cortex.

30. The prefrontal cortex encompasses different regions :

a) A premotor region
b) A temporal region
c) An orbitofrontal region
d) A cingulate region
e) A premotor region

31. The dorsolateral prefrontal cortex is concerned with tasks that require:

a) Long-term memory
b) Short-term memory
c) Procedural memory
d) Consciousness of information processing
e) Neural mechanisms of praxis

32. Working memory involves:

a) A phonological loop
b) A visual sketchpad
c) Auditory information processing
d) The anterior cingulate cortex
e) A central executive system

33. The orbitofrontal cortex is involved

a) in motivational aspects of behavior
b) in socialization
c) in cognitive flexibility
d) in decision-making
e) in contest-dependent-behaviour

34. The anterior cingulate cortex

a) Has a cognitive and an affective part
b) Plays a role in explicit memory
c) Its lesion could induce visual troubles
d) Plays a role in attentional processes
e) Is involved in the pathophysiology of Tourette'syndrome

35. Which of the following is NOT one of the four defined zones within the epileptogenic zone framework?

a) Irritative zone
b) Symptomatogenic zone
c) Functional deficit zone
d) Cortical synchronization zone
e) Initiation zone

36. Which of the following techniques are used to analyze connectivity in the epileptogenic zone?

a) Electroencephalogram (EEG)
b) Functional MRI (fMRI)
c) Stereo-electroencephalography (SEEG)
d) Genetic testing
e) Behavioral observation alone

37. Which factors contribute to defining an epileptic syndrome? (Select all that apply)

a) Age at onset
b) Type of seizures
c) Neuropsychological evolution
d) Cortical thickness
e) EEG characteristics

38. In the context of comorbidities, what are common neuropsychiatric impacts of epilepsy? (Select all that apply)

a) Increased risk of depression
b) Improved memory retention
c) Higher incidence of anxiety
d) Lower intelligence quotient (IQ)
e) Increased risk of suicide